BIM Ireland's Seafood Development Agency

EAFE 2017

XXIII Conference of the European Association of Fisheries Economists
Dublin Castle, April 25 – 27, 2017

Agriculture, Food and the Marine
Talmhaíochta, Bia agus Mara

European Commission

Fáilte Ireland
National Tourism Development Authority

Hosted by the Fisheries Economics Group of Bord Iascaigh Mhara, the Irish Sea Fisheries Board, the conference is intended to provide a forum for the dissemination of recent advances in capture fisheries and aquaculture economics and management to promote discussion amongst researchers, managers, policy makers and other stakeholders in the fisheries sector.

The conference intends to assess the socio-economic impact of the initial introduction of management measures from the most recent Common Fishery Policy (CFP) in order to find examples of best-practice in adapting to the new institutional setting within EU fisheries.

EAFE Welcome

Dear EAFE Members,

Welcome to the XXIII Conference of the European Association of Fisheries Economists (EAFE).

Eighteen years ago, in April 1999, I attended my second EAFE Conference held here at Dublin Castle.

At the time, I was around 18 years old, and one of the keynote speeches was given by Professor Ragnar Arnason on the "Costs of Fisheries Management: Theoretical and Practical Implications". During this 1999 Conference, our current EAFE Vice-President, Erik Lindebo, gave a talk on "A Review of the Fishing Capacity Concept". Since that time some things have changed and others remain the same!

On behalf of our Association and its Bureau, I would like to welcome you all warmly to our XXIII Conference!

As you can see from the program and this book of abstract, the agenda is rather stimulating and busy with over 100 oral presentations and 15 posters, making the 2017 EAFE Conference one of the larger ever organised. So please, to allow for the smooth running of the Conference, respect the timing of the session and the 15 minutes slots, which might be challenging for some of our long-time Members.

While many of you are regular attendees, we also have the pleasure of welcoming newcomers from around the globe. So please, be open and friendly as you can be with them.

Let me also thank the organising committee (Emmet Jackson, Deirdre Moore, Richard Curtin, Michael Keatinge - Bord Iascaigh Mhara), as well as the Scientific Committee (Richard Curtin and Emmet Jackson - BIM ; Leyre Goti -Thünen Institute of Sea Fisheries; Bertrand Le Gallic - Université de Bretagne Occidentale, Raúl Prellezo - AZTI-Tecnalia and Maria Cozzolino - NISEA) for their hard work and investment. Also a big thank you to Simkje Kruiderink, from the European Commission, who coordinated the Special Sessions sponsored by DG MARE.

Last but not least, if you have appealing suggestions for the location of EAFE 2019, preferably in the South / East of Europe, please don't restrain yourselves and share your ideas with the Bureau Members (Bertrand, Erik, Raul, Hans, Jesper, Simkje, Dario and Leyre; www.umr-amure.fr/eafe/html/page_bureau.php).

Bonne Conférence à toutes à à tous.

Bertrand Le Gallic
EAFE President

BIM Welcome

Dear EAFE Conference Delegates,

I am delighted to extend a warm welcome to Dublin on behalf of Bord Iascaigh Mhara's (BIM's), the Irish Seafood Development Agency, and to say how delighted we are that you have chosen to have your conference here in Ireland 18 years after its last visit. Céad míle fáilte, a hundred thousand welcomes to each of you.

I would also like to express our thanks and gratitude to the Department of Agriculture Food and Marine, to the European Commission (DG-MARE) and to Fáilte Ireland for sponsoring this conference. Finally, to the to all the staff at Dublin Castle, a sincere thank you for your help in making our gathering run so smoothly.

Personally, I find it most heartening that EAFE's XXIII includes representatives from right across the seafood sector; fishermen, policy makers, scientists and government officials. Whatever your area or specialisation, each of you has a valuable role to play in shaping the future of Europe's seafood industry. I feel certain that the rich and varied conference programme offered at EAFE's XXIII will provide ample opportunity to engage constructively with the many questions and issues that currently face us. In particular, the special sessions on the impacts of public aid, and small-scale fisheries (both sponsored by DG MARE) offer a diverse range of speakers and topics that will resonate with many of you. Other sessions on the landing obligation, access to fishing rights, along with the insights from our distinguished keynote speakers make this an exciting and relevant conference.

At EAFE's XXIII more than 110 delegates from 20 countries, will discuss key economic issues facing fisheries and aquaculture. I have no doubt that this debate will resonate well beyond the three days of our meeting. EAFE's XXIII is also an opportunity to renew old acquaintances and make new friends. It is an occasion to discuss new research goals, to stimulate new thinking, and learn about the work currently being undertaken by the Associations members.

I wish each of you the very best. To all the speakers and poster presenters I add a special thank-you for sharing your work with us. Have a productive and successful conference and a very pleasant stay in Ireland.

Michael Keatinge
Acting CEO - Fisheries Director

General Information

Venue

Dublin Castle is one of the most important buildings in Irish history. From 1204 until 1922 it was the seat of English, and later British rule in Ireland. During that time, it served principally as a residence for the British monarch's Irish representative, the Viceroy of Ireland, and as a ceremonial and administrative centre. The Castle was originally developed as a medieval fortress under the orders of King John of England. Constructed on elevated ground once occupied by an earlier Viking settlement, the old Castle stood approximately on the site of the present Upper Castle Yard. It remained largely intact until April 1684, when a major fire caused severe damage to much of the building. Despite the extent of the fire, parts of the medieval and Viking structures survived and can still be explored by visitors today.

Following the fire, a campaign of rebuilding in the late-seventeenth and eighteenth centuries saw the Castle transformed from a medieval bastion into a Georgian palace. The new building included a suite of grand reception rooms known as the State Apartments. These palatial spaces accommodated the Viceroy and were the focus of great state occasions.

In the early nineteenth century the Castle was enhanced by the addition of the Chapel Royal in the Lower Castle Yard. This magnificent Gothic Revival structure, bristling with pinnacles on the outside and rich with ornamental features within, provided a place of worship for the viceregal household. It remains one of the architectural highlights of Georgian Dublin today.

On 16 January 1922, the last ever Viceroy of Ireland handed Dublin Castle over to Michael Collins and the government of the newly-independent Irish state. The end of the British presence had come about in the wake of the Easter Rising of 1916 and the Irish War of Independence. These momentous events paved the way for the creation of the Republic of Ireland and were closely associated with the history of Dublin Castle. Since that historic moment, a tradition of state ceremony has been maintained at the Castle. Successive Irish governments have continued to use it for important national events, such as state dinners and commemorations. Since 1938, each one of Ireland's presidents has been inaugurated in St Patrick's Hall, the grandest of the State Apartments.

Saint Patrick's Day Military Parade at Dublin Castle 1844 (Michelangelo Hayes)

General Information

Registration

Early registration for the conference will start on Monday with early registration and welcome drinks at The Dining Hall Atrium, Trinity College Dublin from 18:00. Registration will continue on Tuesday morning, from 08:15 onwards at the reception desk of the Dublin Castle conference centre.

Cloak Room

A cloak room is available for the duration of the conference. It is situated on the ground floor.

Internet connection

The internet connection during the conference will be available by connecting to the conference wifi network and the password is 'April-2017'. There are also a number of communal computers available on the ground floor, just before the cloak room.

Welcome Reception

For those that did not attend the welcome drinks on Monday there will be another chance to enjoy yourself with a BIM hosted reception on Tuesday, after the last sessions, from 18:00. Please join us for a drink, nibbles and music in the conference centre foyer!

Social dinner

The social dinner, sponsored by DG MARE and BIM, will be held on Wednesday 26th, 19:30 at the Thomas Pryor Hall, at the Clayton Hotel, Ballsbridge. A bus transfer service from Dublin Castle to the Hotel will be provided. Conference's participants will be picked up from Castle St. at 18:30. Buses will also be available to bring dinner guests back into Dublin city centre at 24:00.

Organisation

The European Association of Fisheries Economists

BIM Ireland's Seafood Development Agency

Department of Agriculture, Food and the Marine
An Roinn Talmhaíochta, Bia agus Mara

European Commission

Fáilte Ireland
National Tourism Development Authority

MEET IN IRELAND

Science Committee

Richard Curtin, Emmet Jackson (Bord Iascaigh Mhara), Leyre Goti (Thünen Institute of Sea Fisheries), Bertrand Le Gallic (Université de Bretagne Occidentale), Raúl Prellezo (AZTI-Tecnalia), Maria Cozzolino (NISEA)

Organising Committee

Emmet Jackson, Richard Curtin, Deirdre Moore, Michael Keatinge

Keynote Speakers

Daniel W. Bromley

Daniel W. Bromley is Anderson-Bascom Professor of applied economics (Emeritus) at the University of Wisconsin-Madison. Between 2009 and 2013 he was an Adjunct Professor at Humboldt University in Berlin. He is listed in Who's Who in Economics. He is a Fellow of the Association of Environmental and Resource Economists, and of the Agricultural and Applied Economics Association. In 2012 he received the Reimar Lüst Prize from the Alexander von Humboldt Foundation in Germany. He recently received the Veblen-Commons Award from the Association for Evolutionary Economics. He has been the editor of the journal LAND ECONOMICS since 1974.

He has served on the Ocean Studies Board of the U.S. National Academy of Sciences, and participated in four separate studies conducted by the Academy's National Research Council. He was a member of the Academy's special panel on America's Climate Choices. He has been a fisheries advisor to the State of Alaska, and to the Swedish Parliament. He served for 3 years as the founding Chair of the U.S. Federal Advisory Committee on Marine Protected Areas. Professor Bromley has worked and lectured in over 25 countries. He was an economic advisor to the Sudan People's Liberation Movement in the latter stages of the civil war in Sudan. More recently he designed and supervised the development of an economic recovery strategy in Iraq. Most recently, he has served as an advisor to the Government of the Faroe Islands on reform of fisheries policy.

Professor Bromley has written almost 100 journals articles, over 60 book chapters, and written or edited 15 books, including: (1) Economic Interests and Institutions: Conceptual Foundations of Public Policy; (2) Environment and Economy: Property Rights and Public Policy; (3) The Handbook of Environmental Economics; (4) Economics, Ethics, and Environmental Policy; (5) Institutions and the Environment; and (6) Sufficient Reason: Volitional Pragmatism and the Meaning of Economic Institutions. His latest book, written with Juha Hiedanpää, is entitled Environmental Heresies: The Quest for Reasonable (Palgrave/Macmillan).

Wednesday, 9am, Main Hall
'An Honest Fishery Policy for Europe: Governance, Access, and Sustainability'

Keynote Speakers

Ragnar Arnason

Ragnar Arnason is a professor of fisheries economics at the University of Iceland. Having received a M.Sc. degree in mathematical economics and econometrics from the London School of Economics in 1977, he was awarded a Ph.D degree in natural resource economics from the University of British Columbia in 1984.

Since becoming a professor in 1988, Arnason has primarily conducted his research in the area fisheries economics and fisheries management where he has a publication record of over 170 scientific articles and several books. In recent years, his research has primarily been in fisheries enforcement, fisheries rents, community fisheries management and the evolution of global fisheries and fisheries management. Among other things, he was one of three authors of the World Bank/FAO study the Sunken Billions (2009) and is currently engaged in the update of this global assessment of fisheries.

Professor Arnason has been a visiting scholar in a number of universities and research institutes in America and Europe. He has participated in many international research projects including six major European Union research projects and several Nordic and North American ones. He has been on the board of several business enterprises and is currently on the board of the Central Bank of Iceland. He has served on the board of IIFET (the International Institute of Fisheries and Trade) and was the chairman of the Institute of Economic Studies at the University of Iceland for over two decades.

Professor Arnason has advised the Icelandic government extensively on fisheries and other matters and was instrumental in developing the country's ITQ system in the 1980s. He has also provided advice on fisheries management and environmental issues to the governments of several countries in Europe, America, Africa and Asia in a private capacity or working for the World Bank, FAO, United Nations University Fisheries Training Programme, ICEIDA and the Nordic Investment Bank.

Thursday, 9am, Main Hall

Industry Day Keynotes

Barrie Deas

Chief Executive of the National Federation of Fishermen's Organisations (NFFO)

Barrie Deas has been the Chief Executive of the National Federation of Fishermen's Organisations since 1995. He is the chair of the Demersal Working Group of the North Sea Advisory Council and a member of the Executive Committee of the North West Water Advisory Council. He is a vice-president of Europeche.

Wednesday 11:20, Main Hall, Session 14
'The Future of UK Fisheries in the Context of Uncertainty'

Industry Day Keynotes

Mr. Gerard van Balsfoort

President Pelagic Freezer-trawler Association

Gerard van Balsfoort graduated in Geography at the University of Nijmegen, Netherlands, in 1977 and received an MBA in 1984 at the Interfaculty for Business Administration in Delft, Netherlands. After a 17 year career in the Ministry of Agriculture in the Netherlands where he held several (management) positions related to the Common Agricultural Policy and the Common Fisheries Policy, he became in 2002 managing director of the Dutch Fish Board, a semi-public industrial organization representing and funded by all companies and organizations in the Dutch seafood industry. Since 2006 Gerard van Balsfoort is president of the Pelagic Freezer-trawler Association (PFA) and the Dutch Pelagic Ship-owners Association. The Pelagic Freezer-trawler Association represents the interests of 9 European pelagic freezer-trawler companies, which fish for human consumption. PFA members are responsible, family-run companies, mostly going back to the late 19th century, who benefit from several generations of fishing experience and operate a combined fleet of 23 vessels. They are vertically integrated companies involved in the catching, processing, distribution and export of pelagic fish. The association currently has members in France, Germany, Lithuania, the Netherlands and the UK. Gerard van Balsfoort is also holding positions in national and European industry bodies related to fisheries: he is vice-president of Europêche (association of national organizations of fishing enterprises of the EU) and member of Excom of EAPO and chairing the pelagic working group under EAPO (European Association of Fish Producer Organizations). He is also heading the secretariat of the Pelagic Advisory Council (PAC), an official advisory body to the EU institutions. The PFA and the PAC are both closely collaborating with fisheries research institutes in the various EU member states and with ICES as overarching fisheries research body.

Wednesday 13:40, Main Hall, Session 16
'Outlooks for the European pelagic seafood sector'

Industry Day Keynotes

Wednesday 15:30, Main Hall, Session 17
'The impacts of the Landing Obligation and industry adaptation strategies'

Sean O Donoghue

CEO Killybegs Fishermen's Organisation (KFO)

Sean O Donoghue is CEO of Killybegs Fishermen's Organisation for nearly a decade and a half. He has a long established career in fisheries management having experience in the Department of Marine and BIM for twenty years prior to taking up his present position in 2000. He is a key player in a number of important fisheries areas both at national and European level and has been influential in ensuring the interests of the fishing industry are represented as necessary.

He has worked closely with the Marine Institute since its establishment and has promoted better dialogue between fishermen and fisheries scientists through a series of research projects. Under his guidance, KFO has been a proactive partner in a number of EU-funded projects:- Profet Policy, ACRUNET, MYFISH and EfficientShip which reflect the significant capacity which he can make available to important science-industry projects.

Chairman of the European Association of Producer Organisations, an Executive Committee member on three Regional Advisory Councils and Chairman of Working Group 2 in the Pelagic RAC, Sean is also a member of the EU Commission's Advisory Committee on Fisheries and Aquaculture, a Board member of Bord Iascaigh Mhara and a Board member and Chairman of the Federation of Irish Fishermen (FIF).

DG MARE Sponsored Special Sessions

Throughout the evolution of fisheries management in the European Union, the role of fisheries economics has grown. In DG MARE we have focused our efforts on ensuring that economic advice is now regarded as a fundamental tool for policy support. Economic analysis is now being carried out in all aspects of the Common Fisheries Policy and specifically in preparing conservation measures such as fisheries management plans, the landing obligation, catch quotas, the future of EU public support after 2020, the analysis of markets for seafood within the EU or for negotiations on fisheries subsidies at the WTO. We now aim to extend this research beyond the Common Fisheries Policy and to the wider "blue economy", a policy area where more economic analysis and modelling are needed.

Two elements are key for quality economic output: the availability of quality economic data and analysis carried out by highly qualified economists. The progress we have been making in collecting fisheries data, through the Fisheries Data Collection Framework, and the growing success of the annual economic reports for the catching, aquaculture and processing sectors, reflect the hard work and the excellence of the economists and researchers who have been contributing. We hope to be able to rely on the expertise of the fisheries economics community as we extend these efforts into the maritime economy field and as we try to understand the scale and trends of the entire maritime sector to a finer degree.

We have a very ambitious and demanding agenda ahead of us. As requests become increasingly sophisticated, our capabilities to respond will need to evolve too, and meeting in this challenge the Commission will rely on your knowledge and expertise.

I would like to thank the hosts of the EAFE conference for giving us the opportunity of holding two sessions of particular interest to the current and future Common Fisheries Policy:

1. The Small Scale Coastal Fleet: this sector has suffered from a lack of economic research over the years. That knowledge gap is being addressed by members of the European Association of Fisheries Economists in an independent manner throughout the European Union, but more needs to be done to make that research continuous and systematic. A better understanding of the role of the small-scale fisheries is needed to maintain coastal fishing communities.

2. Public Support to the fisheries sector and to coastal communities: in this area a reasonably clear picture is now developing within the EU compared to other regions of the world. Nevertheless, there is a pressing need to develop tools that accurately assess the possible case for public support for the fisheries and aquaculture sectors after 2020.

We hope that this conference will continue, as it has done in the past, to drive the development of research on these important topics.

Bernhard Friess

Director of Directorate-General for Maritime Affairs and Fisheries (DG MARE)

Commission Special Sessions

Tuesday 25th

Conceição Santos (Directorate General for Maritime Policy, Portugal)

'EU structural funds used for blue growth' – Session 5

Rod Cappell (Poseidon Aquatic Resource Management Ltd)

'MS fleet performance vs EFF investment ' - Session 8

Thursday 27th

Cristina Pita (University of Aveiro, Portugal)

'Small scale fisheries in Europe (Status, resilience and governance) Session 24

Benoit Guerin (Independent consultant and fisherman)

Understanding grassroots' factor explaining influence of the small-scale fishing segment in fisheries management in the European south western waters - Session 24

Alex Crowley (Chairman of the National Inshore Fisheries Forum's (NIFF), Ireland)

'The evolution of SSCF representation in Ireland and how the EFF/EMFF has supported this, through the eyes of an Irish SSCF' - Session 24

Juan Aga (NOAA Southeast Fisheries Science Centre)

'Impact of individual fishing quota on small scale fisheries in the Gulf of Mexico' – Session 25

EAFE 2017 CONFERENCE DUBLIN TIME PLANNER

Welcome Reception and Early Registration - Trinity College Dublin, Dining Hall Atrium – April 24th, 18:00

Tuesday 25th April

9:00			Registration		
10:00			Plenary Session 1 (Main Hall) Greetings from EAFE President, Director of Fisheries BIM		
11:00	Cofffee Break				
	Le Touche (Ground Floor)		**Main Hall (Lower Level)**		**President (1st Floor)**
	Session 1: Markets and marketing of fish products Chair: Bertrand Le Gallic (UMR-AMURE, UBO)		**Session 2: Fishermen's behaviour, economic entrepreneurship in a changing environment** Chair: Hans Van Oostenbrugge (Wageningen Economic Research)		**Session 3: The need for integrated advice and transdisciplinarity in fisheries management: bioeconomic models, mental models and narratives working together** Chair: Leyre Goti (Thünen Institute of Sea Fisheries)
11:30	Avdelas Lamprakis - Consumers preferences for certified seafood in Greece	11:30	Heleen Bartelings - Competitiveness of European fisheries and aquaculture: a CGE approach	11:30	Keith Criddle - The Economic Importance of Wild Pacific Salmon
11:50	Arnar Buason - Fond of fish? A count data analysis of how frequently French consumers purchase seafood	11:50	Klaas Sys - The effect of information sharing among fishers on the tactical decisions of beam trawlers	11:50	Pascal Le Floc'h - Exploring the more appropriate spatial scales towards an EBFM: lessons from the French experiences through a multidisciplinary approach
12:10	Julia Bronnmann - Sustainable seafood from aquaculture and wild fisheries: insights from a discrete choice experiment in northern Germany	12:10	Sanmitra Gokhale - Understanding financial risk for fishers and the role of diversification	12:10	Tin-Yu Lai - The role of food web interactions in multispecies fisheries management: an optimal bioeconomic analysis of Baltic salmon
12:30	Ignacio Llorente - Description of the seafood value chain in the EU	12:30	Thorolfur Matthiasson - Resource rent spillovers to fishers remuneration	12:30	Discussion
12:50	Discussion	12:50	Dicussion		
13:00	Lunch				

	Session 4: Markets and marketing of fish products Chair: Miguel Peña-Castellot		**Session 5: On Public Support** Chair: Dominique-Philippe Levieil (European Commission)		**Session 6: Implementation of the CFP Quota management** Chair: Claire Macher (IFREMER, Université Brest)
14:30	Chiara Bacci - EU consumer habits regarding fishery and aquaculture products	14:30	Conceincao Santos - EU structural funds used for blue growth	14:30	Claire Macher - An individual-based bio-economic model to investigate trade-offs in quota governance systems in the Bay of Biscay sole fishery
14:45	Leonidas Papaharisis - Market integration of new Mediterranean farmed species meagre and red porgy in Greece	14:40	Gilles van de Walle - Supporting small-scale coastal fisheries in Europe, the role of Fisheries Local Action Groups (FLAGs)	14:45	Debbi Pedreschi - Re-inventing the wheel: an alternative fisheries management system.
15:00	Olafur Klemensson - How the Icelandic fish processing has improved performance and increased value creation through applying new processing technologies	14:50	Gioacchino Fazio - The economic impact of the EFF on competitiveness of sicilian fish companies	15:00	Margarita Andrés - Implementing the fleet sequential behavior in MSE: the case of the Basque inshore fleet.
15:15	Angelos Liontakis - Market integration of the main fish species in Greece	15:00	Johan Blomquist - Effects of fishery subsidies: reinvestments and socioeconomic effects of the Swedish scrapping program 2008-2009	15:15	Itsaso Carmona Igartua - Portfolio theory as a tool to operationalize Ecosystem-Based Fisheries Management: the case study of Basque inshore fishery
15:30	Discussion	15:10	Discussion	15:30	Kane Elimane Abou - Dilemma of Admissible Catches of Individual Quotas: A Bioeconomic Illustration of Gaming Theory in Mauritania-EU Fisheries Agreements
				15:45	Discussion
16:00	Cofffee Break				
	Session 7: Markets and marketing of fish products Chair: Bertrand Le Gallic (UMR-AMURE, UBO)		**Session 8: Special session: On Public Support** Chair: Dominique-Philippe Levieil (European Commission)		**Session 9: Economic Indicators for sustainability monitoring** Chair: Richard Curtin (BIM)
16:30	Ignacio Llorente - Price integration in the Spanish seafood value chain	16:30	Miguel Peña - Castellot - EU spending vs other big 6 spending (conclusion of 2016 study)	16:30	Brian Burke - Modelling multispecies whitefish price dynamics
16:50	Avdelas Lamprakis - Price interactions of farmed seafood products in the Greek market	16:50	Rod Cappell - MS fleet performance vs EFF investment	16:50	Dario Pinello - Fisheries socio-economic sample survey in Italy: the importance of the non-statistical aspects

17:10	Yvonne Feucht - What do German consumers think about labelling, seafood guides and other information about (sustainable) seafood?	17:10	Jordi Guillen - Importance of the structural funds for the EU aquaculture sector	17:10	Gonzalo Rodríguez Rodríguez - Effect of climate change in mussel prices in Galicia (Spain): consequences for management.
17:30	Stephen Hynes - Attitudes and willingness to pay for sustainably produced salmon: An Irish and Norwegian comparative study	17:30	Discussion	17:30	Hans Van Oostenbrugge - Economic Effects of seabed protection on the Frisian Front and Central Oyster Grounds, "hard science in a soft process"
17:45	Discussion			17:45	Discussion
18:00	Wine reception				

End of First Day

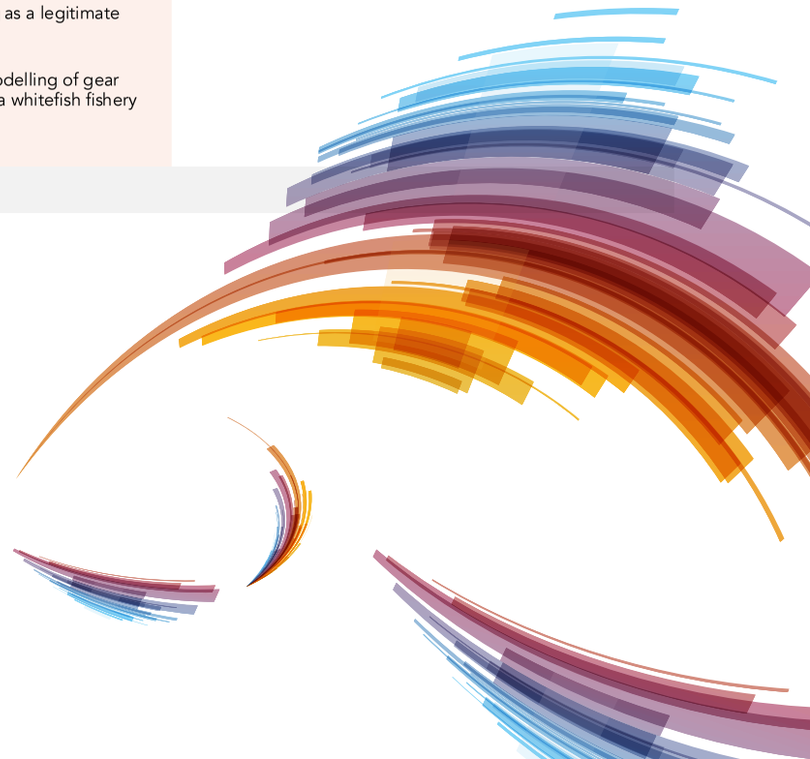
Wednesday 26th April

9:00			**Keynote Speaker: Professor Daniel Bromley (University of Wisconsin-Madison) An Honest Fishery Policy for Europe: Governance, Access, and Sustainability**		
	Le Touche (Ground Floor)		**Main Hall (Lower Level)**		**President (1st Floor)**
	Session 10: Markets and marketing of fish products Chair: Maria Cozzolino (NISEA)		**Session 11: Economic Indicators for sustainability monitoring** Chair: Jordi Guillen (Joint Research Centre)		**Session 12: Social dimension of fisheries: contributions from qualitative research to improve economic policy uptake and impact** Chair: Emmet Jackson (BIM)
10:00	Christophe Vande Weyer - Interim assessment of PMPs	10:00	Natacha Carvalho - Fleet dependency on stocks subject to TACs	10:00	Arne Kinds - Understanding technological innovation in the Belgian fishery from a regulatory, socio-economic and governance perspective
10:15	José L. Fernández Sánchez - Economic Analysis of the European Fish and Seafood Value Chain	10:15	Philip Rodgers - On the Question of the Cost of Capital	10:15	Daniel Skerrit - The extent and role of non-local workers in the EU fisheries sector
10:30	Cecilia Hammarlund - European Union fishing access agreements and fishery exports of African countries	10:30	Richard Curtin - Assessing unit costs within mixed fisheries for the Irish whitefish fleet	10:30	Estelle Jones - Economics or ethics? Pay gaps between domestic and international fishers
10:45	Discussion	10:45	Discussion	10:45	Discussion
11:00	Coffee Break				
	Session 13: The Galway agreement: opportunities to learn from the different perception of fish products in the EU, USA and Canada Chair: tbc		**Session 14: Implementation of the CFP including Industry speaker: Barrie Deas (NFFO)** Chair: Raúl Prellezo (AZTI-Tecnalia)		**Session 15: Social dimension of fisheries: contributions from qualitative research to improve economic policy uptake and impact** Chair: Natacha Carvalho (Joint Research Centre)
11:20	Paola Reale - Trans-Atlantic cooperation: Aquaculture business, research and education priorities	11:20	Barrie Deas - The Future of UK Fisheries in the Context of Uncertainty	11:20	Rannvá Danielsen - Evaluating the socioecological performance of fisheries management in the Faroe Islands

11:40	Halley E. Froehlich - Public perceptions of aquaculture: evaluating spatiotemporal patterns of sentiment around the world	11:35	Griffin Carpenter - Understanding the impact of different Brexit scenarios on the UK's fishing fleet	11:40	Thomas Nyrud - Fisheries in the north of Norway – Direct and indirect effects on employment and economic activity in coastal communities
12:00	Kolbrun Sveinsdottir - Motives and barriers for seafood consumption: Consumer perception in five European countries	11:50	Simon Mardle - Competitiveness of scallopers in the English Channel	12:00	Tobias Belschner - The policy objectives of the CFP – Challenges and solutions
12:20	Bertrand Le Gallic - Which potential for the development of (European) seafood products: an analysis of the perception of French consumers.	12:05	Arina Motova - SEAFISH bioeconomic model: enhanced utilisation of data available for policy support	12:20	Discussion
12:40	Discussion	12:20	Jennifer Russell - SEAFISH bioeconomic model: Choke Points and Problem Stocks for UK Fleet under the Landing Obligation, 2017-2019		
		12:35	Discussion		
12:50	Lunch				

	Session 16: Implementation of the CFP with Industry speaker: Gerard van Balsfoort (PFA) Chair: Simon Mardle (Fishor)	
13:40	Gerard van Balsfoort - Outlooks for the European pelagic sector	
13:55	Marta Moran Quintana – Economic performance of the UK king scallops fishing fleet	
14:10	Luca Mulazzani - Individual transferable effort quotas for the Italian fisheries? A preliminary analysis	
14:25	Raúl Prellezo - A dynamic general equilibrium model for the economic assessment of EU fisheries policies	
14:40	Discussion	
15:10	Coffee Break	

	Session 17: Plenary session 4: The bioeconomics of gear selectivity adaptation and the Landing Obligation with Industry speaker: Sean O'Donoghue (KFO) Chair: Michael Keatinge (BIM)	
15:30	Sean O'Donoghue - The impacts of the Landing Obligation and industry adaptation strategies	
15:45	Richard Curtin - Economic assessment of BIM gear selectivity trials 2013-2016	
16:00	Katia Frangoudes - Stakeholders' opinion about the Landing Obligation and transformations of Social, Economic and Ecological systems of EU fisheries	
16:15	Eckhard Bethke - Overfishing as a legitimate management goal	
16:30	Coilin Minto - Within-year modelling of gear changes in the Irish Celtic Sea whitefish fishery	
16:45	Discussion	
17:00	EAFE General Assembly	
	End of Second Day	
18:30	Bus to Social Dinner	
19:00	Social dinner	



Thursday 27th April

9:00			**Keynote speaker: Professor Ragnar Arnason (University of Iceland) – 'Fisheries Management: What works and what doesn't'**		
	Le Touche (Ground Floor)		**Main Hall (Lower Level)**		**President (1st Floor)**
	Session 18: Access to fisheries and the right to fish Chair: Philip Rodgers (University of Lincoln)		**Session 19: Role of small-scale fisheries: examples of innovation, adaptation and participation** Chair: Arantza Murillas (AZTI-Tecnalia)		**Session 20: Aquaculture: Best practices in management and commercialization** Chair: Bertrand Le Gallic (UMR-AMURE, UBO)
10:00	Manuel Pacheco Coelho - Producers organisations, cooperation and fisheries sustainable development: The Portuguese Case	10:00	Hugo Ballasteros - Good and bad poachers: lessons for the shellfish resources management from Galician Shellfish gatherers communities.	10:00	Jarno Virtanen - Added value of nutrient neutral growth in Finnish aquaculture sector by nutrient recycling
10:15	Griffin Carpenter - Who has the right to fish? The distribution of fishing opportunities in Europe	10:15	Antonio Alvarez - Assessing the technology and technical efficiency of artisan fishing boats	10:15	Magdalena Raftowicz-Filipkiewicz - Determinants of specific carp supply chain in the Lower Silesia Province in Poland
10:30	Melina Kourantidou - A Case for the Commons: The Snow Crab in the Barents	10:30	Fabienne Daures - Promoting coastal fisheries products in a competitive environment: the French case of the seabass Breton label "Bar de ligne de la pointe Bretagne"	10:30	Mona Dverdal Jansen - The salmonid industry cost of controlling the spread of pancreas disease in Norway
10:45	Discussion	10:45	Discussion	10:45	Discussion
11:00	Coffee Break				
	Session 21: Access to fisheries and the right to fish Chair: Staffan Waldo (Swedish University of Agricultural Sciences)		**Session 22: Role of small-scale fisheries: examples of innovation, adaptation and participation** Chair: TBC		**Session 23: Aquaculture: Best practices in management and commercialization** Chair: Maria Cozzolino (NISEA)
11:30	Hans Ellefsen - Trial auctions in the Faroe Islands in 2016	11:30	StaffanWaldo - Can coastal fisheries coexist with seals?	11:30	Roberto Furesi - Economic performances and sustainability related to use of innovative feed in aquaculture: empirical evidences from the Italian farming
11:45	Manuel Pacheco Coelho - Lessons from the "Turbot War"; The future of high seas governance	11:50	Marga Andrés - Fish trap impacts in the Red Sea	11:50	Suzanne van Osch - Estimating the European Publics' Value for Sustainable Aquaculture in Europe - A Country Comparison
12:00	Robert Arthur - Institutions, power and agency - The socio-economic interface of fisheries governance reform	12:10	Richard Curtin - The bioeconomics of the north Irish Sea razor fishery	12:10	Tobias Lasner - How to maintain Carp Farming in Europe – A Matter of Region-Marketing?
12:15	Sezgin Tunca - Cooperative vs Non-Cooperative Benefits in the Black Sea Anchovy Fishery				
12:30	Discussion	12:30	Marta Moran Quintana - Economic performance of the UK king scallops fishing fleet	12:30	Discussion
		12:50	Discussion		
13:00	Lunch				
			Session 24: Plenary session 6: European small-scale fisheries: valuation and interaction of recreational and commercial fisheries Chair: Miguel Peña-Castellot (European Commission)		
		14:00	Cristina Pita - Small scale fisheries in Europe: challenges and opportunities for the future		
		14:10	Benoit Guerin - Understanding grassroots' factors explaining influence of the small-scale fishing segment in fisheries management in the European south western waters		
		14:20	Alex Crowley - The evolution of SSCF representation in Ireland and how the EFF/EMFF has supported this, through the eyes of an Irish SSCF		
		14:30	Natacha Carvalho - Socio-Economic Importance of Small-Scale Fisheries in EU Fisheries Coastal Communities		
		14:40	Discussion		

15:30	Coffee Break
	Session 25: Plenary session 7: European small-scale fisheries: valuation and interaction of recreational and commercial fisheries Chair: Miguel Peña-Castellot (European Commission)
16:00	Juan Aga - Impact of individual fishing quota on small scale fisheries in the Gulf of Mexico
16:10	Arantza Murillas-Maza - Enhancing Small Scale Fishing Sector´s participation in decision-making
16:20	Amaya Vega - Small versus large-scale fishing operations in Ireland: Understanding the socio-spatial dimension of small scale fisheries
16:30	Leyre Goti - Small scale fisheries and participatory conservation measures in protected areas: can a more economic and social approach to the CFP reconcile biodiversity with provision and cultural ecosystem services?
16:40	Angel Calvo - The annual economic report and the economic relevance of the SSCF in Europe
16:50	Discussion

Closure of the conference

Notes

Consumers preferences for certified seafood in Greece

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During the recent years, there has been a growing interest of promoting and rewarding sustainable management in fisheries and aquaculture using product differentiation through certification. Differentiation is also thought to be a means for increasing competitiveness. While organic certification is not popular among producers in Greece, a growing interest is identified for sustainable certification mainly for products addressed to export markets. In Greece, sustainable certified seafood products are recently introduced in the retail market. We employ an on-line survey conducted during January 2017 to elicit consumer awareness for sustainability and organic certification labels. At the same time we present results of a stated preferences choice experiment addressing consumer choices for sustainable seafood products in the Greek market. Five different species (namely anchovy, hake, seabass, meagre and mussels) are included. Certification, sustainability and origin attributes are introduced in the experiment. We employ econometric models to identify determinants of consumer choice among the attributes in the choice experiment. Finally, as suggested in the Galway agreement we present public perceptions of aquaculture for Greece.

Keywords: Fisheries, Aquaculture, Certification, Choice, Greece

Fond of fish? A count data analysis of how frequently French consumers purchase seafood

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This paper is concerned with analyzing the demand for seafood products in the French market, which is the largest consumer market for fish in Europe and its largest market for salmon. The study expands the demand literature in two ways. First, by combining classical microeconomic theory and the marketing convention of analyzing purchase frequencies. Second, by extending the relatively simple microeconomic model of Meghir and Robin (1992) to also include a budget constraint where consumers receive revenue from income and other transfers, and consequently making the time constraint more robust and flexible. We assume that the underlying data generating process of purchase frequencies follows the negative binomial distribution and use maximum likelihood to estimate a demand system that takes these statistical properties into account, thus allowing for over-and under-dispersion. The model contains five fish product categories; fresh salmon, frozen salmonidae, fresh cod, frozen white fish, and other seafood products. The analysis is based on French scanner data for the years 2010-2013 which consists of weekly observations of seafood purchases by 22,000 households and includes detailed information on socioeconomic and geographical characteristics of participating households. The results show that consumers purchasing different types of fish are vastly heterogeneous; healthy, young individuals with university education who live in Paris and northern France are, for instance more likely to purchase fresh salmon, while those who purchase frozen white fish are typically older, of lower class and come from a large household in southern France. By thus identifying the typical consumer, the results can be applied for marketing strategies, aimed at increasing store traffic and generating higher profits.

Keywords: Frequency of purchase, negative binomial, demand, EU, France

Sustainable seafood from aquaculture and wild fisheries: insights from a discrete choice experiment in northern Germany

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There is an increasing focus on sustainable seafood that creates a potential for segmentation in the seafood market. Several recent studies demonstrate a consumer preference for wild seafood that is labeled as sustainable relatively to unlabeled seafood. In addition, there is increasing evidence of a preference for wild fish relatively to farmed fish despite an increasing aquaculture production and market presence. Recently, ecolabels have been introduced also for farmed fish. An interesting question is if the preference for wild fish primarily is related to the perceived sustainability for aquaculture or whether it is a perceived quality difference. A choice experiment is used to investigate these issues in Germany for salmon. Using a mixed logit model, the random parameter specification indicates substantial variation in consumer preferences beyond demographic variables. In particular, the ecolabel makes up for the negative association of aquaculture, indicating that environmental concerns and not quality differences are the major issue.

Keywords: Sustainable seafood

Price integration in the Spanish seafood value chain

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This work analyses price interactions at different levels of the seafood value chain from the primary sector to the retail stage (price transmission) and between different products/producers (market integration) in the Spanish market for different species. It also considers the influence of international trade on domestic prices formation for different intra and extra EU trade flows and domestic markets of seafood commodities. The analysis also helps to identify asymmetries in the transmission of prices and situations of market power in the seafood value chains and their potential impacts on the incomes received by producers'. The statistical method used to study the relationships among these is the cointegration analysis. The prices at ex-farm, wholesale and retail levels have been collected weekly from the database of the Spain's Ministry of Agriculture and Food through the Observatory of Food. Prices for Spain's imports were obtained from the European Commission's Eurostat trade database. The results suggest different situations of price transmission and potential bargain power.

Keywords: Price transmission, market power, value chain, seafood, Spa

Competitiveness of European fisheries and aquaculture: a CGE approach

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The global demand for seafood products is increasing. In a globalised economy, this should generate high opportunities for any seafood production activity. However, both fisheries and aquaculture companies in Europe are facing key challenges, which currently hinder them from reaping the full benefits of seafood markets expansion, and even question their sustainability. As a whole, the EU fisheries sector remains at low levels of profitability and sustainability. This paper will analyse how competitive European fisheries, aquaculture and fish processing sectors are compared to fisheries aquaculture and fish processing sectors in other regions and simulate how this position may change in the next 20 years.

To simulate the trade competitiveness of the European fisheries and aquaculture sectors over the next 20 years we will further develop a global computable equilibrium (CGE) model MAGNET. A macro-economic tool such as a MAGNET is an excellent way to explore interactions between sectors and regions. By explicitly modelling wild catch fisheries, aquaculture and fish processing sectors we can explore interactions between aquaculture and fisheries, for example fisheries providing fishmeal and fish seed to aquaculture. Feed will also be explicitly modelled and attention is given to the competition between aquaculture and cattle sectors for available feed. Fish stocks will also be explicitly modelled. As Magnet is a global tool we are also able to explore changes in trade patterns of seafood products.

Few examples of CGE models describing the dynamics of fisheries exist in the literature. This paper is unique in that it includes aquaculture, fisheries, and fish processing sectors. In order to understand the seafood production market better we feel that these extensions are essential and overcomes a deficiency in current CGE models.

This study has been financed under the EU H2020 project SUCCESS.

Keywords: Fisheries; aquaculture; macro-economic modelling; bio-economic modelling

The effect of information sharing among fishers on the tactical decisions of beam trawlers

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Accurate estimations of fish stock status remains a critical point of fisheries management, and is a major cause of dispute between fishers and policy makers. While fishers often claim, based on their catches, that fish stocks are in good status, scientists often see different trends during scientific surveys. We examine the underlying mechanism of this different observation between fishers and scientists. Therefore, we study how information sharing among fishers - by means of satellite tracking systems - influence the tactical decisions of fishers during a fishing trip in an individual based model. In this model, fishers can decide to stay on the same patch, move according a Lévy walk, or go to the fishing grounds where most fishing vessels are actually fishing. We hypothesize that fishers are attracted to fishing grounds where other fishers are present instead of using a local search strategy to find a good fishing spot, and that this strategy is more pronounced at lower densities of a fish stock. Preliminary results show that fishers go to fishing grounds where other fishers were present the previous days, and as a result, spend less time to find a good fishing spot. If the density of the fish stock decreases, this strategy is more pronounced; the radius in which fishers are attracted to other vessels increases. As a consequence, this strategy influences the link between catchability and fish density, which may explain why fishers are able to maintain relatively high catch rates at lower densities of fish. When we compare our results with the dynamics of the Belgian beam trawler fleet targeting sole (Solea solea) in the Irish Sea, we observe a similar pattern which can explain why the catch rates of fishers are remarkably higher than those obtained by scientific surveys.

Keywords: fleet dynamics, beam trawling, agent based modelling

Understanding financial risk for fishers and the role of diversification

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Fishers' risk management strategies are so far poorly understood. They face high income variability due to fluctuations in market price and catches of fish. One of the ways to mitigate this risk, has been to diversify between various stock and regions and construct portfolios of quota. This has made taking a portfolio approach popular. This research will empirically analyse the diversity of revenues of fishers' using Norwegian fisheries data. Using a diversity index, we look at whether there are any longer term trends in diversification and differences in diversification between pelagic and demersal fishers. Further, we analyse whether diversification differs between vessel groups (which is based on vessel length) and depends on the home port of a vessel. We also investigate fisher behaviour with respect to their risk-reward relationship. This research speaks to the current financial risk management behaviour of fishers as well as their risk profile, and can provide insights into better risk management methods for fishers going forward. As fishers face a trade-off between specializing, which can be beneficial in the short term, and diversifying, which can help adapt to changes in the longer term, this research also contributes to understanding their adaptive capacity. It also has policy implications, as some quota systems encourage specialization (such as, regulations limiting who can participate in a fishery), which can be harmful for the long term financial well-being of the fishers' as well as the local economy at large.

Keywords: Financial risk

Resource rent spillovers to fishers remuneration

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Icelandic fishers operate on a higher wage rate than they might have attained in another profession. There could be a number of reasons for this. Fishers are more likely to be full-time workers than the average worker in the economy. Fishers are away from home and they experience more occupation-related hazards than the average worker. Part of their higher wage is compensation for such differences. We utilize a database consisting of information gathered from official registry data (tax returns, labour market surveys, education attainment and the national person registry) that has earlier been used to calculate return on education to estimate remuneration gains when a person switches from any occupation to fishing, correcting for individual factors and for factors like working hours. Preliminary results indicate that a person enjoys an hourly wage that is 39 to 50% higher than that they (considering explanatory variables such as age, education and sex) could have earned engaged otherwise.

Keywords: Resource rent

The Human Dimension in Fish Stock Assessments

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One of the most important sources of information in fisheries management are the stock assessments. Fishery management systems rely on stock assessments to achieve their goals such as conservation or managing fishing pressure. The models employed are highly complex, relying on advanced mathematical and statistical tools and are fed with the latest data available (Cadrin & Dickey-Collas 2014, Zimmermann & Enberg 2016). In theory, these models should be updated if there is new scientific information either in regard to the fish stock or in the computational/ modelling process. Yet, this might not be all that influences changes in stock assessments: scientists might impact stock assessments through their interests and behaviour { they are humans, after all. This paper will scrutinize the hypothesis that there is a human dimension that drives stock assessment changes. In particular, the status of a fish stock might influence assessments since scientists may feel pressure when working on a stock that is about to collapse. Further, there may be a discrepancy between the model prediction and the presumption or "gut-feeling" of scientists on what should have been predicted which leads to slight adjustments in the model. The analysis will be conducted with ICES (International Council for the Exploration of the Sea) stock assessment data of the last 30 years for 77 stocks. Every time a stock assessment is conducted the model gives updated biomass values for the previous years as well. As a result, there are several spawning stock biomass (SSB) estimates for a year, depending on the assessment year. The coeficient of variation (ratio of standard deviation to the mean) across assessment years for each year is calculated in order to measure the change over years. As a starting point, we will test three overarching hypotheses. First, we hypothesize that the status of the stock has an impact on changes in the stock assessment model assumptions. If the changes are purely driven by new scientific data there should be no significant correlation. Second, at a certain point in time ICES introduced fixed moments at which models should be reconsidered (benchmarks). We hypothesize that the introduction of such benchmarks reduces the "wiggle room"and also reduces the coeficient of variation. Further, we hypothesize that the more detailed an assessment is done and reported, the less room there is for a human influence. In particular, we are interested whether the provision of references points decreases the human dimension in stock assessments as well as the actual reporting of the specific model used.

Keywords: Fish Stock Assessments

The Economic Importance of Wild Pacific Salmon

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This presentation explores the economic role of Pacific salmon (Oncorhynchus spp.) in Japan and Alaska, including an overview of the development and evolution of commercial fisheries, their diminished but locally important role as a subsistence good and basis for non-pecuniary economic exchange, their increasingly important value in sport fisheries and as a source of other non-monetary benefits, their social and cultural roles of salmon and salmon fisheries, and the regional economic impact of salmon fisheries. The presentation also addresses historic and on-going efforts to influence Pacific salmon production including salmon hatcheries, predator suppression, fertilization of lakes and streams, habitat restoration, and the influence of environmental degradation on the abundance of Pacific salmon and the value of salmon fisheries. The effects of the Great East Japan Earthquake and Tsunami of 2011 are used to illustrate of how salmon-dependent economies can be affected by catastrophic events. The economic and social effects of evolving systems for governing and managing salmon catches are discussed because those systems vary through time and across regions and greatly affect the magnitude and distribution of economic value. Interdependencies between aquaculture and the capture fisheries and the role of third-party certifications and credence values are briefly discussed to highlight their influence on exvessel prices through their impact on global markets and on the social and institutional structure of the fisheries for Pacific salmon.

Keywords: Pacific salmon, fisheries, economic value, governance

Exploring the more appropriate spatial scales towards an EBFM: lessons from the French experiences through a multidisciplinary approach

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Since the 2013 reform (of the CFP?), the Ecosystem Based Fisheries Management (EBFM) has been acknowledged as the way to implement fishing activities in the European Union,. EBMF is an integrated approach for the management of fish stocks based on a multi-species framework and considers all human activities impacting the marine natural resource. An integrated approach raises often very complex challenges when extended to a large geographical scale. We analyze here the challenges and context of the implementation of an EBFM from four major aspects strongly related to this holistic approach. A SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) is used to identify how the definition of appropriate spatial scales could conciliate all these four major factors with an EBFM. Firstly, the legal aspects that play a key role through the multiple European and Member States directives and regulations. This includes the Common Fishery Policy (CFP), the Integrated Maritime Policy (IMP), the Framework for Maritime Spatial Planning (FMSP), the Marine Strategy Framework Directive (MSFD). Secondly, social factors which are defined since the origin of the CFP in 1983 as "the particular needs of regions where local populations are dependent on fisheries". This fundamental point outlines the principle of the relative stability, negotiated in 1976 by the Council of the founders of the Community, joined by the UK, Ireland and Denmark. Thirdly, the economic performance of the fleets, which may impact producer behaviors, asking for public assistance when the revenues are low (as the results of low abundance of the resource, ex-vessel prices dropping, fuel cost increase...). Lastly but more importantly, the biological state of the fish stocks and its ecosystem which constitutes the final target of an EBFM, as stated in the objectives of the latest version of the CFP "to ensure that negative impacts of fishing activities on the marine ecosystem are minimised and ...[to] avoid the degradation of the marine environment (CFP, 2013). We propose in this paper a multidisciplinary approach to account for all of these factors raising the issue of the most appropriate spatial scale for developing a successful EBFM. The paper is supported by two case studies, one on small-scales fisheries with operators from one Member State, the other on mixed fisheries with operators from several Member States. The experience drawn from these two case studies in France steers the discussion on governance and stake-holders strategy to influence the decision-making. The article suggests some ways for the more appropriate spatial scales towards an EBFM, requiring a regionalised fisheries management understood as a transferred process of consultation and decision-making towards the stakeholders.

Keywords: Ecosystem Based Fisheries Management

President

Session: 3 - The need for integrated advice and transdisciplinarity in fisheries management: bioeconomic models, mental models and narratives working together

The role of food web interactions in multispecies fisheries management: an optimal bioeconomic analysis of Baltic salmon

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The potential of a salmon stock to provide fish for harvest is not only determined by the harvest and the biological conditions of the salmon population itself. Food web interactions among salmon and other species take a role for population development and further affect the sustainable harvest level of salmon. This study built up a bioeconomic multispecies model, which considered the food web relations among Baltic salmon, Bothnian herring, and grey seal, to estimate the maximum economic yield (MEY) of salmon fishery. In the model, the grey seal population reduces the profit for salmon fishery in two mechanisms: (1) increasing the seal-induced damage directly on salmon fishery, and (2) enhancing the natural mortality of migrating salmon at post-smolt and homing stages. Bothnian herring, however, serves as food sources for salmon at post-smolt stage, which provides opposite influences on natural mortality of post-smolt. For policy orientation, we assessed the effects of herring fishery on salmon fishery. We optimized the salmon harvest value to reach MEY in three scenarios: (1) with herring fishery harvesting at current level; (2) with herring fishery harvesting at given maximum sustainable yield (MSY) level; and (3) with herring fishery harvesting at MEY level. In the second scenario, the optimal harvests of salmon were near zero in some years. The low harvest of salmon resulted from that the herring stock was not high enough with herring harvested at MSY level. In the third scenario, we optimized the harvest value of salmon and herring simultaneously to simulate the situation of multispecies management. Compared to the first two scenarios, optimizing the harvest for both fisheries simultaneously increased the economic value for the fisheries and created higher SSB for both species. This results imply the importance of adopting multi-species management for fishery.

Keywords: bioeconomic modelling, multispecies, food web interactions

EU consumer habits regarding fishery and aquaculture products

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The European Union is a major market for fishery and aquaculture products: in 2015, European households spent 54 billion euro for these products. Consumption per capita is also on the rise, and is catching up with its pre-economic crisis levels (2008: 26 kg per capita, 2015: 25,5 kg per capita). In parallel, public funding has been made available under the European Maritime and Fisheries Fund (EMFF) to promote consumption of seafood, develop marketing strategies so as to increase competitiveness at all stages of the supply chain and better inform consumers.

Yet, the EU market suffers from a lack of analysis of consumer behaviour, expectations and preferences that encompasses the 28 Member States and provides a comparable picture of the typical consumer of seafood across the entire EU. The analysis commissioned by the Commission aims to bridge this gap and to increase the level of knowledge of what EU consumers look for and what factors determine their purchase of seafood. The analysis builds on an opinion poll carried out through face-to-face interviews with more than 27.000 citizens across the EU in June 2016. It answers the following questions:

- How frequently do consumers eat and/or buy these products? What types of products do they buy and where they buy them?
- What influences consumption?
- Why do people buy or eat seafood and why not?
- Are there specific preferences (wild vs farmed products, sea vs freshwater products, origin)?
- Do consumers trust information on seafood?
- How relevant is consumer information?

Keywords: Consumer habits

Market integration of new Mediterranean farmed species meagre and red porgy in Greece

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Keywords: Market integration, Mediterranean farmed species, first sale prices, cointegration

Production and marketing of species other than European sea bass (Dicentrarchus labrax) and Gilthead sea bream (Sparus aurata) is an initiative for market differentiation, adopted from several Mediterranean farmers. Red porgy (Pagrus pagrus) and meagre (Argyrosomus regius) are new products of Mediterranean fish farming produced in noticeable quantities and are available year round in various presentations. Both are distributed in the existed value chains, with the traditional Mediterranean farmed species. This is the first attempt to look for market integration between various presentations of new species in Greek market. Based on time series of first sales' prices for the period 2012 to 2015, we will check if different presentations of new species compete in the same market and additionally we are going to look for competitive behaviour with traditional Mediterranean farmed species. Furthermore, based on the wholesale prices of red porgy for the same period, we are going to look for vertical integration. Unit root tests were used to check time series properties of the prices and cointegration techniques were used to check for possible market integration.

How the Icelandic fish processing has improved performance and increased value creation through applying new processing technologies

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Increasing value creation is constantly the main agenda for the fish processing plants in competitive environment and under the restrictions given by scarce resources of the sea. The main driving force is to improve economic performance of the companies and reach sustainable competiveness. This is achieved by adopting digital and automated industrial technologies (robotics, horizontal and vertical integration in the production processes). This gives the fish processing sector in Iceland (and other European fish processors) new competitive edge in increased labour cost advantages, shrinking the motivation to move processing to low cost locations (as can been seen in development of fish processing in China). At the present great number of the fish processing plants in Iceland have taken large steps toward applying these advanced technologies to reduce their cost bases, improve quality of the end products, customise their products, building new and improving old customer relationships and last but not least to speed up all the processes in the value chain to bring the products faster to the customers. In this paper the technical development in the fish processing will be mapped in a time-line form. The implementation of technical novice and innovations and changes in the companies' organisation will also be described. The focus will be on the following:

Technical development and R/D:

- Development of integrated, automated and optimised production flows across the supply chain
- The challenges and the driving forces, from the standpoint of the processing plants
- R/D and technical development stemming from the research community in Iceland
- The implementation and adoption of technical innovation and new equipment and software
- The close cooperation during the development time and implementation between the technical developers and the processing plants
- Who are the main technical developers and producers of high-tech processing equipment in Iceland

Impacts on economic performance: The outcome of adopting digital and automated industrial technologies in terms of value creation, bringing the products to the market faster, lower work-in inventory, higher quality, productivity gains and reduced cost base will be estimated and discussed.

The research approach: This study is based mainly on case studies on a number of leading fish processors in Iceland. This will be complemented with in-depth interviews with the main suppliers of high-tech equipment and with production managers of leading fish processing plants. Data from the manufactures of equipment and from the processors will be used as well as statistics from the Statistic Office and the Fisheries Directorate.

Keywords: fish processing, technical development, value chain, value creation, operational performance, competitiveness

Marketing and consumption of food algae in France: what new strategic challenges?

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Algae production is experiencing remarkable global growth, from 2 million tons in 1970 to 20 million tons in 2010. At European level, production was about 250 000 tons in 2012, dominated by Norway

(57% of European production), France (14%), Ireland (12%) and Iceland (7%). Although France ranks second in Europe, the seaweed sector has very little information on consumption and marketing. No large-scale studies have been conducted in France. The aim of the Idealg program is to develop the macro algae sector in France: promotion of production, consumption and marketing technologies.

Three phases are developed in this program:
- what is the consumption of food algae;
- what is the market for food algae;
- how to improve the match between supply and demand?

The objective of this article is to present the main results of the first two phases.

Concerning the first phase, a study at national level made it possible to understand the knowledge and perception of food algae, the characteristics of the current consumption, the expectations with regard to these products and the brakes to consumption.

- A method of direct interviews with 825 people was carried out in 7 cities of France.

- A method of semi-directive interviews with 80 people, ie 10 focus groups, were also set up in five cities in France.

Concerning the second phase, an analysis of the French market for food algae was carried out in the form of store check. One hundred and eleven stores in seven different cities were analyzed: organic shops, delicatessens, Asian stores, hypermarkets, supermarkets and fishmongers. This method allowed us to understand the marketing of food algae and the characteristics of the current supply

Keywords: food algae, marketing, consumption

Market integration of the main fish species in Greece

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This study explores the level of fish market integration in Greece, for the most important commercial species. Fishery is a vital economic sector in Greece. In 2014, The Greek fishing fleet consisted of 14,755 registered vessels (of which, 13,600 are active). A unique characteristic of the Greek fishing fleet is that it consists mainly of small-scale fishing vessels (12,762) that exploit the extensive Greek coastline using polyvalent passive gears (mainly nets, longlines, pots, and traps). Despite the fact that the vessels of this segment are small, they are vital for the local economies regarding job opportunities and have strong ties to them. On the other hand, there are 838 active medium-scale fisheries (i.e. bottom trawlers and purse-seiners). Fisheries in Greece, as in all the Mediterranean countries, are recognized for the large number and variety of commercially important species caught and the range of fishing methods employed. The study utilizes available monthly data on the average vessel-level price in the 11 Greek fish auctions from 2012 to 2016. Market integration is approached by the law of one price, which assumes that prices of homogenous commodities should be equal across regions. In our case, if fish markets are fully integrated, we expect that the difference between the price levels for each fish species should be stationary among fish auctions. Panel unit root tests are applied to test for market integration, and the results are presented and discussed. Finally, we test for differences on market integration in species that are focused on specific gear types, and we explore the role of geography on market integration.

Keywords: market integration, law of one price, fishery sector

EU structural funds used for blue growth

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Keywords: EU structural funds used for blue growth

Supporting small-scale coastal fisheries in Europe, the role of Fisheries Local Action Groups (FLAGs)

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The small-scale coastal fisheries segment has traditionally not been the largest recipient of EU fisheries subsidies. A lack of knowledge, resources or effective networks are among the limiting factors preventing this specific segment of the EU fleet from taking advantage of public support schemes. Community-Led Local Development (CLLD), funded under the European Maritime and Fisheries Fund (EMFF), follows in the footsteps of Axis 4 of the EFF in its attempt to mainstream participative, bottom-up development in EU fishing territories. While not limited to supporting a specific segment of the fleet, this tool is particularly well adapted to reaching out to those situated at the periphery of decision-making circles. The presentation will capitalize on the results of a survey carried out by the FARNET support Unit aimed at assessing the scale of support that FLAGs have mobilized for European small-scale coastal fisheries. It will highlight the amount and types of support provided while offering preliminary thoughts on the effectiveness of FLAG/CLLD support towards small-scale coastal fisheries.

Keywords: Small scale coastal fisheries, community-led local development, fisheries subsidies

The economic impact of the EFF on competitiveness of Sicilian fish companies

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The measure 2.3 of the European Fisheries Fund, in Sicily, claimed investments of fish companies in production capacity expansion and modernization of fish processing.

Have these investments been effective in supporting the competitiveness of these companies and have they influenced the economic sustainability of the regional seafood chain?

Proposed analysis contributes to this assessment through an exploratory survey and a review of the changes in their business performance.

Keywords: European Fisheries Fund, Sicily

Effects of fishery subsidies: reinvestments and socioeconomic effects of the Swedish scrapping program 2008-2009

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Sweden implemented two scrapping campaigns in 2008 and 2009 to reduce fishing capacity in the Baltic Sea and the North Sea trawl fisheries for cod. Totally 140 million SEK were spent on these campaigns, of which approximately 100 million SEK was funding from the European Fisheries Fund (EFF). The scrapping program resulted in a 26 % reduction of the fleet capacity in this segment. Although the number of trawlers has decreased, it has been possible for fishermen to retain their fishing licenses and continue fishing in other segments. To what extent participants in the scrapping campaigns have reinvested in the Swedish fisheries is, however, not known.

In this study, we make use of microeconomic data from multiple sources (logbooks, vessel registers, and administrative labor market statistics) to analyze firms and individuals that have received scrapping support. The purpose is to evaluate to what extent owners of the scrapped vessels have reinvested in new vessels and how their effort and catches have evolved after the scrapping campaigns. The study also analyzes the socioeconomic effects by examining if fishermen have left their employment in the sector, and the labor market status of former fishermen (other employment, unemployment, retired, etc.).

We find that a number of vessel owners have reinvested in new vessels after the campaigns. These vessels are on average smaller compared to the scrapped vessels and mainly target other species than cod. The fact that the scrapping subsidies seems to have led to increased effort in fishery segments where it is relatively easy to enter shows the importance of considering spillover effects when introducing a scrapping program. The effects of the scrapping program is also compared to the effects of the ITQ system introduced in the in the pelagic fisheries (herring, sprat and mackerel) in 2009.

Keywords: Scrapping programs; Fisheries subsidies; Fisheries management

President

Session: 6 - Implementation of the CFP - Quota management

An individual-based bio-economic model to investigate trade-offs in quota governance systems in the Bay of Biscay sole fishery

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Efficiency of quota governance systems was one of the major issues debated in the context of the reform of the Common Fisheries Policy. Pros and cons of quota markets and alternative systems were largely discussed in the process. In France, quotas management was gradually delegated to Producer Organizations that manage catch share through a pooling system with redistribution of non-transferable fishing allocations. Most stakeholders rejected the introduction of individual transferable quotas (ITQs). An individual-based bio-economic model (IAM) was developed and applied to the Bay of Biscay sole fishery to investigate alternative systems of governance from a multi-criteria perspective. The model integrates several institutional arrangements related to catch share management (from harvest control rules to individual quota allocation) and their interactions with biological and economic dynamics. Biological and socio-economic impacts of a quota-market scenario are compared to the current co-management system in a context of transition schemes to maximum sustainable yield (MSY). Trade-offs between ecological and socio-economic impacts are highlighted and the effectiveness of governance scenarios is discussed with regards to the challenge of capacity adjustment. Results emphasize that the introduction of ITQ is expected to reduce the number of vessels in the fishery in particular of the sole netters that would be quotas suppliers. While effectively mitigating the economic impacts of the transition phase to MSY, ITQs are also expected to significantly increase the trawling effort and decrease netting effort, which may cause ecological concerns.

Keywords: Bio-economic model; Individual-based model; fisheries management, quota governance systems; catch share; ITQ

President

Session: 6 - Implementation of the CFP - Quota management

Re-inventing the wheel: an alternative fisheries management system

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The distribution and overlap of fish populations frequently change on small spatial and short temporal scales. In mixed fisheries, in order for fishers to avoid a quota-limited (i.e. 'choke') species, whilst targeting another requires knowledge of these fine spatial and temporal distributions. Current management strategies generally operate at large scales and are based on annual assessments, leaving them unable to neither account for these characteristics, nor to provide this information to fishers. Increasing awareness of the need to manage fisheries within an ecosystem approach, along with a growing dissatisfaction with the complexity and ineffectiveness of the status quo has led to a growing push for alternative management strategies.

Real-time Incentives (RTI) fisheries management offers a viable alternative to current management systems, one that can operate on finer spatial and temporal scales and incorporate management for important ecosystem components. Furthermore, the system aims to simplify the management rules with expected benefits for both managers and fishers. RTI employs a philosophy of stakeholder engagement and co-design to ensure the delivery of a system fit for the real world, whilst incorporating their views and increasing transparency and credibility. RTI uses fishery and ecological data to calculate tariff maps which will be provided electronically to a console on the vessel. The system provides incentives for compliance, the incorporation of low impact and fuel efficient (LIFE) gears and smart technologies, thus internalising costs into the system whilst providing the flexibility for fishers to determine their best tactics to maximise profit sustainably.

Here we illustrate how the RTI system would work, and provide details as to how we are currently testing it via a management strategy evaluation (MSE) approach.

Keywords: Real-time incentives, fisheries management, management strategy evaluation

President

Session: 6 - Implementation of the CFP - Quota management

Implementing the fleet sequential behaviour in MSE: the case of the Basque inshore fleet

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Often evaluation of management strategies does not include an appropriate model to describe the fleet dynamics of the fishery. Strong assumptions, such as total allowable catch (TAC) being taken exactly, lead to 'non-realistic' results. An exception to this occurs in mixed fisheries where fleets catch more than one species at the same time with different TAC of each species. The fleet dynamics of mixed fisheries are often modelled in order to predict the necessary effort to comply, as far as possible, with all TACs of main target species. Thus, this mixed fisheries model avoids potential inconsistencies. The objective of this work is to broaden the range of potential fleet dynamics models in the FLBEIA toolbox for management strategy evaluation by including a sequential fishery. The selected case study is the inshore fleet of the Basque Country whose activity is divided among different fishing seasons along the year targeting one main species at a time. First, the métiers of each fleet were defined on the basis of the fishing gear, the seasonality and the fishing profile. Annual landings, prices and variable costs were assigned at métier level, while the fixed costs were assigned at fleet level. The simulations run into annual time steps and included 6 fleets, 52 métiers and 8 species. The new fleet sequential behaviour model mimics the seasonality by setting a minimum and maximum effort of each seasonal métier based on historical effort used. Then, different sequential fleet dynamics scenarios were defined according to past observed situations with known consequences, so that the simulation results could be compared to historic data. The results illustrated the importance of an appropriate definition of the fleet dynamics both in terms of socio-economic and biological indicators.

Keywords: Sequential fleet behaviour, Management Strategy Evaluation, FLBEIA

President

Session: 6 - Implementation of the CFP - Quota management

Portfolio theory as a tool to operationalize Ecosystem-Based Fisheries Management: the case study of Basque inshore fishery

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The objective of this paper is to analyse how Portfolio theory can contribute to operationalize Ecosystem Based Fisheries Management (EBFM), based on selecting an optimal portfolio that maximizes income and minimises the variance. For doing so, the value of landings of the Basque inshore fleet has been used. The daily sale notes of 37 stocks in the period 2001-2015 are used to calculate the optimal composition of income while taking into account sustainability constraints.

In order to compare single-stock management and ecosystem-based management, two efficient frontiers were built for the last five years (2011-2015). The difference between these two frontiers is the variance-covariance matrix in the optimization problem. To calculate the ecosystem efficient frontier, the information of the stock's interactions (collected for the full variance-covariance matrix) is used, whereas in the stock efficient frontier only the stock's variances are used. Additionally, for the same five-year period, the historical composition of stocks' income was compared with the portfolios of the efficient frontiers to analyse if the fleet could have had the same expected income with lower variability.

One advantage of this approach is that the data can be routinely collected and the efficient frontier can be built using constraints to ensure the sustainability of the stocks and management objectives.

Keywords: Ecosystem-based fisheries management, portfolio theory, inshore fleet

Dilemma of Admissible Catches of Individual Quotas: A Bioeconomic Illustration of Gaming Theory in Mauritania-EU Fisheries Agreements

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Inspired by game theory "fish war game" of Levhari and Mirman (1980), this theoretical model is revisited to bring the bio-economic analysis of the process of determining Total Allowable Catch and repair in individual quotas in agreements Mauritania-EU fishing. The main originality compared to the base model is the inclusion in the utility functions of financial compensation paid by the EU to Mauritania. The model assigns individual quotas strategies to prevent the utility of each country in relation to a given financial compensation, catch trends and thus the optimal level of income by country for a maximum sustainable yield. The results and assumptions of the model are first discussed at the Nash equilibrium, and then examined the impact of cooperation in the allocation of IQ for sustainable fisheries, the Ombudsman Mauritanian political responsibility and level Net 'quota allocation.

Keywords: Bioeconomic Model, Total Allowable Catch, Fisheries Agreement, RIM, EU, fish War Game, Nash Equilibrium, Game Theory, Cooperation

Description of the seafood value chain in the EU

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The purpose of this research is to provide a "Market map" of the seafood sector in Europe, through the identification of the different stages, agents, and relations between them in the main markets. The research has been developed through an analysis and synthesis of the information obtained from official data sources and the contributions made by the SUCCESS2 partners. The results provide information about the general seafood value chain in the EU, a synthesis and general description of the value chains for different species (mussel, salmonids, carp, seabream and seabass, whitefish, flatfish and coastal fisheries), and a description of 30 different value chains for different species at their main EU markets. Seafood value chains present similar structures in which the main differences are found in the origin of the chain, in the first sale, and the chains are more homogenized as the product advances to the consumer until retailer segment, increasingly dominated by retail chains. There is evidence of an increasing complexity (new agents, alternative channels, vertical integration, shortening of channel, retail concentration...), new bottlenecks and constrains (standardize products, large production scales) and different initiatives to overcome them (producer organizations, labelling...).

Keywords: Price transmission, market power, value chain, seafood, Spain

Price interactions of farmed seafood products in the Greek market

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The price interactions of farmed seafood products in the Greek market are examined. Inner species interactions for various size categories of domestically produced species (seabream and seabass) are analysed at production and wholesale level. Market integration for domestically produced species is tested throughout the value chain from production to retail level while export price is used as a proxy for the international markets. Imported species (salmon and pangasius) are analysed at wholesale and retail level while import price is used as a proxy of the international market. Price interactions among species are analysed at wholesale level. The monthly price series data employed for the analysis covers the four year period from January 2012 to December 2015. The analysis employs ARDL models and Bunds test to test for cointegration among various species and size categories in various levels of the value chain. The results suggest that not all size categories are cointegrated and not all species are cointegrated leading to the conclusion that they do not interact in the same market segments.

Keywords: Farmed seafood, market integrations, Bounds test, Greece

What do German consumers think about labelling, seafood guides and other information about (sustainable) seafood?

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Consumers are increasingly interested in the sustainability of seafood since negative aspects of fisheries and aquaculture are widely discussed in public. As a result and in order to help consumers to make purchase decisions in line with their preferences the sector has developed a multitude of information means such as eco-labels and seafood guides. But questions remain with respect to how consumers perceive these different information means, if they use them and if these information influence consumers' purchase decisions. The present contribution aims to explore these questions for German seafood consumers in more detail in focusing on the perception of obligatory indications of the products (e.g., catching area, production method), eco-labels and seafood guides issued by NGOs.

At the beginning of November 2016 three focus groups with 9 to 10 participants each were conducted in the German cities Brunswick and Hamburg. The focus groups were analyzed by qualitative content analysis. The results reveal that participants were in general in favor of the obligatory indications. They perceived them as valuable information even though actual use in the shopping situation was limited. Many participants stated to consider eco-labels in their purchase decision. Simultaneously, participants mentioned to be skeptical about labelling schemes and their reliability. The multitude of labels was criticized. Some participants longed for one holistic sustainability label. Part of the participants was aware of the existence of seafood guides of NGOs and used mainly the online versions. The existence of such guides was welcomed but their suitability for everyday use was doubted. Overall, participants appreciated the provision of information off- as well as online. Participants attached the highest importance to the basic information presented on or near by the product. These results are in line with earlier research that the willingness to look for and to process additional information is limited among fish consumers, even if current knowledge is low.

Keywords: Eco-labels, consumer information, online communication

Session: 7 - Markets and marketing of fish products

Attitudes and willingness to pay for sustainably produced salmon: An Irish and Norwegian comparative study

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Around the world, there is a growing emphasis on developing the aquaculture industry in an environmentally, economically and socially sustainable manner and this is the case also in Norway and Ireland. The impact of aquaculture on the environment is currently evaluated by the use of a set of indicators focusing mainly on physical and chemical parameters, while to date social acceptance has not been integrated fully into aquaculture sustainability evaluation. With this in mind, this paper examines the public attitudes of the Irish and Norwegian general public to marine aquaculture. Both countries have long coastlines, a significant aquaculture industry and a strong emphasis on public participation in decision-making. The paper also estimates the Norwegian and Irish public's Willingness to Pay (WTP) a premium for sustainably farmed salmon using the Contingent Valuation Method (CVM). Single bound dichotomous choice CVM models are estimated and we test for the impact of consequentiality on model and WTP estimates. In order for a hypothetical constructed market in a CVM situation to be potentially incentive compatible the survey must first be consequential to the respondent; that is, it must have some potential effect on their future utility. We employ probit and bivariate probit models to examine this issue.

Session: 8 - Special session; On Public Support

Subsidies to the fisheries, aquaculture, and marketing and processing subsectors in major fishing nations beyond the EU

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The presentation would summarise the findings of the study and will also look at implications for future funding on the fisheries sector in the post-2020 period.

Keywords: Subsidies

Session: 8 - Special session; On Public Support

The impact of EU Fleet investment under the European Fisheries Fund

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The European Fisheries Fund (2007-2013) supported Member States and their fisheries sectors in the implementation of the Common Fisheries Policy across the EU with a total of €5.5billion in funding of which €2.6 billion was on the fisheries sector. On-board investment was one area of EFF support, which accounted for 8% of fisheries spend.

For some Member States on-board investment represented much higher proportions of their fisheries spend (such as Belgium and the Netherlands with 55% and 42% respectively). On-board investments modernise the fleet and are assumed to make the fleet more efficient, with one potential gain being reduced fuel use intensity.

The Annual Economic Report (AER) indicates that EFF-supported investment represented around 20% of EU fleet investment over the EFF programme period. EU fleet investment reduced during the economic crisis to a low point in 2009 and consequently the EFF-supported contribution was greatest in this year at 24.4%. This presentation explores how EU-supported fleet investment has contributed to the economic performance of the fleet.

Keywords: EU Fleet investment

Interim assessment of PMPs

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Community law, through the regulation on the common organisation of the markets (CMO regulation), considers that fishery and aquaculture producer organisations (POs) have a prominent role in achieving the objectives of the common fisheries policy (CFP) and of the CMO. It was therefore necessary to enhance their responsibilities and to provide the necessary financial support to allow them to play a more meaningful role in the day-to-day management of fisheries within the framework defined by the CFP in ensuring that their members carry out fishing and aquaculture activities in a sustainable manner, improve the placing on the markets of their products and eventually improve their incomes.

To that end, the CMO regulation provides POs with the obligation to elaborate and submit production and marketing plans (PMPs) and the EMFF regulation established the obligation to provide public financing to support this essential tool.

After two years of implementation, the Commission, based on continuous feedback from the sector and from Member States, decided to launch an interim evaluation of the implementation of this key measure. Carrying out this assessment quite upstream in the programming period would make it possible to implement corrective measures and improvements early enough to maintain the present momentum.

Keywords: production and marketing plans

Importance of the structural funds for the EU aquaculture sector

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EU aquaculture production has decreased 8.6% over the period 2000-2014, despite the public investment, through EU structural funds, of €1.17 billion in the aquaculture sector during the same period. The EU is planning to spend €1.72 billion on the aquaculture sector over the period 2014-2020 through the European Maritime and Fisheries Fund (EMFF). This study provides an overview of the different structural funds allocations for the aquaculture sector and across EU Member States. The current EMFF (2014-2020) is compared with the two previous EU fisheries fund, the Financial Instrument for Fisheries Guidance (FIFG) and the European Fisheries Fund (EFF). The importance of these subsidies is put into perspective by comparing the evolution of each across and within the evolution of different EU countries' aquaculture sectors.

Keywords: aquaculture, EMFF, subsidy

Modelling multispecies whitefish price dynamics

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Implementation of the reforms of the European Union Common Fisheries Policy (CFP) in 2014 has important economic implications for commercial fishing vessels in the Irish fleet, e.g., the Landing Obligation. Commercial fishing vessels, like many resource users, have obstacles to overcome to maximise their resource rent; such as choke species in mixed fisheries, selectivity and product quality. Improvements in gear technology, species selectivity and catch composition have biological implications for fish stocks but also have important economic implications for the fishing industry. As price and landings comprise revenue, the price received by fishing vessels is a critically important factor for short- and long-term sustainability of the fishing industry. Developing a modelling framework to investigate species-specific and inter-species price dynamics is essential.

Using aggregated data, this paper develops a general framework for time series modelling of price dynamics. Accurate modelling requires consideration of: covariates such as grade, quantity landed and freshness; measurement and process variability; and seasonal dynamics. A key component of the approach developed is the ability to model multiple species together to incorporate level, trend and seasonal covariance. A type of state space model, known as a Dynamic Linear Model, was developed and applied to cod, haddock and whiting data. Fit quality was assessed using information criteria for the training dataset and forecasting bias and precision in the testing dataset. Preliminary results show the importance of seasonal dynamics for all three species, though the strength of seasonal variation varied among grades and product quality. Having accurate price models will improve the economic dynamic components of broader bioeconomic evaluations of the impacts of CFP reforms.

Keywords: price dynamics, state space models, forecasting

Fisheries socio-economic sample survey in Italy: the importance of the non-statistical aspects

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The limited availability of fisheries socio-economic data often reflects insufficient technical capacity for planning and implementing socio-economic data collection programs; in particular, the non-statistical components such as the data collectors and data quality check phase. This will be particularly important in those cases where there is a lack of official data, or were the data are considered unreliable, as is often the case with small scale fleets.

In addition to the statistical methodology, this matter is addressed in the Italian data collection program by placing emphasis and effort on survey design and on training data collectors. A set of procedures have been developed for collecting the information through interviews when administrative information is not available or not considered reliable. The first phase of work is focused on the data collectors, their selection, training and supervision and all the instruction needed for the operational work in the field.

Another crucial phase is the data quality check of the raw data, which is mandatory before the data processing phase. The first quality check is done together with the data collector, highlighting the potential errors and, when required, asking for a second interview of the fisher. The subsequent steps are facilitated by a set of automatic routines based on logical steps which also take into account the local habits of the fisheries.

In general, the main focus of the socio-economic data collection is placed on the livelihoods of the fishers and vessel owners; employment; general profitability of the activity and ownership patterns. In the socio-economic assessment of fisheries remuneration is one of the key indicators and is also the most challenging to estimate: a socio-economic survey that provides estimates of remuneration that are close to the reality is a successful survey. For this reason, together with the direct data on remuneration, the formula for its calculation is collected to improve accuracy of estimates.

Conceptually, the sampling scheme, although statistically robust and approved by the National Institute of Statistics (ISTAT), is straightforward among the probability sampling techniques. The application of this methodology itself allows for more resources to be applied for more crucial elements of establishing a robust data collection process. The success of this data collection programme then also lies with non-statistical aspects, including the data collectors.

Keywords: Efficiency, Concentration, Data Envelopment Analysis, small-scale fishery

Economic Effects of seabed protection on the Frisian Front and Central Oyster Grounds, “hard science in a soft process”

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The Frisian Front and Central Oyster Grounds have been selected for area protection measures under the Marine Strategy Framework Directive (MSFD, EU, 2008) because of their high benthic biodiversity scores relative to the rest of the Dutch North Sea. The aim of the Dutch government for the Dutch part of the North Sea is to protect 10-15% of the Dutch Continental Shelf against appreciably disrupting by human activities, with a minimum impact for the fishermen (Ministry of I&M, Ministry of EZ, 2012). During a stakeholder process 6 possible variants for closed areas have been developed and a cost benefit analysis for each of the variants was carried out. The research question for this paper is twofold: (1) What the economic costs are for each of these six variants and (2) how the scientific input has been shaped by the governance process. The first question is answered by an in depth analyses of the activity patterns of the Dutch fisheries on the proposed closed areas and a scenario analyses of possible effects of closures. The fishing activities were analysed using a combination of Vessel Monitoring Data and logbook data. The estimation of the effects of closures took into account possible external developments such as fish prices, fuel prices, other closures and technical innovations and possible displacement effect. The effects were based on both scientific insights and stakeholder views. The results show possible economic effects of the closures, their dependency on the underlying assumptions and the role of these outcomes in the stakeholder process.

Keywords: spatial closures, impact assessment, stakeholder involvement

Market survey on the willingness of consumers to choose certified molluscs: overview on fasolari shellfish (Callista chione)

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The Italian mussel’s production is among the highest in Europe. Italy is the main producer of “fasolari” (Callista chione). Unlike massive species, the fasolari record consumer prices quite high, from 9 to 14 € / kg. The market survey, carried out in the second and third quarter of 2016, had two main objectives:

A) Understand the reasons why the fasolari are produced in Veneto, but their main market is South Italy;

B) Understand the importance that is attributed to sustainable production of molluscs.

The market survey is based on questionnaires to consumers, in the regions of Veneto, Campania and Puglia. The most important concerned a strong maturity and awareness among consumers of fish to prefer local or, at least, national molluscs. With regard to the purchase channel, about 50% of those surveyed still prefer traditional stalls and, if possible, about 25% would be interested to buy directly at zero miles. The survey showed a high buying interest from consumers in Campania and Puglia, where the product is consumed uncooked. In Veneto, the production region, the consumption is very low, and it is characterized by extra-domestic choice. Many rooms for improvements emerge from survey and regards to changing consumer eating patterns. Related to the degree of knowledge of the certificates in the fish sector, the consumers have shown considerable confusion. Certification is often associated with the concept of hygienic-sanitary safety of molluscs. Modest percentage of the sample showed awareness about significance of voluntary and sustainable fisheries certification. Compared to certification, it emerges low propensity and an unwillingness to pay more. Consumers recognize a higher market positioning for certified molluscs, but recognition is also linked to the added value of the certificate shellfish product, such as a processed.

Keywords: market, certification, eco-labelling

Economic Analysis of the European Fish and Seafood Value Chain

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The term Value Chain (hereafter VC) refers both to a set of interdependent economic activities and to a group of vertically linked economic agents. A VC starts with the production of a primary commodity and ends with the consumption of the final product. It includes, therefore, all the economic activities undertaken between these phases such as: processing, wholesaling, and retailing. The objective of this study is to show how the revenues, costs, and profits of different agents are distributed over the entire VC. To do this analysis, we employ the VC methodology, which attempts to understand value creation, activities of actors and their financial performance along the chain (Deng et al., 2016). To do our research, we have employed fish and seafood prices obtained from EUMOFA and economic data of EU28 firms obtained from the AMADEUS (total) database for the period 2009-2013.

Keywords: Seafood Value Chain

European Union fishing access agreements and fishery exports of African countries

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The European Union's fishing access agreements in developing countries have been widely criticized and are often associated with poor transparency, inequitable benefit sharing, conflicts with small-scale fishermen and depletion of fish stocks. Developing countries without access to large-scale fleets has been motivated to sell fishing rights as compensations often are important parts of their government budgets. However, many countries also have strategies for developing their own domestic fishery sector and have chosen to terminate access agreements with the European Union.

So far, there is little evidence of the net-benefits of fishery access agreements on the economies of developing countries. The aim of this paper is to contribute to filling this gap by investigating the effects of the European Union's fishing access agreements on African countries' fish landings and exports. More specifically, the effects of terminating fishing access agreement on host-country landings and the extensive and intensive margin of trade is investigated.

Using panel data methods and detailed data on exports of fishery products for the period 1980-2010 we show that domestic landings decrease if an agreement is terminated, that the volume of exports is unaffected and that the probability of trade with foreign partners decreases. Thus the results indicate that production aimed at the domestic market decrease whereas production for foreign markets is unchanged. Terminating a fishing access agreement is also associated with a loss of trade partners, suggesting that the agreements give exporters access to a larger market.

Keywords: Exports, EU policy, fishing access agreements

Fleet dependency on stocks subject to TACs

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Every year the EU fixes the Total Allowable Catch (TAC) for most commercial fish stocks in line with Regulation No 1380/2013. TACs are defined on the basis of scientific advice from advisory bodies such as ICES and STECF, and should take into account biological and socio-economic aspects. The assessment of the socio-economic impacts of TACs on EU national fleets relies on economic data collected through the EU Data Collection Framework (DCF). This data is analysed and presented in the Annual Economic Report on the performance of the EU fishing fleets (AER) produced by STECF. Yet, the AER economic performance indicators refer to fleet segments and don't relate directly to fish stocks. Stocks are defined in the TACs regulation by a combination of species and Fisheries Management Zones (FMZ). FMZ are geographical areas delineated with a regulatory perspective in mind. They incorporate a series of specifications such as the exclusion of external territorial waters. In some cases, these specifications result in different boundaries with respect to areas identifying stocks according to a biological perspective and/or with respect to fishing areas defined by FAO, ICES and other RFMOs. This study develops a fish stock dependency indicator (FSD) for the stocks (or TAC units) listed in the Council Regulation (EU) 2016/72. The FSD indicator focuses on providing an estimate of the economic relevance that each stock subjected to a TAC has on EU fishing fleets from a regulatory perspective. The FSD consists in the proportion between the value of landings associated to a given stock and the total value of landings of a fleet segment. The dependency ratio by itself does not provide any measure of the effects from setting the TACs at a certain level. In fact, the FSD being a simple proportion does not require modelling. Most of the added value of this exercise lies in addressing some of the limitations posed by the aggregation of DCF transversal data and building a bridge between the economic data which is collected at EU level by fleet segments and the stock definitions (or TAC units). The link is established through spatial processing methods which make use of detailed ancillary data on the distribution of fishing effort.

Keywords: Total Allowable Catch (TAC)

On the Question of the Cost of Capital

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Work on several current aspects of fisheries, notably in the production of reports for the European Commission's Scientific, Technical and Economic Committee for Fisheries, has raised the question of the cost of capital.

As an opportunity cost this ought to be relatively simple; the return, an interest rate, on the next best perfectly safe investment. However, a number of factors cloud what this figure is. Four theories are usually given to explain the departure of interest rates from reflecting the cost of capital; expectations, risk premium, liquidity preference, and market segmentation (preferred habitat). Risk premium includes an accommodation for the issuing government and may partly explain considerable differences in government bond rates between the European Union Member States.

(Clark and Munro 2016) recently suggested using a constant value, the expected return on long term capital projects of 3.5% for the UK. This implies that the opportunity cost of capital varies with the country which can only be true if international money markets are inefficient.

This paper considers these questions and concludes that a lower figure may be appropriate and capable of being used across borders.

Keywords: Cost of capital; Opportunity cost; interest rate

Session: 11 - Economic Indicators for sustainability monitoring

Assessing unit costs within mixed fisheries for the Irish whitefish fleet

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The objective of this study is estimate the total cost involved in landing one unit (1 kilogramme) of selected species of the Irish fleet. The costs involved in landing different species will differ due to the fisheries in which these species inhabit. Hake and nephrops are landed mainly by the polyvalent general fleet, the largest segment of the Irish fleet with the most vessels, total tonnage and vessel power. This segment mostly fishes using demersal trawls but can also use gillnets and other assorted gears. The segment lands a multitude of demersal species (over 70) in varying quantities however it has been recognised that there are three main mixed fisheries that this segment exploits; the nephrops fishery (NEP), the hake-monkfish-megrim fishery (HMM) and the cod-haddock-whiting fishery (CHW). Within the segment the vessel length classes above 18m account for the majority of landings of the main species in these fisheries.

To estimate cost per unit of landings of a species first the total costs of the group of vessels landing the species must be assessed. Costs of the Irish fleet are assessed at an annual time step through Data Collection Framework (DCF) economic surveys sent out to active fishers. Costs are calculated annually for all the segments of the Irish fleet above 10m and estimates are made for those below 10m. With this annual cost by segment the cost must be disaggregated to the level of one unit of the species in question. The methodology used to do this will be described.

Keywords: costs; mixed fishery disaggregation; effort management, multispecies

Session: 12 - Social dimension of fisheries: contributions from qualitative research to improve economic policy uptake and impact

Understanding technological innovation in the Belgian fishery from a regulatory, socio-economic and governance perspective

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The Belgian fishing fleet is one of Europe's smallest, comprising 69 active fishing vessels in 2015 mainly targeting sole (Solea solea) and plaice (Pleuronectes platessa). No less than 79% of the landings are accounted for by beam trawlers, which are known to have a significant impact on benthic ecosystems. Although the fishery shows strong parallels with the neighboring Dutch fishery in terms of target species, fishing grounds and fishing methods, they are also different in many ways. The Dutch fishery has a reputation of high efficiency, innovation, consideration for the environment and a strong entrepreneurial attitude of fishermen. The Belgian fishery, on the other hand, is said to lack these dynamics. Also Belgian fisheries managers and researchers are often tempted to think about the Dutch and Belgian fisheries in these general terms, taking the Dutch fishery as a model.

We conducted eight semi-structured interviews with fishermen between January and March 2016 to understand the factors that stimulate and hamper innovation and investment in the Belgian fishery. All these fishermen stated that they considered (and tried out) different alternatives to the traditional heavy beam trawl. They also explicitly expressed to be open to new suggestions and remained on the look for new developments that could potentially improve their fishing practices. The alterations were not of the same scale as investments observed in the Dutch fishery in the past years. However, the results of the interviews suggest that researchers and fisheries managers must reconsider their views on innovation in the Belgian fishery. Although these fishers may not represent the entire Belgian fleet, the findings suggest other reasons than fisher attitude that hamper large innovations in the Belgian fishery. These include a variety of socio-economic, governance and regulatory drivers.

Keywords: Belgian fishery, innovation determinants, fisher attitude

The extent and role of non-local workers in the EU fisheries sector

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The EU fisheries sector has undergone numerous transitions over the past few decades and one aspect of this has been a changing workforce demographic. Once solely supported by local workers the sector now employs increasing numbers of workers originating from other countries (both EU and non-EU). However, there is little in the way of systematic data collection to establish the level of non-local labour, their roles in the industry and their distribution within the EU and specific subsectors and fleet segments. Reports documenting the increasing prevalence of non-local, and in particular migrant, workers, and in some cases their unfair treatment, have raised several key questions: What is the nature and extent of non-local workers in the EU fisheries sector? What are the mechanisms for their employment? How is it facilitated and regulated? And are there issues of inequality and fairness that need to be addressed?

We present findings from a recent EU-wide evaluation of the extent of non-local labour in the catching, processing, and aquaculture subsectors. We highlight their uneven distribution, with non-local workers being concentrated in three EU Member States. We also highlight that, across the EU, non-local workers are largely focused within fleet segments that work offshore, due to both structural and legislative factors associated with these segments. Findings at the regional (EU) scale are supplemented by a number of localised case studies that provide contextual insights, and begin to identify different mechanisms and drivers (push and pull factors) for the employment of non-local and migrant workers. Within this, third-party agents have emerged as important actors, highlighting an important area of future enquiry. Finally, we outline the key 'unknowns' and propose a future set of research priorities based on the research findings.

Keywords: Labour; Migration; Employment

Economics or ethics? Pay gaps between domestic and international fishers

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Marine fishing is increasingly viewed as a 'globalised sector of the world economy' and employment aboard vessels described as 'a truly global, multi-national and multi-cultural occupation'. However, while there is a wide variety of regulatory frameworks governing the seas, there is an absence of policies and laws that ensure transparent, fair and ethical employment practice. Coupled with increasing allegations of poor working conditions and poor pay levelled at different nations fishing industries, this is a cause for concern.

We present evidence from Scotland, a nation where a significant proportion of crews on fishing vessels are international, mainly from outside the European Economic Area (EEA). Data collected in 2015 on vessel labour costs shows potential differentials in earnings for UK, EEA and non-EEA crew working on board Scottish fishing vessels. Analysis shows that levels of pay are significantly lower for contract crews (mainly non-EEA) compared to their Scottish counterparts, even when employed on the same boats carrying out the same work.

The question arises whether the remuneration differences are justifiable economic consequences of local and global labour markets, or whether they constitute a failure of maritime governing institutions to prevent unjust pay discrimination. Using the concept of distributive justice, we explore the data in relation to five types of justice: moral desert; contractual entitlement; equal share; satisfaction of need/welfare; and maximising utility/efficiency. Exploring these issues is important as seafood consumers increasingly demand environmentally certified products, yet the human dimension of marine fisheries is less promoted, less understood and a significant component for advancing the sustainability agenda.

Keywords: Labour; Pay; Justice

Trans-Atlantic cooperation: Aquaculture business, research and education priorities

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The Galway Statement signed in May 2013 is a trilateral international agreement for transatlantic research cooperation between Canada, the European Union and the United States; this agreement launched the Atlantic Ocean Research Alliance (AORA). Four Working Groups have already been established by the AORA around the following research priority themes: Aquaculture, Ocean Literacy, Seabed Mapping and the Ecosystem Approach to Ocean Health & Stressors. To support the AORA Working Groups, the EU Horizon 2020 Research programme funded an AORA Coordination and Support Action to support the Trilateral Working Groups formed by the Atlantic Ocean Research Alliance around these research priority themes and to provide preliminary mapping and connectivity assessments and sectoral analysis to contribute to long-term aligning the planning and programming of trans-Atlantic research activities.

In addition, several international research projects were launched under the Galway Statement to advance scientific knowledge and promote international collaboration. The efforts of these international research projects and the AORA Working Group have furthered the understanding of aquaculture processes, impacts and benefits but also indicated common challenges and gaps to many countries such as utilization of available marine space, weak "social license" for marine aquaculture development that further complicates and slows down efforts to license business operations. The need to communicate seafood production success stories, including: local level cases which may have international value by pointing to health effects and other social and economic benefits has also been identified along with international transfer of best practice e.g. investments in aquaculture education and examples of social awareness campaigns to promote aquaculture products. These amongst others have been identified and listed on a roadmap by the Aquaculture Working Group as areas of trans-Atlantic interest

This presentation will present the progress, future action plan and engagement opportunities identified by the AORA Working Groups and the international research projects funded under the Galway Statement.

Keywords: Galway Statement

Public perceptions of aquaculture: evaluating spatiotemporal patterns of sentiment around the world

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Aquaculture is developing rapidly at a global scale and sustainable practices are an essential part of meeting the protein requirements of the ballooning human population. Locating aquaculture offshore is one strategy that may help address some issues related to nearshore development. However, offshore production is nascent and distinctions between the types of aquatic farming may not be fully understood by the public –important for collaboration, research, and development. Here we evaluate and report, to our knowledge, the first multinational quantification of the relative sentiments and opinions of the public around distinct forms of aquaculture. Using thousands of newspaper headlines (Ntotal = 1,596) from developed (no. countries = 26) and developing (42) nations, ranging over periods of 1984 to 2015, we found an expanding positive trend of general 'aquaculture' coverage, while 'marine' and 'offshore' appeared more negative. Overall, developing regions published proportionally more positive than negative headlines than developed countries. As case studies, government collected public comments (Ntotal = 1,585) from the United States of America (USA) and New Zealand mirrored the media sentiments; offshore perception being particularly negative in the USA. We also found public sentiment may be influenced by local environmental disasters not directly related to aquaculture (e.g., oil spills). Both countries voiced concern over environmental impacts, but the concerns tended to be more generalized, rather than targeted issues. Two factors that could be inhibiting informed discussion and decisions about offshore aquaculture are lack of applicable knowledge and actual local development issues. Better communication and investigation of the real versus perceived impacts of aquaculture could aid in clarifying the debate about aquaculture, and help support future sustainable growth.

Keywords: aquaculture, perceptions, United States of America

Motives and barriers for seafood consumption: Consumer perception in five European countries

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European seafood producers have been facing increased competition from overseas and some of their products are not price competitive. In 2015, EU consumers spent €54 billion on fish and aquaculture products, thereof almost €24 billion on imported fish. The EU capture fish industry has its main challenges related to the supply of fish, both because of overfished stocks and because of the seasonality of main species. The challenges facing EU aquaculture include limited availability of sites, complex administrative and legal procedures and lack of market differentiation in terms of quality and in adapting to evolving consumer preferences. These and other challenges affecting the economic sustainability of European seafood producers are addressed in PrimeFish, a four-year Horizon 2020 funded research project with 14 participants from Europe and two outside Europe for comparative investigation. In the project, the economic performance of selected primary seafood producers will be evaluated, and the impact of consumer behaviour, market trends, innovation and product development in the seafood market will be specifically analysed. To accomplish this, information will be gathered not only from publically available sources but also from individual production companies, industry organisation, marketing channels and from consumers.

In this qualitative study, indications of positive and negative motives, perceptions, associations and attitudes towards fish/seafood, were identified with a focus on selected species (salmon, trout, seabass, seabream, herring and cod). In-depth interviews with both high and low frequency consumers were carried out in five European markets (France, Germany, UK, Italy and Spain). The results indicated both similarities and differences in these five markets. Consumption cultures, knowledge and interest in seafood varied, as did purchase behaviour and use of different products. Fish and seafood had generally a positive image but some specific concerns were raised, often resulting in change of consumption behaviour.

Keywords: consumer perception, European markets, competitiveness

Which potential for the development of (European) seafood products: an analysis of the perception of French consumers.

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The public perception of food products is considered to be a key factor for understanding and predicting the consumption patterns. In particular, in the case of seafood products, a greater awareness of some production systems has recently generated a change in buying attitudes, e.g. in the case of salmon in France. The H2020 European project SUCCESS, which aims at consolidating the competitiveness of the European seafood sector, investigates consumption patterns in several countries. Further a large online survey conducted in 8 countries, some qualitative consumers' focus groups were organized in several countries. This paper presents the preliminary findings of the focus groups conducted in France. In addition to general questions regarding the sustainability of seafood products, the perceptions of the participants regarding coastal fisheries and salmonids products are analyzed. Preferences regarding the place of origin and the production system (aquaculture vs wild; organic…) are in particular discussed.

Keywords: seafood products, coastal fisheries, aquaculture, perceptions, France

Session: 14 - Implementation of the CFP

The Future of UK Fisheries in the Context of Uncertainty

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Keywords: UK

Session: 14 - Implementation of the CFP

Competitiveness of scallopers in the English Channel

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SUCCESS is an H2020 project financed by the EC with focus on the Strategic Use of Competitiveness towards Consolidating the Economic Sustainability of the European Seafood Sector. As part of this project, we are evaluating the competitiveness of (coastal) king scallop fisheries in the English Channel. Scallops are a high value species, with scallop fisheries often specifically targeted by dedicated vessels using dredge. There are challenges that fishermen face with regard to technical measures and marine planning issues, including spatial management. There are also important challenges associated with further integrated management initiatives, especially between France and UK, and the risks associated with Brexit. Approaches to add value to local scallops, including approaches to fishing, direct sales and certification programmes increase competitiveness. This work considers the challenges on different scallop fleet segments, based on vessel size and home port, from France and the UK and evaluates their competitiveness. Further, we consider innovations that are apparent in these fleets and the value chains that they use. Results show that prices and quantities achieved by fleet segments vary significantly, showing huge differences in profitability and competitiveness. As a result of the analysis conducted, we suggest approaches for change that could improve competitiveness of vessels and fleets targeting scallops.

Keywords: king scallops, seafood trade, competitiveness

Session: 14 - Implementation of the CFP

Understanding the impact of different Brexit scenarios on the UK's fishing fleet

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While many promises have been made to the UK fishing industry about fisheries management post-Brexit, it has also been widely acknowledged that the nature of negotiations, and policy-making more broadly, confronts uncertainty and trade-offs. This paper addresses these issues by analysing the 'known unknowns' of post-Brexit fisheries management, with a focus on:

- Changes to UK territorial waters
- Changes in the UK-EU exchange rate
- Changes to tariffs and trade patterns
- Changes to decision-making on catch limits and rebuilding fish stocks

There is significant uncertainty around each variable, but it is possible to construct a range of possible outcomes, informed by analysis of fishing relationships with third countries (Norway, Iceland, Faroe Islands, Greenland) and economic modelling on the impacts of Brexit by the Treasury and other institutions. The range of possibilities for each variable are then combined in a scenario analysis to illustrate the combined potential impact in economic terms for the UK fishing fleet. The extent to which different combinations of outcomes are likely to coincide is also analysed.

As the UK fishing fleet is very diverse, and the impacts of different Brexit scenarios will have distributional impacts across different fleet segments. Two dimensions of particular importance are the export-orientation of the fleet segment (given the potential changes to trade patterns) and the size/scale (given the potential changes to territorial waters). As such, the outcomes from the scenario analysis are applied to fleet segments along these dimensions to illustrate a further set of trade-offs: those between fleet segments that may feel the impacts of Brexit differently.

Keywords: Brexit, scenario analysis, distributional analysis

SEAFISH bioeconomic model: enhanced utilisation of data available for policy support

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SEAFISH model is a result of the implementation of The Landing Obligation Economic Impact Assessment project, which started in 2014 and grew up to a separate modelling tool, which could be used for Economic Impact Assessment of different management option to the UK fleet. The purpose of the model is to provide information that supports decision-making and understanding at a fleet segment, home nation and national level.

The model consists of 3 major structural parts: Data Input Framework; Bioeconomic simulations and Data Output Framework. All parts are connected through the standard data flow and developed in R and VBA programming languages, which makes data input and results updatable when new data sets are published. The main advantages of the model is utilisation of information available from administrative and other institutional data sources (e.g. STECF FDI data base, ICES stock assessment, EU FIDES database, etc.) at lowest aggregation level available and incorporation of metier approach to economic fleet segments analysis, allowing to link economic performance indicators with activity information and gear use by area.

It is also the first model of such a scope, covering: 96 UK fleet segments (defined on the level of UK home administration, PO and fishing technique); 412 metiers (defined as combination of 10 ICES fishing areas and 9 main fishing gears) and 72 stocks.

Bioeconomic simulations are based on Fishrent methodology. The model uses the inputs required for simulations from Data Input Framework to test scenarios. So far developed and tested simulations include 4 baseline scenarios and 2 quota movement scenarios mainly focused on implementation of the Landing obligation in UK fishery. Scenarios considers the relative impact of the following policy levers: quota adjustment, catch allowance for zero-TAC stocks, vessel movement between metiers to better utilise PO quota, simulation of moving unused UK quota between fleets and simulation of end of year UK quota allocation (after international swaps).

Keywords: bioeconomic modelling, economic impact assessment, fisheries management, landing obligations, Fishrent, UK fishing fleet

SEAFISH bioeconomic model: Choke Points and Problem Stocks for UK Fleet under the Landing Obligation, 2017-2019

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This part presents the results of SEAFISH model for the main UK fishing fleets and identifies potential choke points, the most challenging choke stocks and potential quota sources that could help to delay or avoid choke.

Different simulations of what could happen in 2017-2019 have been created; four of these are referred to as baseline simulations and, based on a calculated initial quota allocation in each year, explore the value of expected policy and industry mitigation measures. The baseline simulations indicate the challenge faced by UK fleet segments, and therefore the extent of change that could be required to keep fishing. There are two further simulations which explore to what extent the UK can address some of the challenges through quota trading within the UK or through quota swaps with other EU Member States.

The choke point analysis identifies the potential impact that could occur up to and including 2019 if the challenges of choke stocks are not addressed. Unsurprisingly the greatest impact is expected in 2019 when all demersal quota stocks are subject to the landing obligation. The analysis looks at the amount of quota that might be required to address the choke points, identifying the scale of the challenge.

In studying the quota required for choke stocks under each of the simulations, and the quota requirements that remain after all simulations are tested, the characteristics of each choke stock are revealed. The findings show whether the challenge created by each stock is caused by a low estimated quota uplift compared to discard rate, a low share of UK quota, or a low UK quota. The analysis also shows the extent to which UK quota holdings can be used to delay choke points and the fleet segment's which are dependent on international swaps to support previous levels of fishing activity.

Keywords: economic impact assessment, landing obligations, fisheries management, CFP, UK fishing fleet

Small pelagic fisheries, fish meal factories and food security in Mauritania

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The Mauritanian EEZ shelters abundant fish resources, among which stocks of small pelagic fish are the most important in quantitative terms. These stocks are targeted by large-scale foreign fishing boats, but also, increasingly, by local (West-African) canoe fleets operating with purse seines. Two factors foster the increase in the demand for small pelagic fish: the increase in local human consumption, and the increase in demand by the fish meal industry, in close relationship with the growth of world aquaculture. This second factor recently resulted in the creation of fish meal factories in Mauritania, and the trend of creation of such factories is rapidly increasing. This industry was mainly fueled by pirogue fishing, but also recently by Turkish purse seiners.

This communication analyses the impact of the world increase in demand for fish meal on the activity of local fishing fleets, and on the food supply of local populations. The first part describes fishing activities in the Mauritanian EEZ, with a focus on small pelagic fisheries and small-scale fleets; it also considers the impact of these activities on the national economy. The second part analyses the markets for small pelagic fish that are landed in Mauritania, with a distinction between markets for direct human consumption and for fish meal production. The third part builds three scenarios of possible evolution for the next decade. The results of these scenarios suggest, inter alia, that an uncontrolled development in fish meal factories in Mauritania is likely to be harmful to the food security of local populations.

Keywords: Pelagic fishing; Food Safety; Flour and fish oil

Evaluating the socioecological performance of fisheries management in the Faroe Islands

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More than 90 per cent of exports from the Faroe Islands are fish products, making the fishing industry extremely important to the economy of the small country in the North Atlantic. Still, the socioecological performance of fisheries management in the country has never been analysed, partly due to a lack of data. Several different management systems have been in place in the last thirty years: entry/exit limitations were implemented in the 1980s, catch quotas in the early 1990s, and the effort quota system, which is still in place now, in the mid 1990s. This paper creates a timeline of all policy changes that have taken place in the Faroe Islands in the last 30 years and analyses the outcomes in relation to what literature predicts will come out of the management system. In order to do so, a new dataset has been compiled that includes data on fleet net profit, the number of fishermen employed, fishermen's average salary, fleet capacity (gross tonnage), vessel numbers, stock sizes, and landings for all major fleet segments. Using grey literature and media coverage of fisheries management, the outcomes of the various fisheries management systems as intended by policy makers are compared to the actual outcomes as determined by the data. The goal is to evaluate the socioecological performance of fisheries management in the Faroe Islands. The results can be used to inform future fisheries management in the Faroe Islands and serve as a case study of the socioecological outcomes of the various management systems employed.

Keywords: fisheries management; socioecological performance

Fisheries in the north of Norway – Direct and indirect effects on employment and economic activity in coastal communities

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Through firm-level data gathered from a sample of fishing-vessel owners in the northern Norwegian county of Troms, we analyze the importance of fisheries activity for employment and economic activity in the regions coastal communities. We look at the direct effects through employment, value added, and taxes paid by vessels registered in the county. Further, we estimate the fishing fleets ripple effects through contributions to revenue- and workplace creation in the surrounding supply industry.

After performing our calculations on Troms, we proceed to supplement our dataset with fishing vessels registered in other parts of Norway. With this foundation, we divide the vessels into underlying categories based on properties such as size, gear type, catch type, and so forth. For each category, we estimate an average representative vessel. This allows us to compare both direct and indirect/ ripple effects across vessel properties. As an example, we can compare the structure and size of supplier purchases across vessels of different length, or across vessels using different types of fishing gear. Next, we multiply the results for each representative vessel by the total amount of vessels in Norway sharing those given properties. This gives us a good estimate of the aggregate direct/ripple effects generated by all fishing vessels with those properties. By finally summing up across properties, we get an estimate for the aggregate direct and indirect effects of fisheries activity on employment and economic activity in the Norwegian coastal communities.

Keywords: Norwegian fishing fleet, ripple effects, coastal communities

The policy objectives of the CFP – Challenges and solutions

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The policy objectives of the CFP – Challenges and solutions

In 2009, the European Commission identified "imprecise policy objectives" as one of the "structural failings" of the Common Fisheries Policy (CFP). Through the 2013 CFP reform, Maximum Sustainable Yield (MSY) was stipulated as an objective of the CFP in order to overcome this deficiency. Nonetheless, three questions regarding the CFP's objectives remain open:

1. How can the ecosystem approach be implemented at the level of policy objectives?
2. How can conflicting (ecological, social, economic) goals of the CFP be reconciled?
3. How can the CFP's objectives be more closely aligned to stakeholder preferences?

The Thünen Institute of Sea Fisheries and the Thünen Institute for Baltic Sea Fisheries have established a joint social and life sciences research group to address these questions. Preliminary findings of the group will be presented. Based on a literature and document analysis, we first discuss how policy objectives can consider the ecosystem as a whole rather than individual fish species. This remains a major challenge under the CFP since the current policy objective, MSY, is a single-species concept. While a shift of management objectives to the ecosystem level appears necessary to take into account biological and technical interactions, it also raises distributional questions since quota distribution has so far been organised at the species level. Moreover, the ecosystem approach raises questions in how far further maritime uses have to be taken into account. Second, we discuss the conflicts and synergies between the CFP's (and potentially other maritime policies') goals. These conflicts and synergies serve to identify clusters of management objectives, i.e. objectives which can be jointly realised. Third, we address the question how policy objectives can be aligned to stakeholder preferences. This consists of three steps: First, the identification of stakeholder preferences; second, a comparison between stakeholder preferences and the clusters of management objectives identified previously; third, a discussion of instruments to compensate stakeholders whose preferences are not being fulfilled.

Keywords: Objectives of fisheries governance, social dimension of fisheries, stakeholder analysis

Outlooks for the European pelagic sector

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Keywords: European seafood sector

Fish catches in European waters could increase by 57% (or 5 million tonnes), if fish stocks were fished sustainably and based on scientific advice

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This is the result of the study Oceana released in September 2016 and that was led by renowned fisheries expert Dr. Rainer Froese at the GEOMAR Helmholtz Centre for Ocean Research in Kiel in Germany (www.geomar.de/en). The study provides the most comprehensive overview so far of overfishing in European fish stocks and their potential productivity if managed sustainably, analysing 397 stocks compared to around 150 monitored by the European Commission: The new study shows that the status of the EU fisheries is far from being in good condition, and only a minority of European stocks can be considered as well managed, with 85% of stocks in an unhealthy state and only 12% fulfilling the commitments of the Common Fisheries Policy.

This information is crucial to obtain a comprehensive understanding of the status of European fisheries and to assess the performance of commitments to the CFP, in particular the objective to end overfishing. However, the political stance of the EU is neither in line with these principles nor with the critical condition of European fisheries. EU fisheries ministers continue to disregard science and to overfish declining stocks on the basis of short-sighted socioeconomic arguments.

The potential recovery of fish stocks following sustainable management measures would mean more fish in the sea resulting in increased catches obtained with less fishing effort and less impact on the ecosystem. Among the stocks that would benefit the most from proper management, scientists calculate potential increases of 300% or greater for catches of haddock and cod in the North Sea, some herring stocks in the Celtic Seas, and sardine in the Cantabrian Sea. These catch increases will in turn deliver significant positive socioeconomic consequences for the EU fishing sector.

The benefits of sustainable fisheries management are clear and well-recorded and although some of these measures come with a short-term cost for the fishing sector, the long-term benefits to all parties are considerable.

There is a need and obligation to put an end to overfishing in the EU, and the success to achieve this goal depends on the urgent action by the Fisheries Council.

Keywords: Overfishing, Common Fisheries Policy, sustainable fisheries management

Individual transferable effort quotas for the Italian fisheries? A preliminary analysis

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Transferable fishing concessions (TFCs) remain a recurring theme in EU policy debates, and it is important for stakeholders to better understand their application and possible consequences in order to take an objective position. In the framework of TFCs, the most known tools are probably individual transferable quotas, while much less discussed is the case of individual transferable effort quotas (ITEs). This study is the result of a project supported by the Italian Ministry of Agriculture, realized in collaboration with Italian fishery associations with the objective of valuating the possible consequence of the introduction of ITEs. It has involved stakeholders through a participative approach. A survey has been carried out through a sample of key stakeholders representing bottom trawling fisheries in the Tyrrhenian and Adriatic Sea, and the pelagic trawling fishery in the Adriatic Sea. The results and elaborations of the surveys have been discussed and validated in a focus group composed by delegates of the fishery associations at regional and national level. Two aspects have been investigated: the relationships existing between fishing capacity (i.e. engine power and GT), fishing activity (i.e. fishing days and fishing hours), revenues and variable costs (e.g. fuel); and the suitability of different proposals and alternative approaches for the introduction of ITEs. Relationships among variables are essential in order to understand which vessels (i.e. large or small) would take advantage of the introduction of ITEs. However, the details of the transferability scheme may result critical. Most of the stakeholders think that large vessels would buy quotas from small vessels, but simulations demonstrate that this depends on the transferability scheme. Discussion of these themes in the focus group has permitted to increase the awareness of stakeholders.

Keywords: Individual transferable effort quotas; participative approach; Italian fisheries

Notes

A dynamic general equilibrium model for the economic assessment of EU fisheries policies

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The paper presents a dynamic general equilibrium model with heterogeneous agents that can be used for assessment of the economic consequences of di erent EU policies. These include, stock rebuilding strategies, comparison between input/output management options, capital malleability and macro-economic e ects of subsidies. The model takes into account the price system, which plays the crucial coordinating and equilibrating role in the economy. It is based on the fact that everyone in a given economy faces the same prices generates the common information needed to coordinate individual decisions. Prices (i.e. wages) balance demand and supply so that all the buyers who want to buy at the current price, and similarly, all the sellers who want to sell at the current price, can and do it, with no excess or shortages on either side.

The results provide both individual and aggregate data that can help managers in under- standing the economic consequences of these policies. In particular it provides a set of aggregated economic and social indicators (wages and household utility), capital indicators (number of vessels) and macroeconomic aggregate indicators (gross value added -GVA- and wealth). It allows to endogenously consider the capital dynamics which in fact provides and index of over-capitalization. Given that the model is based on heteregenous agents it also provides and index (Gini) of the inequality of these indicators. The model is applied to the

Western Mediterranean and provides results, both, for the steady state and the transitional phase for all the indicators explained above.

Keywords: Macroeconomics; General equilibrium model; Multiannual management plans; Subsidies

Economic assessment of BIM gear selectivity trials 2013-2016

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Over the last 4 years Bord Iascaigh Mhara has carried out numerous gear selectivity trials on Irish trawling vessels in order to evaluate various gear selectivity devices and potential changes in tactical behaviour that could ameliorate the impact of the Landing Obligation on the fleet. Trials have been carried out in mixed demersal fisheries and nephrops fisheries in both the Celtic and Irish Seas. All mixed demersal fishery trial vessels utilised single or twin rig trawls while all nephrops trial vessels used quad-rigs. For each trial the vessels were requested to fill in a trip level economic survey to assess the changes in costs related to the adoption of new selective gear.

The survey requests data on the annual activity of the vessel by fishery, then details of the fishery in which the trial takes place such as steaming time, departure and landing ports, crew numbers etc. The typical economic cost variables such as fuel costs, variable costs, net mending, food, maintenance among others are requested with additional information requested on ice and transport costs for undersized catches. The impact on labour is assessed in terms of time spent shooting gear, sorting on deck, mending gear and unloading. Finally the fisherman opinion on likely consequences of the LO are ascertained firstly in how the main cost factors will change (increase or decrease) and then the reasons behind these expectations. Preliminary socio-economic results of the trials will be detailed in this study.

Keywords: Landing obligation, gear selectivity, trip costs

Stakeholders' opinion about the Landing Obligation and transformations of Social, Economic and Ecological systems of EU fisheries

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The Landing Obligation is one of the conservation objectives introduced by the last revision of the Common Fisheries Policy (CFP) (EC Reg. 1380/ 2013). According to article 15, all species subject to catch limits and minimum landing size, for the Mediterranean, caught during fishing activities in EU waters should be retained on board the fishing vessels, recorded, landed and counted against the quota where applicable.

Adaptation to this objective requires a shift of the current social ecological system of European fisheries. For example, it will require adaptation or mitigation of social and economic system due to changes of current practices, natural system will also be changed, and the interactions between these two systems will also modify the governance system; introducing new management rules and new principles of allocation of quotas, as well as changing values and the identity of fishers and fishing dependent communities.

The current presentation uses qualitative data, gathered through semi-structure interviews with the main groups of stakeholders (fishers, administrators, representatives of EnvNGOs auction and processing industry, etc) from different member-states and Regional Seas (carried for the H2020 funded Discardless Project), to identify and discuss the main social transformations they foresee will happen with the landings obligation. It will also discuss how fishers' values prompt them to accept or not the landings obligation rule, how ENV-NGO and others stakeholders perceived and anticipated changes and the main changes which will occur on the EU governance system.

Keywords: Landing Obligation

Overfishing as a legitimate management goal

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Food conversion rates are an essential theoretical tool for the operation of aquaculture plants. The efficiency of the production chain is influenced among others by the fish efficiency – the mass surplus per assimilated food. A similar indicator, the stock efficiency as a function of fishing mortality and mesh size was now introduced for wild fish stocks. Like in aquaculture, the stock efficiency provides a measure of how much yield per food quantity can be harvested.

Fisheries targeting predator and prey fish at the same time take place in many marine ecosystems. The interdependencies between predator and prey fish were analysed on the basis of a theoretical example. It was quantitatively shown that the achievement of high total yields is only possible if the predator-fish stock is overexploited. Over-utilization leaves food resources unutilized. Under-utilization causes a larger stock size and consequently a lack of food for the remaining fish. The fish cannot feed at the maximum consumption rate because the ecosystem is not able to produce enough food. That is compensated for by lower growth rates or by cannibalism. In the case of starving fish we know from aquaculture that the fish efficiency and thus the productivity of the aquaculture plant decreases. Similar results are obtained for wild fish stocks. Fishing with small meshes and high fishing mortalities results in a high stock efficiency, and therefore, in larger catches per food quantity. It is clear that recruitment must be closely watched when applying such an exploitation pattern. Fishing with small meshes and high fishing mortalities were successfully used for a long time within the so-called balanced harvesting approach. It is known that much larger total yields are possible employing balanced harvesting compared to yields obtained by single stock optimization.

Keywords: Stock efficiency, food per recruit, yield per recruit

Within-year modelling of gear changes in the Irish Celtic Sea whitefish fishery

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To understand the bioeconomic impacts of gear changes in response to the EU Landing Obligation, it is important to integrate results of gear trials into models on appropriate timescales. Timescales must reflect: biological, fishery, management and economic processes. Traditionally, the potential effects of gear modifications were assessed on an inter-annual basis, which may be inaccurate where species and fisheries have seasonal dynamics. In particular, for fast growing species, a recruiting cohort may pass through a selectivity window within a season and ignoring this possibility with an annual time-step will generally bias inference on the potential effects of gear modifications (Kraak et al., in prep). Here, we begin to develop a framework for bioeconomic investigation of the effects of gear changes in the Irish Celtic Sea whitefish fishery. A flexible length-based framework for modelling within-year growth and mortality is proposed. We implement a monthly time-step as an appropriate compromise reflecting growth dynamics of the species (cod, haddock and whiting), broad-scale effort allocation, quota allocation and seasonal price dynamics. The approach we suggest is more aligned with the timing of key processes bringing science and operations a step closer but, importantly, can be linked to longer-term decision support tools addressing broader implications. Challenges in conditioning the model include: 1) resolved catch-at-length data to develop representative catchabilities; 2) development of representative uptake scenarios; and 3) multi-source variance and uncertainty propagation. Such challenges should be overcome to understand the impact of gear changes and assist regions in addressing challenges of the CFP reform.

Keywords: Landing Obligation; choke mitigation; short-term bioeconomic implications

Producers organisations, cooperation and fisheries sustainable development: The Portuguese Case

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Political Economists' understanding of Sustainable Development shapes perceptions of resource degradation problems and prescriptions recommended to solve them. In this context, Elinor Ostrom's research is fundamental in the substitution of the "Tragedy of the Commons" metaphor to the more interesting "Drama of the Commons". Of course we'll have tragedies, in the open access regime situation. But, sometimes, we'll have also reasons to laugh. Ostrom (1990) stresses that a commons can be well governed and that most people, when presented with a resource problem, can cooperate and act for the common good. "Co-management" and self–regulation are the keys for sustainable resource management.
The Nobel Prize attributed to Prof. Ostrom originated an important movement of re-visitation of the concept of cooperation and its effects. This issue is particularly interesting when thinking about sustainable use of natural resources. Our aim is to address this issue with a particular reference to the fisheries case. Starting from the "Commons Tragedy" theoretical framework, we try to underline the factors that, in a situation of res-communes property-rights regime, concurs for the exit of sustainable use of resources. In methodologic terms we use the case of Portuguese Fisheries Producers Organizations to address this problematic, through the analysis of the information contained in several publications, related sites and interviews made with the leaders. The fundamental results suggest robust social capital and leadership as the key factors for the success of this experience of "Co-management".

Keywords: Fisheries, Cooperation, Producers Organizations, Common Fisheries Policy

Comparative study on the economic integration of access regimes in industrial pelagic fisheries: What are the inputs to the management of this fishery?

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Comparative study on the economic integration of access regimes in industrial pelagic fisheries: What are the inputs to the management of this fishery?

This comparative study aims to evaluate the economic integration of the pelagic industrial fishery into the Mauritanian economy. The pelagic industrial fishery operating in the Mauritanian Exclusive Economic Zone (ZEEM) is subjected under the Mauritanian Fisheries Code, to two access regimes: chartering and free licenses.

The comparative study of the two systems shows that the free licensing system contributes more to the budgetary revenues of the fisheries sector, in terms of monetary value, than that of chartering, ie 6.6% of turnover against 2.02%. This notable difference is due to the large production capacity of licensed vessels.

Overall, if the profits (state revenue, salaries, insurance and charterers) of Mauritania as a percentage of the turnover are reported, the percentage of the charter is more significant 21% against 6.67%. So foreign shipowners earn for chartering 89% and free licenses 93.33%.

Moreover, in the field of employment, the free licensing system contributes even more to the industrial fisheries sub-sector, ie 9.5% against 1.7% only for chartering. Even the percentage of Mauritanian seamen on board vessels with license exceeds that of chartering by 28% and 20% respectively.

Compared to the social inclusion clause in the contracts, there is a greater loss of jobs for the 30% charter system, while the free license is only 7%.

Keywords: economic integration, industrial fishery, access regimes, chartering, free license, development

A Case for the Commons: The Snow Crab in the Barents

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The open access harvesting of the invasive but commercially valuable species, C. Opilio (Snow Crab) in the Barents Sea generates a positive externality by slowing the spread of the species into sensitive benthic ecosystems. Reclassification of the species to a 'sedentary species'[1] shifts the regulatory environment so that the crab no longer resides in international waters but is now part of the extended Russian Continental shelf, subject to Russian harvesting regulations. We argue that, as the Russians have maintained a closed, limited experimental fishery for C. Opilio, the positive externality of the open access harvesting will disappear, hastening the spread of the crab. The spread to new areas has both known ecosystem and commercial fishery risks and unknown risks, particularly to uncertain ecosystem values. Therefore, not only will knowable damages accrue more rapidly, there is less time for research and evaluation of ecosystem risks and damages about which we currently have poor understanding. The question of whether the capture of resource rents by Russian fishing interests is greater than global losses from the spread of the invasion westward is an open one complicated by standard bio-economic concerns regarding profitability in fisheries but also by several intriguing property rights and game theoretic questions. As the global fishing commons has shrunk over the past half century, we have seen how the details matter in determining the net benefits of what simply applied economic theory would define as a clear boon. We delineate and examine this complex story here in order to bring awareness to dimensions of commons management that the literature has yet to address.

Keywords: Open-access fisheries, Bioeconomic modeling, Invasive species management

Good and bad poachers: lessons for the shellfish resources management from Galician Shellfish gatherers communities

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Shellfish poaching in Galicia is a common, endemic and wide spread phenomenon, that being pointed out as the most important threat for the Galician shellfish sector (Ballesteros et al., 2013; Sequeiros, 1995). Given the socio-economic importance of shellfish in Galicia, the appropriate management of the shellfish resources, including the effective combat against of poaching, has become in a central issue for the Galician Government.

In Galicia the shellfish sector is ruled by a combination of formal rules and informal institutional arrangements that combined could manage local resources in an effective and adapted way. In this co-managed framework has been detected some informal arrangements that could be used by the shellfish communities to allow some poaching extractions. That means that under the point of view of the rules that govern these communities there are "good poachers", those who are allowed to poach, and "bad poachers", those which behavior is unacceptable.

The main objectives of this work were identified and unravel in which cases and under which specific conditions the shellfish poaching could be accepted in galician shellfish communities. To accomplish this task were conducted 48 in-depth interviews and applied a representative number of surveys (55) to relevant informants of Galician fishermen's Confraria.

Keywords: Shellfish; Poaching; Community Based Management

Assessing the technology and technical efficiency of artisan fishing boats

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This paper uses a stochastic frontier approach to estimate the technology and the technical efficiency of the artisanal fleet in the island of Gran Canaria. Since we are interested in finding which variables explain the differences in technical efficiency across boats, we estimate a model that allows technical inefficiency to be a function of some explanatory variables. While some papers have recently applied these types of models, we use the Hadri (1999) model. To the best of our knowledge, this is the first attempt to apply this model to fisheries data.

One of the main interests of our research is to analyze the effect on catch landings of the variables that can be easily modified by the fishermen. In particular, we are interested in analyzing the role of days spent fishing. In Gran Canaria there is a great variability in the number of fishing trips per month across boats and we would like to assess the possible effect of regulating days at sea in order to reduce fishing effort.

Keywords: Small-scale fisheries, boat efficiency, stochastic frontier, panel data

Promoting coastal fisheries products in a competitive environment: the French case of the seabass Breton label “Bar de ligne de la pointe Bretagne”

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Coastal fisheries, characterized by an important proportion of small-scale boats, are facing various difficulties (STECF AER, 2016; Josupeit, 2016) according to stocks or market competition. Indeed, this fleet is targeting species also fished by larger vessels or conversely by recreational fishers. In this context, coastal fisheries have to cope with European and global competition, especially as some coastal species are also farmed by aquaculture industries. This means the coastal fisheries products are presented to the consumers among large-scale production and aquaculture products. Last difficulty is the fact that these fishes can be consumed fresh or frozen, which at the end of the chain value, makes the consumer unaware of the origin of the fish products. In France, and more precisely in Brittany, seabass is a good example of coastal fisheries challenges (Drogou et al., 2011). Note that seabass fisheries sustainability is one of the coastal fisheries analyses of the European H2020 SUCCESS Project (www.success-h2020.eu). Facing this multiple competitor’s context, the association of Brittany seabass liners created a label – Breton Liners (Ligneurs de la pointe de Bretagne) - at the beginning of the 90’s to help consumers identify their products. By symbolizing the geographical origin and fishing techniques of the vessel, the brand underlines the quality of their products which should lead to a price-premium (Boude, Charles et Gouin, 2005). Thanks to French data from the SIH database (sih.ifremer.fr/) covering the 2000- 2013 period, we will test if the development of the label has been a positive tool to promote the small-scale seabass products. Do the labelled seabass liners receive a higher price? Our presentation will be organised as follow. We’ll begin by presenting the creation of the label: its origins, objectives and functioning. Then, we’ll present the data used and the statistical ANOVA method. Results will be twofold: on one hand, descriptive statistics and the presentation of the actual seabass chain value in France will enable us to describe the competitive context faced today by the liners, and on the other hand the results of the ANOVA analyses will confirm or not the existence of a price-premium due to the label.

Keywords: seabass, label, fisheries, aquaculture, international trade, consumption, price, chain value, ANOVA

Added value of nutrient neutral growth in Finnish aquaculture sector by nutrient recycling

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Eutrophication is one of the main threats to the biodiversity of the Baltic Sea and it is caused by excessive inputs of nutrients to the marine environment. Aquaculture production is one source of anthropogenic nutrient loadings and conservation needs has led to a stringent environmental policy that has restricted aquaculture production in Finland. On the other hand fishing has a positive externality by removing nutrients from the Baltic Sea. This creates an opportunity for sustainable blue growth in fish farming by recirculating nutrients in the Baltic Sea. The Baltic Sea fish feed is designed to close the nutrient loop in the Finnish aquaculture industry. Using under-utilised fish stocks in the Baltic Sea to produce fish feed for fish farming enables nutrient-neutral production growth in aquaculture if the amount of nutrients in the harvested fish for feed corresponds to the nutrient loading from the fish farming using Baltic Sea fish feed. This approach would create new demand for under-utilised fish stocks and increase value added in fishing and aquaculture sectors.

In this paper we analysed the value added created along the whole value chain by increasing rainbow trout farming by 10 thousand tonnes according to Finnish aquaculture strategy using Baltic Sea fish feed. The results show that the estimated overall value added – from fishing to retailing – adds up to €39 million. And all this added value is gained by sustainable nutrient neutral growth in fish farming.

Keywords: Aquaculture, externalities, blue growth, nutrient recirculation

Determinants of specific carp supply chain in the Lower Silesia Province in Poland

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Research in the framework of the European Union project Horizon 2020: "Strategic Use of Competitiveness towards Consolidating the Economic Sustainability of the European Seafood sector" (SUCCESS) aimed to determine the economic and organization conditions of production and supply chain of carp in the Lower Silesia region - in particular in the Barycz Valley, where is located the largest carp breeding centre in Poland and the whole Europe.

It identifies its dynamics, searching for suppliers process, contracting agreements, problems related to the sale (transaction costs), cooperation with other stakeholders and potential losses associated with storage, loading and transport.

The research was conducted by in-depth interviews with participants of the supply chain on the carp market in the Lower Silesia at each stage.

The results show that the carp supply chain in the Lower Silesia Province is heavily dependent on consumption habits of Poles (80-90% of sales (especially wholesale) takes place in the period of the Christmas Time), which only from a decade slowly but surely are changing. New supply chains are related to the diversification of fish farming activities by putting emphasis on angling, catering and recreation development as well as the export to UK or Ireland because of the massive migration of Poles to those countries after 2004.

Keywords: carp supply chain, diversification of carp farm activities, Poland

The salmonid industry cost of controlling the spread of pancreas disease in Norway

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The Norwegian salmonid production is affected by serious infections disease outbreaks that affect both production- and trade volumes. One of the major diseases affecting the Norwegian production of Atlantic salmon (Salmo salar L.) is pancreas disease (PD), a disease which results in increased mortality, lower growth rates and reduced fillet quality. The causal agent, salmonid alphavirus (SAV), is an OIE-listed agent and its presence may thereby affect international trade patterns from affected areas. SAV is endemic within the salmon farming areas of Western- and Mid-Norway, while only sporadic outbreaks are seen in Northern-Norway. The regulations in place for controlling PD define two adjacent endemic zones, and an observation zone that is located between the endemic zones and the non-endemic, northern area. In addition to regular SAV-screening in the observation zone, the regulations require depopulation of any SAV-infected sites outside the endemic zones. SAV-infected fish populations may be relocated to a site within an endemic zone or, alternatively, slaughtered or destroyed depending on the size of the fish. The relocation option is dependent on the availability of an empty site and transport capacity, features that are unevenly distributed between producers. While the regulations have managed to largely control the spread of SAV beyond the endemic zones, sporadic outbreaks are seen in the observation zone and the non-endemic area. The farmers carry both the SAV-screening costs and the costs associated with depopulating, disinfecting and fallowing an affected site. The results from a cost-benefit analysis assessing the two management options (relocation versus slaughter/destruction) will be presented, based on data from affected sites after the introduction of the current legislation. In addition, an estimate of the effect on associated industries will be included. Finally, some potential incentives will be discussed.

Keywords: aquaculture, policy, cost-benefit

Who has the right to fish? The distribution of fishing opportunities in Europe

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Within the EU there is a wide array of systems used for allocating access to fisheries. In this report, twelve EU Member States are selected and a descriptive account of their allocation systems for quota and other fishing opportunities is provided. These systems can broadly be classified according to the allocation method, holder, transfer properties, security, and duration of fishing rights. Many Member States opt for split systems depending on the fishing fleet or quota species.

To assess whether these systems are 'successful', a framework of objectives is constructed, based on features that can be defined as necessary or practical for a fishery and complemented by additional objectives as specified by government management documents.

The performance of each Member State's fishing fleet is then assessed against performance indicators to determine if the objectives in the framework are being met. Wherever possible, fleet performance is compared across Member States. The results show room for improvement – on both absolute and relative standards – for all twelve Member States.

Based on this analysis of objectives, as well as interviews conducted with stakeholders and experts in each Member State, policy recommendations are provided. Wherever possible, reforms are proposed that keep each Member States' unique system in tact, rather than radical overhaul or a standardisation of systems regardless of context. The recommendations also incorporate best practice from systems used in EU Member States and globally. Some recommendations include legal clarity on the ownership and length of fishing rights, a re-allocation of quota to the small-scale fleet, a landings tax to recover costs of management and resource rent, the creation of an online peer-to-peer system for swapping quota between fishers, and a quota reserve to target and incentivise fishing practices that maximise socio-economic benefits or minimise environmental harms.

Keywords: fishing rights, quota allocation, Article 17

Trial auctions in the Faroe Islands in 2016

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The government of the Faroe Islands is reforming fishery policy based on the principle that fish in the Faroese EEZ belong to the nation. This implies that access to fishing opportunities should be allocated on the basis of willingness of firms to pay for the right to fish. Sealed bids indicating the royalty they would pay on the value of fish landed would break the current quasi-monopoly access that is the result of gifting quota to those with fishing history. It would also allow for new entrants into fishing. While deliberations of the new policy are still underway, the government held several small trial auctions of fishing access in 2016 for both pelagic and demersal stocks. Auctions were both executed as sealed bid and open ascending auctions. These auctions generated a much higher level of royalty income (resource rent) than was expected, and they provided valuable information on auction design. In these trial auctions, only current quota holders were allowed to bid, and royalty rates differed across pelagic stocks and demersal stocks. Differences in royalty rates were in many cases driven by the level of competition between fisheries companies. The government of the Faroes is also planning to conduct trial auctions of fishing rights for 2017, with significantly higher quantities than in 2016. In this paper we will describe the process of fishery reform in the Faroe Islands, we will analyze and discuss the results of these experimental auctions, and we will summarize the continuing discussion over a new regime of royalty auctions for access to Faroese fisheries.

Keywords: Auctions, fishing rights, and fishery policy

Lessons from the “Turbot War”; The future of high seas governance

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Memory is important, also for Economics. The ephemeris can be used not only as moments of who relives the past in a single-rewind-perspective but of those who use these occasions to reflect on the past and to project the future from it. 1995 was a special year for fisheries in Portugal. Never before, and never again, was the sector so under the eye of the midia. The cause was a fish war in the NAFO area, between Spain and Canada, about the turbot.

Two decades after the war, our proposal goes through resume the so-called turbot war and, from it, to reflect on its causes, how the problems were solved and to outlook for the guidelines of future research. That makes, also, us to think about the important contribution of Game Theory to the analysis of High Seas fisheries management.

Our paper has the following structure. In the first points, the original problems of High Sea fisheries management and how they reflected in practice in the turbot war, are presented. In the subsequent section we reflect on how the problem was solved. We shortly review the basic theoretic results of the literature, in particular those arising from the usual combination of the basic model of fisheries management with Game Theory. In empirical terms we draw attention to the diplomatic efforts between EU and Canada to overcome disagreements and to promote a cooperative agreement that would avoid the problem of overfishing on the High Sea. The rationale and substance of the 1995 UN Agreement on Transboundary Resources and Highly Migratory Species, its strengths and weaknesses, is presented and discussed. Finally, in the last section, the paper reflects on the theoretical and practical issues that still pose important questions to this problematic and ask for some perspectives on future developments.

Keywords: Turbot-War, Game Theory, Straddling stocks, High Seas Governance

Institutions, power and agency - The socio-economic interface of fisheries governance reform

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Policy prescriptions for fisheries governance reform have largely centred on exclusive individual or community rights of access to resources and the identification of ‘best practice’ models of institutional arrangements to improve environmental sustainability and economic efficiency. This focus tends to downplay the role of actors beyond fishers, the critical role that agency and relationships play in mediating access to, and use of, fish and the dynamic nature of these relationships. As a result, it is argued, the ability of many current prescriptions to deliver environmental sustainability and socially equitable outcomes is likely to be compromised. For example, drawing on environmental entitlements, capabilities and actor-oriented approaches highlights the critical role of relationships, the dynamic nature of institutional interplay and the ways differently positioned social actors’ seek to access and benefit from resources. The argument is made that environmental sustainability and social justice might be enhanced if relationships could be integrated into policy processes as the basis for more deliberative approaches to governance reform in three key ways: 1) by recognising how relationships between actors, and between actors and institutions, have shaped (and continue to shape) the specific sets of governance and institutional arrangements that mediate control over fisheries resources; 2) by considering the ways in which these historically situated mediating factors might impact on both fisheries reform objectives and human wellbeing; and 3) by recognising the critical roles that individual knowledge and values play within a specific context in determining the nature of relationships.

Keywords: Entitlements; capabilities, sustainability

Cooperative vs Non-Cooperative Benefits in the Black Sea Anchovy Fishery

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The Black Sea anchovy, Engrauilus encrasicolus ponticus (Alexandrov, 1927), the fish species implying the Black Sea fishing culture, is no doubt the economically most important harvested species in the Black Sea. The stock has been shared by the 6 riparian state in the region, mainly, by the Turkish fleet followed by Georgian and Ukrainian fleets. The first aim of this study is to conduct a simple optimization for the effort by Turkish, Georgian and Ukrainian fleets. Secondly, we will construct a cooperative and non-cooperative game theoretical model to determine net present value flow over the time period. Further, different coalitions within the game would be investigated to better understand the benefits of whole cooperation, partial cooperation or free riding is beneficial for the players or not. For this purpose, the surplus production model results from the existing literature was used to construct bioeconomic model. Recent available economic parameters from the literature and from on-site face-to-face interviews with the fishermen were used to constitute the economic extension of the biological model. The outputs of the model will be analyzed comparatively among different game models. The results are supposed to better understand the current share of benefits for the purpose of establishing good management practices for the Black Sea anchovy fishery in the Black Sea region.

Keywords: European anchovy, Black Sea, cooperative and non-cooperative games

Can coastal fisheries coexist with seals?

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The small-scale fishing sector in Sweden is rapidly declining. This has consequences for cultural heritage in small fishing communities and reduces the availability of locally produced fish. This development has several explanations, but one frequently put forward in the debate is the growing seal populations. Seals scare the fish, they feed directly from the nets, and they cause damages to the gear to an extent that is difficult for the fishing sector to handle. At the same time, growing seal populations is an example of successful management and the seal is a symbol of a thriving eco-system. Swedish fisheries interact with three species of seals; the grey seal (Halichoerus grypus), the harbor seal (Phoca vitulina) and the Baltic ring seal (Phoca hispida). In a study of the seal-fisheries interaction, questionnaires were sent to Swedish fishermen in 2013 and 2014 where the fishermen were asked to provide information about the economic costs caused by seals. The costs are split into costs for mending and replacing nets, and additional working time spent due to the interaction with seals. Results show that the total cost for seals vary considerably among different fisheries, and could be as much as 10-15 % of total revenues for some. As expected, trawl fisheries are not affected, while the cod fishery with passive gears (net and hook) in the Baltic Sea is among the fisheries with highest costs. The results from the questionnaires will be compared to key economic indicators and presented based on different gears and regions in order to determine the importance of seals for the economic viability of the small-scale fishing sector along the Swedish coast.

Keywords: Small-scale fisheries, seal, cost

Fish trap impacts in the Red Sea

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In recent years the usage of fishing traps, locally called "gargoor", has increased in the Saudi Red Sea. This work aims at understanding the status and potential impacts of the trap fishery along the Saudi Red Sea coast. First, data were collected, compiled and prepared. Then, under a management strategy evaluation framework, Saudi fisheries were analysed from a multi-fleet and multi-stock perspective using the FLBEIA toolbox. The fleets were defined according to the fishing sector: traditional and industrial. In particular, the traditional sector was separated into eight fleets with one or two métiers each depending on the region (Tabouk-Maddenah, Makkah, Aseer and Jizan) and the fishing gear (trap and others, where handlines and gillnets were included). The Saudi Red Sea fisheries were considered 'data-limited', thus data availability prevented the use of individual species, and seven major families of species were selected. These families accounted for the majority of the total Saudi catches in the Red Sea. The management strategies evaluated were based on input-control measures, in particular, increasing or decreasing fishing effort. Overall, fifteen management scenarios were compared according to a wide range of bio-economic performance statistics representing not only the sustainability of the families of species, but also the profitability of the fishing sector. The variation of effort of those fleets that use traps impacted not only on traps fishery, but also in the rest of fisheries. Under the 2011-2012 effort scenario the biomass of all the families decreased from 2006 to 2026, suggesting that these effort levels might not be sustainable. The most sensitive families to the changes on effort of traps are rabbitfishes and parrotfishes. The overall income of all fleets in 2026 reaches its maximum when trap effort is doubled and its minimum when there is no effort on traps.

Keywords: Red Sea, traps, bio-economic impact assessment

The bioeconomics of the north Irish Sea razor fishery

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This paper aims to demonstrate the possible bioeconomic equilibria of the north Irish Sea Razor Clam fishery using the standard bioeconomic theory. Due to lack of data for this fishery some data has been simulated and so contains degrees of uncertainty. Through an iterative process these data simulations have been developed to reduce uncertainties. In order to assess the bioeconomic equilibrium of this (or any) fishery, data on effort, landings, biomass, price of fish and cost of effort are required. Annual landings from 1998 are present so time series for effort and biomass must be estimated.

With this estimated data the fishery is analysed in terms of the sustainable yield and sustainable revenue curves as detailed in Anderson and Seijo (2010). The development of this fishery is plotted graphically and confirms reports of significant increases in effort in most recent years. The causes and quantification of this increase in effort are discussed for this fishery with suggestions for improved management.

Keywords: costs; mixed fishery disaggregation; effort management, multispecies

Economic performance of the UK king scallops fishing fleet

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Since 2008, the economic importance of king scallops for the UK fishing fleet increased and they are currently among the five most important species in terms of value landed. The fishery is mostly managed via input control and technical measures (gear restrictions, landing sizes and seasonal closures varying between sea areas). There are also effort limits in ICES Area 7 for boats over 15m length. Given its economic importance to the UK fishing fleet and recent industry reports on falling landings and profitability, the UK king scallop fishery is increasingly becoming a focus of future management.

The present analysis was conducted to address existing knowledge gaps on how the fishery evolved from 2008 to 2015. The analysis was performed on individual vessels trip data (logbook information) and covered all UK vessels which used dredges for which king scallop was the main source of income (at least 60% of annual fishing income). Logbook data was combined with Seafish's annual costs and earnings survey data to get a full assesment of the activity and economic performance of the UK king scallop fleet. The results include fleet technical characteristics, spacial distribution of activity, economic performance indicators and the main drivers behind the trends observed.

Results show that fishing effort for king scallops (in terms of days at sea) increased by 37% from 2008 to 2015. Landings increased up to 2012 and declined afterwards despite increasing effort. Thus the technical efficiency of the fishery (weight and value of landings per unit of effort) declined after 2012 throughout UK waters and spatial shifts in activity were observed. Operating profits of king scallop vessels dropped in 2013 and 2014 due to reduced efficiency but lower fuel prices and increasing scallop prices helped operating profit to recover in 2015.

Keywords: King scallop, economic performance, technical efficiency

Economic performances and sustainability related to use of innovative feed in aquaculture: empirical evidences from the Italian farming

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Economic and environmental sustainability of aquaculture highly depends on nature and quality of feed used. Indeed feed is one of the item that generally mostly affect cost in this sector, contributes to ensure fish health and quality, and it is a possible source of water and ecosystem pollution. Therefore, research needs to find alternative solutions able to limit environmental burden and to contain farming costs. At the same time, feed alternatives can allow a better quality of commercial products with probable evidences on prices. The AGER Consortium has granted a research project aimed to evaluate innovative feed in aquaculture and their economic implications, bearing in mind that the fish feed industry urges valid substitutes for fish meal as protein source. This goal must be achieved by ensuring fish performances and robustness, and a control of the food quality as well as a minimization of the environmental impact.

According to the project finalities, this proposal aims to estimate how feed weights into the total farm cost structure and the possible effects on revenues, costs, and management related to introduction of innovative diet. More specifically we evaluate economic effects derived from introduction of three different sort of alternatives as substitute of protein sources: 1) vegetable meal; 2) poultry waste meal; and 3) insect meal. Furthermore we evaluate the system sustainability on the basis of different technical alternative hypotheses. The baseline scenario is described using a balance sheet analysis carried out on Italian farms specialized in two different activities: sea-bass and trout farming. The baseline scenario would allow us to estimate benefits depending on use of innovative feed, also calculating the "shadow prices" of this essential raw material.

Keywords: alternative feed; balance sheet analysis; shadow prices

Estimating the European Publics' Value for Sustainable Aquaculture in Europe - A Country Comparison

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European aquaculture so far fails to reach the growth experienced elsewhere in the world and the EU aims to stimulate the industry by focusing on a high-value niche for sustainable production. Integrated Multi-Trophic Aquaculture (IMTA) is an alternative to monoculture of fin fish species, in which several species are combined in the production process. This can have environmental advantages such as a lower environmental impact through nutrient cycling and natural filters; and can have economic advantages consisting of increased efficiency, product diversification and potential price premiums of consumers. A choice experiment (CE) was conducted through an online survey in five different countries across Europe. The CE was used to assess how consumers make decisions on what type of salmon to buy based on the attributes of the product. The survey also covered consumers' attitudes towards aquaculture and seafood. Analysis of the survey data assesses the willingness to pay for more sustainable produced seafood through a Latent Class model. It was found that European consumers have a positive WTP for sustainability in seafood production. In the experiment, an ecolabel was used to distinguish between regularly produced (monoculture) products and sustainably produced (IMTA) products. European consumers showed a positive attitude towards the development of such an ecolabel.

Keywords: Sustainable Aquaculture, Choice experiments, ecolabels, IMTA, Willingness To Pay

How to maintain Carp Farming in Europe – A Matter of Region-Marketing?

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A stagnating demand limits the market, diseases and fish predators raise mortality rates, a lack of skilled successors endangers the future maintenance, hot summers lead to shortage of water; nowadays carp farming in Europe is not a grateful business. At the same time, carp farming is seen as a sustainable practice, which provides environmental and cultural services to the community. How to maintain this type of traditional aquaculture in future?

Within the scope of Horizon 2020 Project SUCCESS , our presentation looks at two different European carp regions: The Aischgrund in German Bavaria is characterised by hundreds of small family farms and Barycz Valley in Polish Lower Silesia, which production is pre-dominated by 28 larger scaled farms emerged from former collective enterprises. Using the typical farm approach originated from agricultural economics, our study first benchmarks the economics of Polish and German carp farms. Following the farm benchmarking qualitative face-to-face interviews with local opinion leaders carry out the room for improvement for future carp farming in the regions.

German smallholders struggle because of high fish losses caused by predators and an imbalance in supply chain relationship expressed by low wholesaler prices. A typical Aischgrund carp farmer can only survive economically, because he has income from non-aquaculture activities. The situation of Polish farmers is not as dramatic. The farms are more professional, cost effectiveness and able to use various sale channels. But, the region Barycz Valley suffers from rural depopulation. In both regions stakeholders and entre¬preneurs have started to establish a region-marketing, within carp farming is its unifying leitmotiv. Marketing instruments like PGI certification, fish harvest parties, innovative products etc. create new business opportunities for carp farmers like angling service, local fish gastronomy, guided group travels, carp hiking tours etc. and enhance the attractiveness of the region.

Keywords: Aquaculture, Carp, Costs, Marketing, Non-Market Values

Estimation and Analysis of Technical Efficiency of Aquaculture in China

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Based on stochastic frontier analysis, this paper estimates the technical efficiency of aquaculture in 29 provinces and cities in China from 2007 to 2014. Based on this, the output elasticity of each input factor and the influencing factors of technical efficiency are analyzed. The results show that the whole of aquaculture in China is in the stage of diminishing returns to scale in 2007-2014, but the sum of the elasticities of the three input elements increased year by year. The average technical efficiency of aquaculture was 0.6615. Although there was fluctuation, the whole showed an upward trend. There were big differences in technical efficiency among different regions. The processing rate of aquatic products, net export of aquatic products, per capita aquaculture area and the number of technical extension agencies have significant impacts on technical efficiency.

Keywords: aquaculture, technical efficiency, stochastic frontier analysis, output elasticity

Small-scale fisheries in Europe: challenges and opportunities for the future

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Small-scale fisheries (SSF) are an essential component of European Union (EU) food security and provide important economic, social and cultural benefits for coastal communities throughout Europe. Around 85% of EU fishing boats and more than half of EU fishers (90,000) are directly engaged in SSF (which are important both in the south and north of Europe), and landings from this sector are worth around 2 billion euros annually, i.e. 25% of the revenue generated by EU fisheries. Although historically European SSF have received relatively little attention, with EU fishery policy focusing mostly on large-scale fishing, the need for sustainable SSF is becoming widely recognized in EU and international policy, e.g. 2014 reform of the Common Fisheries Policy (CFP), the FAO Code of Conduct for Responsible Fisheries, and the Voluntary Guidelines for Securing Sustainable Small Scale Fisheries in the Context of Food Security and Poverty Eradication. European SSF face challenges related to governance, inadequate management measures, competition for space access (and consequent conflicts), impact from conservation initiatives and zoning, profitability issues, and market access. Opportunities include innovative marketing strategies for adding value to SSF product and improve their market access, new management tools to increase interactions between SSF and other marine economic sectors/resources uses, increased participation on management. This paper will focus on examples from around Europe to discuss the challenges and opportunities for the future of European SSF and gives examples of initiative with potential to contribute to a sustainable, economically viable and profitable SSF sector.

Keywords: governance, Europe, social

Session: 24 - Special session; European small-scale fisheries:
valuation and interaction of recreational and commercial fisheries

Understanding grassroots' factors explaining influence of the small-scale fishing segment in fisheries management in the European south western waters

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The specific issue of Small-scale fishing (SSF) segment was pointed in the EC Greenpaper in 2009 and the CFP has adopted a preferential treatment for this segment. The present study allows understanding factors that enable the SSF to influence fisheries' management in the south western waters of the European Union.

The study consists in 161 qualitative field interviews among fishing organisations (107) and fishers (54), analyzed through a thematic analysis. SSF was defined as under 12m boats without distinction of the main gear. The field interviews' sample was designed based on the distinction between areas with different percentages of SSF.

The report is structured around 7 main parts which follow a logical path from the field situation (fisher) up to analyzing the capacity of fishing organisations to influence the decision-making process. From analyzing composition of fishing organisations management boards, it does not appear that SSF is under represented. Fours main levers explaining influence of the fishing organisations have been evidenced: important membership and unity, economic weight, soft power (expertise, social capital). Creating power balance (political lobbying, medias, justice) was quoted as the last option. Some quantitative approach was proposed, scoring the different characteristics of the fishing organisations. Through a multiple correspondence analysis, it appears that that influence is closely linked to the size of the organisation and the number of postgraduates within the staff.

In addition to potential projects to empower SSF, the EU CFP should focus more on effort management, and spatial management for coastal areas, which would mechanically throw SSF into relief.

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valuation and interaction of recreational and commercial fisheries

The evolution of SSCF representation in Ireland and how the EFF/EMFF has supported this, through the eyes of an Irish SSCF

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Keywords: SSCF, EMFF

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valuation and interaction of recreational and commercial fisheries

Socio-Economic Importance of Small-Scale Fisheries in EU Fisheries Coastal Communities

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There is a lot of uncertainty on the importance of small-scale fisheries and the employment they generate in local communities dependent on fisheries. Even if the importance of small-scale fisheries and fisheries dependent communities is constantly emphasised in the EU's Common Fishery Policy, they often receive too little attention. In this study we investigate the direct employment and Gross Value Added that small-scale fisheries generate in the EU, at the aggregated level and for communities dependent on fisheries. Results show that small-scale fisheries are responsible for 2/5 of the total EU fisheries employment and 1/4 of the total GVA produced by the fisheries sector. Moreover, small-scale fleets are responsible of the more than 50% of the employment in almost 2/3 of the identified fisheries dependent areas. However, the importance of small scale fisheries varies enormously by community.

Keywords: Small-Scale Fisheries

Impact of individual fishing quota on small scale fisheries in the Gulf of Mexico

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The Gulf of Mexico red snapper individual fishing quota program was implemented in 2007 to reduce overcapacity and eliminate derby fishing conditions in the commercial fishery. The five-year review of the program reveals that the number of vessels and fishing trips declined by 17% and 29%, respectively. The review also found the fishery was open year round for the first time in 20 years. Between 2007 and 2011, inflation-adjusted dockside, allocation (leased quota), and quota share prices rose by 7%, 37%, and 145%, respectively, suggesting the profitability of the fleet improved. Gini and Herfindahl-Hirschman indices indicate the distribution of shares is highly unequal, but shareholders do not have market power. The absence of quota overages and lower aggregate discard levels suggest resource stewardship improved. However, discards in the eastern Gulf remain high due to stock range expansion and insufficient allocation. This article also describes lessons learned from the five-year review.

Keywords: fishing quota, SSCF

Enhancing Small Scale Fishing Sector's participation in decision-making

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The main objective of this work is to get knowledge about the 300 organizations and bodies that represent the EU´s Small Scale Fisheries (SSF) at local, regional, national and European making-decision levels. The scope of this work is limited to the geographical area of South Western Waters area (ICES zones VIII, IX and X (waters around the Azores)), and CECAF zones 34.1.1, 34.1.2 AND 34.2.0 (waters around Madeira and Canary Islands). The work also aims to identify and catalogue the degree of representation and involvement of the small scale fishery sector in the different decision-making processes. The culture or philosophy of developing a more participatory (including all the stakeholders) in the decision making process could conduct to a new governance of the South Western Waters area, which is especially relevant in the case of the SSF.

This work uses governance structure diagrams reflecting the flow of fishery information/ communication (artisan and industrial) from their representative institutions to the institutions representing the administration, autonomous state, central state, or EU (the spaces in which the decisions are taken). This communication system should fulfill the purpose of informing, communicating, influencing, resolving, and negotiating the important decisions. Once the structure of governance is well identified, it is measured the goodness of that governance model. Good governance analysis should be seen as a necessary framework for analyzing the effectiveness of the involvement of stakeholders in the decision-making process. The objective is to find out whether the necessary governance principles are satisfied. In particular, the legitimacy, accountability, transparency, inclusiveness, fairness, engagement, connectivity and resilience.

This analysis has been developed based on a qualitative assessment in which semi-structured face-to-face interviews with Non-Governmental Organizations, NGO, and European level representatives were conducted to examine the SSF governance issues. In addition, focus groups were organized involving scientists, fishermen, and the partners of the traditional fisheries working group under the umbrella of the South West Waters Advisory Council (CCS). A review of relevant literature was also conducted.

Keywords: Small Scale Fisheries, Governance Analysis, Engagement, Decision-Making

Small versus large-scale fishing operations in Ireland: Understanding the socio-spatial dimension of small scale fisheries

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Estimates suggest that the small scale fisheries sector in the EU contributes to approximately 53% of the total employment in the catching sector. The sector is also of critical importance for the survival of coastal communities, with strong links with the local economy and the social structure of coastal areas. Despite its importance, studies on the characteristics and definition of sector in Ireland and elsewhere in the EU are limited, mainly due to poor data availability. This paper focuses on characterising, describing and comparing small scale fisheries and large scale fisheries sectors in Ireland. The two sectors are compared using socio-economic and environmental parameters including employment, landings, value and number of vessels. Furthermore the paper investigates the impact that local level employment has on the structure of the Irish fishing fleet along Ireland's coastal areas. Local employment opportunities play a major role in labour participation rates in the sector, as increasing unemployment at the local level contribute to an intensification of part-time fishing activities. The current research aims at understanding this trend further. The focus is on identifying spatial variations in the structure of the Irish fishing sectors as well as those geographic areas that are more vulnerable to changes in its fleet structure due to external factors such as local or regional changes in employment. Spatial data models are used to account for the potential spatial autocorrelation existing across contiguous coastal areas. The research contributes to improving our understanding of small scale fisheries in Ireland and the relationship between socio-economic indicators and the structure of the fishing fleets at the local and regional levels.

Keywords: small scale fisheries; large scale fisheries; employment; spatial analysis; socio-economic variables; environmental variables; fisheries policy

Small scale fisheries and participatory conservation measures in protected areas: can a more economic and social approach to the CFP reconcile biodiversity with provision and cultural ecosystem services?

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Small scale fisheries (SSF), due to their reduced range often face restrictions due to protected areas, which mostly occur in coastal waters. The social and economic effect of these restrictions are rarely analysed, though the key EU directive for protected areas, the Habitat directive (FFH) includes among its aims not only to maintain and restores habitats, but also "the consideration of economic social and cultural requirement and regional and local characteristics" (art. 2.3).

The SOCIOEC project analysed this approach in one case study for the gillnet fisheries in the Baltic island of Fehmarn, where the impact of a participatory scheme to balance biodiversity and SSF livelihoods was evaluated using economic and social methods.

The one-off analysis performed in this project opens the field to the analysis of other important aspects of the relationship between fishing activity and protected areas, as recreational fisheries and social data collection. Recreational fisheries are increasingly considered in fisheries (increased data collection, inclusion in assessments and under management tools) and protected areas (new participatory management schemes), while social data collection would bring new insights on key aspects of the economic and social impacts of protected areas on SSF, as the critical issue of fishers´succession. This constitutes a way forward from a project-based approach to the issue to a more programme-like approach, from economic and quantitative impact assessment to social capital approaches and qualitative methods.

Keywords: small scale fisheries, conservation measures, social sciences

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The annual economic report and the economic relevance of the SSCF in Europe

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Keywords: SSCF

SWOT Analysis of Marine Aquaculture in Turkey

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In this study, Swot Analysis of Marine Aquaculture in Turkey was investigated. Purpose of this study, how aquaculture enterprises, feed producers, processing enterprises, ministry employees, universities, retail businesses, research institutes and employees working for suppliers involved of sector to uncover the views of industry on SWOT analysis.

For this purpose, a questionnaire was applied to 61 people. Findings have been evaluated and interpreted separately and generally according to the types of businesses involved in the sector.

Keywords: Marine aquaculture, swot analysis

Economic Analysis of the use of Antibiotic and Vaccines in Trout Enterprises in Osmaniye Province (Türkiye)

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In this study, economical analysis of the use of vaccines and antibiotics in trout enterprises in Osmaniye province was investigated. The questionnaire form prepared for this purpose was applied to the responsible owners or engineers. The amounts and costs of vaccines and antibiotics were determined on an enterprise bases. The obtained data were transferred to the computer and the necessary statistics were analyzed. The economic analysis and the efficiency of vaccine and / or antibiotic use were calculated by determining the ratios of antibiotics and antibiotics used by enterprises in the fight against disease.

Keywords: Vaccination, economic analysis, trout enterprises

Incorporating Your Views into a Novel Fisheries Management System

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Real-time Incentives (RTI) management aims to offer a viable alternative to current management systems that can operate on fine spatial and temporal scales whilst incorporating ecosystem management, and simplifying implementation and compliance rules. In order to ensure its success, legitimacy, and eventual uptake, a comprehensive examination of the potential outcomes, successes, and indeed, possible failures must be undertaken. This process will be carried out in an extensive management strategy evaluation (MSE) which involves the development of scenarios with which to test the system, not just for comparison with current management strategies, but also to simulate the range of potential fisher behaviour, reactions and responses to a novel management approach.

Too often management approaches are top-down controlled and based primarily (or solely) on prescription and enforcement, leaving little room for innovation, positive reinforcement or empowerment. RTI aims to challenge this by building a framework that increases freedom of choice for fishers and invites them to propose ideas and innovations. In this way, RTI can harness the knowledge of those that know the resource best, to the mutual benefit of management, the ecosystem and the fishers themselves.

To achieve this the project partners are working alongside fishery stakeholders, co-developing methods and management scenarios, and trialling ideas, in a two-way process of development that aims to enable successful implementation through stakeholder engagement, participation and ultimate acceptance. The process is open and collaborative, and even in its infancy has already produced some innovative and unexpected results. The aim of this poster is to highlight this work, and to provide information and a contact point for getting involved. To continue this work we need your help.

Keywords: Real-time incentives, fisheries management, stakeholder engagement

Keywords: Vaccination, economic analysis, trout enterprises

Managing Northern Baltic salmon fisheries under social-ecological complexity

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The Atlantic salmon (Salmo salar) is a treasured catch for both commercial and recreational fishers at the Baltic Sea. Especially in Tornionjoki river, which is one of the two remaining wild salmon rivers in Finland, recreational fishing is an increasingly popular activity, and a source of plentiful debates among commercial fishers, resource conservationists, fisheries scientists and managers. The decreasing trend in commercial fishing highlights the importance of sound management in the river fisheries. Overlooking social-ecological complexities in the continuously growing recreational fishing may lead to unsustainable fisheries management. We develop a bioeconomic model looking at both the commercial and the recreational fishery. An age-structured matrix population model describes the life cycle of the salmon stock. We take into account the multiple motivations of recreational fishers and their implications for optimal management. In our model recreational fishing effort is endogenously changing. Over time, each angler changes the frequency of angling trips, dependent on how satisfying each trip is. Results from a contingent valuation study are used in formulating the recreational fishing utility functions. Furthermore, we specifically take into account that anglers are heterogeneous and are motivated by different factors, such as spending time in nature or catching fish for consumption. The key question we ask is how optimal management of the commercial fishery depends on the recreational fishery. We further ask whether any substantial welfare losses arise from ignoring social the complexity of recreational fishing. Finally we analyze whether it is important to consider the social complexity of the recreational fishery in management plans.

Keywords: Commercial coastal fishery, recreational river fishery, social complexity

Landing obligation: How much extra work do we have to do?

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The European Commission (EC) has recognized discards as one of the most important problems of the Community fishing fleet. The mandatory Landing Obligation (L.O.) of all regulated catches has been proposed to minimize discarding practices.

In the new framework are expected some operative and logistic problems on board and in land also. Some examples of these contingences are more work for the crewmembers, lack of storage capacity into the vessel or even in ports, operating costs related with the consume of goods and services: ice, boxes, fuel, transport, selling processes on the fish market, among others. This research focus specifically on measuring the extra work that the crews will need to handle all the catches that must to be landed.

Results show that the LO will require more time to be spent on processes carried out on board, demanding additional working hours that will necessarily involve readjusting the time assigned to other tasks and, in some cases, even making it materially impossible to carry out such tasks. Furthermore, more work can mean fewer rest hours for the crew. In those cases, the risk of accidents will rise and workplace safety will decrease. The investment of extra time will also take other forms on board, such as the accounting, recording and transmission of catches, processes which must be carried out with the utmost accuracy to avoid possible sanctions

This issue is particularly relevant in a fleet where fishermen's wages depends of "share payment"remuneration system. That implies that extra work won´t necessary means a higher salary for the fishermen and this could represent a negative incentive for crew's compliance with the new L.O.

Keywords: Landing obligation; Discards; CFP

Economic Impact of the Landing Obligation for the Galician (NW Spain) Trawlers Fleet

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The European Commission (EC) has recognized discards as one of the major challenges facing the Community fishing fleet. The obligation to land all regulated catches has been proposed as a mandatory and essential measure to minimize discarding practices. This paper analyzes the socioeconomic consequences of enforcement of the landing obligation on a Galician coastal trawler fleet. A representative number of in-depth interviews were carried out with ship owners and/or skippers of the fleet in question, in order to identify the envisaged operational and logistic problems on board and/or in port arising from the landing obligation. Furthermore, the current economic performance of the target fishing companies was analyzed using the Input-Output methodology in order to identify their most significant activity costs. The combination of both research techniques enabled the potential consequences of the new landing obligation to be evaluated, with the conclusion that it will generate additional costs in different phases of the fishing process that may negatively affect the economic performance of fishing companies. Particularly, he research undertaken for this study has identified the three main areas in which these costs manifest themselves: on board ship, on shore and in terms of loss of quota. Ultimately, some recommendations to improve the implementation of the new rule will be made.

Keywords: Landing Obligation; Discards, Economic impact

Fishery Local Action Groups: strategy analysis and small scale fishery opportunities in Croatia

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Community-led local development (CLLD) is a method for involving partners at local level including the civil society and local economic actors in designing and implementing local integrated strategies that help their areas make a transition to a more sustainable future. It is led by a local action group composed of representatives of public and private local socio-economic interest.

Concluding with 2016, 12 Fishery Local Action Groups (FLAG) in Croatia and 21 maritime oriented Local Action Group are established, and according to different geographical characteristics they have developed strategies for local fisheries development.

The first step in creating strategy involved determination of socio-economic development level within the FLAG covered area. The paper presents current state of selected demographic, economic and technical indicators within the FLAG covered areas and classify them in groups based on the level of socio-economic development.

Considering the expected socio-economic effects of FLAG activity, classification will be used as a basis for further evaluation of local action groups work results, taking into account the implemented projects and their effects on the socio-economic indicators.

Since the small scale fishery (considering vessels <12m length) accounts for 92% of Croatian fleet, and is also a significant part of Croatian fisheries in matter of fishing community tradition, identity and local development, the paper gives the analysis of small scale fishery within the FLAG covered areas and explores opportunities and possibilities for the sustainability of small scale fishery and diversification of activities in fisheries provided in development strategies.

Moreover, the paper provides an overview of best practices with a significant effect on the empowerment of local communities from past actions of maritime oriented Local Action Groups.

Keywords: Fisheries Local Action Groups, sustainable development, small scale fisheries

The PrimeFish project, developing innovative toolbox to strengthen the sustainability and competitiveness of European seafood

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The overall aim of PrimeFish project is to improve the economic sustainability of European fisheries and aquaculture sectors. PrimeFish will gather data from individual production companies, industry and sales organisations, consumers and public sources. The data will be related to the competitiveness and economic performance of companies in the sector; this includes data on price development, supply chain relations, markets, consumer behavior and successful product innovation. A large industry reference group will facilitate access to data on specific case studies. A data repository will be created, and PrimeFish will join the H2020 Open Research Data Pilot to ensure future open access to the data. The effectiveness of demand stimulation through health, label and certification claims will be evaluated and compared with actual consumer behavior. PrimeFish will assess the non-market value associated with aquaculture and captured fisheries as well as the effectiveness of regulatory systems and thereby provide the basis for improved societal decision making in the future. The collected data will be used to verify models and develop prediction algorithms that will be implemented into a computerized decision support system (PrimeDSS). The PrimeDSS, together with the underlying data, models, algorithms, assumptions and accompanying user instructions will form the PrimeFish Decision Support Framework (PrimeDSF). The lead users, typically fishermen, aquaculture producers and production companies, will be able to use the PrimeDSF to improve understanding of the functioning of their markets and in setting strategic plans for future production and innovation which in turn will strengthen the long term viability of the European fisheries and aquaculture sectors. This will also benefit consumers, leading to more diversified European seafood products, enhanced added value, novel products and improved information on origin, certification and health claims.

The PrimeFish project has received funding from the European Union's Horizon 2020 Research and Innovation Programme (H2020/2014-2020) under grant agreement n° 635761.

Keywords: Fisheries, Aquaculture, Prediction tool, Competiveness, Economic performance, Innovation, Seafood market

Bioeconomic assessment of an increase in mesh size in an Irish Nephrops fishery

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With an estimated value of €49m at first point of sale in 2015, Nephrops norvegicus is Ireland's most commercially important demersal fishery. The Western Irish Sea is an important fishing ground with annual landings of ~ 2500 t corresponding to 100% quota uptake by Irish vessels in that area, but with a discard rate of ~ 17 % of Nephrops. Since the start of 2016, discarding of Nephrops has been restricted under the EU Landing Obligation, providing impetus for improved Nephrops selectivity. Following constructive discussion on this issue with Industry and other State bodies, BIM conducted a simple bioeconomic assessment of an increase in minimum codend mesh size from 70 to 80 mm as a potential measure to improve Nephrops selectivity. In the context of the Landing Obligation and 100% quota uptake, vessel profitability projections were constructed using the following inputs: Nephrops catch data from a fishing gear trial of different codend mesh sizes in the Western Irish Sea; a series of simulated Nephrops length distributions to take account of temporal or spatial variability in catches; price data for specific size grades of Nephrops; and detailed operational cost information from the trial vessel. Results demonstrated how reduced catches of small Nephrops afforded an extra opportunity to catch increased quantities of larger more valuable Nephrops, resulting in an increase in profitability in the 80 mm compared with the 70 mm codend. Based on the results of this study and public consultation, a new regulation was introduced on the 1st January 2017 which requires an increase in minimum codend mesh size from 70 to 80 mm in the Irish Nephrops fishery. This will boost fishery sustainability and profitability, and greatly assist Irish vessels in meeting landing obligation requirements.

Keywords: landing obligation, codend mesh size, increased profitability

Separating species to increase sustainability and economic returns in a mixed demersal fishery using a dual codend separator trawl

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Mixed-species demersal trawling is one of the largest sectors in Ireland's polyvalent fishing fleet. Since January 2016 these vessels are required to be more selective and reduce discarding, under the EU landing obligation, whereby all catches (of specified species) need to be landed. Under the landing obligation there are concerns that the quota for some species (primarily whitefish species) will quickly be filled, reducing many fishers ability to continue fishing. Many current gear configurations are being improved in order to comply with the new legislation. One such adaptation is the dual codend. The dual codend has a separator section which facilitates the separation of key species (Nephrops norvegicus and mixed whitefish) into two separate codends. Research to date has shown that >85% of Nephrops were retained in the lower codend, while > 80% of key whitefish species were retained in the upper codend. This separation means that if the quota has been exhausted for one or several whitefish species the top codend can be modified—with large mesh, left open or removed—to facilitate escapement. The ability to separate whitefish and target Nephrops provides fishers with the ability to continue fishing. The findings contribute to the ongoing development of a viable fishery and will assist fishers with choosing a practical gear option under the landing obligation. Additionally, if quota exists the dual codend also has the potential to increase the catch value. By separating the whitefish from Nephrops there is the potential for overall catch quality to improve, increasing further the fisheries economic viability.

Keywords: landing obligation, species separation, economic viability

T90 mesh improves selectivity and addresses the landing obligation for Celtic Sea whiting

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The 2017 Irish Whiting quota in the Celtic Sea (ICES VIIb-k) is 7,651 tonnes with an estimated value of approximately €10.4 million at first point of sale. Minimum mesh size in the fishery is 80mm but discard rates of >30% have been recorded. Phased in under the landing obligation in 2016, a 7% de minimis exemption is in place for Celtic Sea whiting. The high level of unwanted catch has potential to increase costs, reduce opportunity and adversely affect economic viability. Size selectivity in the targeted whiting fishery could be improved through an increase in diamond mesh size but is likely to result in a decrease of both marketable and unwanted catches. Therefore a means to improve the size selectivity of the current (80mm) minimum mesh size was required. The size selectivity of diamond mesh is largely determined by the openness of the mesh and two relatively simple ways to improve mesh opening are to turn the mesh 90° (T90) and reduce the number of meshes in circumference. The cost of modifying the whole trawl was considered prohibitive in the short term so the rearmost un-tapered section of the trawl was modified, i.e. the extension piece and codend. Comparative trials of 80mm diamond and T90 mesh resulted in a 67% reduction of undersized catches and a 16% increase of market-sized whiting. An additional benefit of the T90 gear was the improved quality of the catch which has potential to increase the economic value of the fishery.

Keywords: mesh orientation, improved size selectivity, enhanced quality

High survivability, an important driver for improved sustainability and economic returns in the Irish Nephrops fishery

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With a value of €49 million in 2015 at first point of sale, Nephrops norvegicus is Ireland's most commercially important demersal species. The Irish Nephrops fishery faces major challenges to reduce unwanted catches and meet new restrictions on discarding under the landing obligation (LO). Prior to the introduction of the LO, Nephrops discard rates ranged from 5 to 28%, depending on the location of the fishery. Under the LO undersize Nephrops will be deducted from quota with major economic implications for Irish vessels unless appropriate measures can be developed. Gear modifications can partially assist but are not currently capable of excluding undersize Nephrops without negatively affecting market sized catches. Article 15.4(b) of Regulation (EU) No. 1380/2013, provides an exemption under the LO for species which scientific evidence demonstrates high survival rates. Recent work in the UK demonstrated high Nephrops survivability with a netgrid device which substantially reduced catches of fish species in Nephrops trawls. This has resulted in the application of a high survivability exemption for Nephrops catches in the North Sea for bottom trawls equipped with a netgrid. BIM and the Irish fishing industry have developed a number of gear modifications which substantially reduce fish catches and hence, scope exists for a similar exemption to be applied in the Irish Nephrops fishery. In consultation with the Irish fishing industry, BIM plan to conduct a Nephrops survivability study using an appropriate highly selective gear type. We aim to use internationally accepted sampling protocols and liaise with other member states to optimise Nephrops survivability, biological sustainability and economic returns from the fishery.

Keywords: landing obligation, exemption, highly selective gear

Economic Evolution of Marine Capture Fisheries in Turkey

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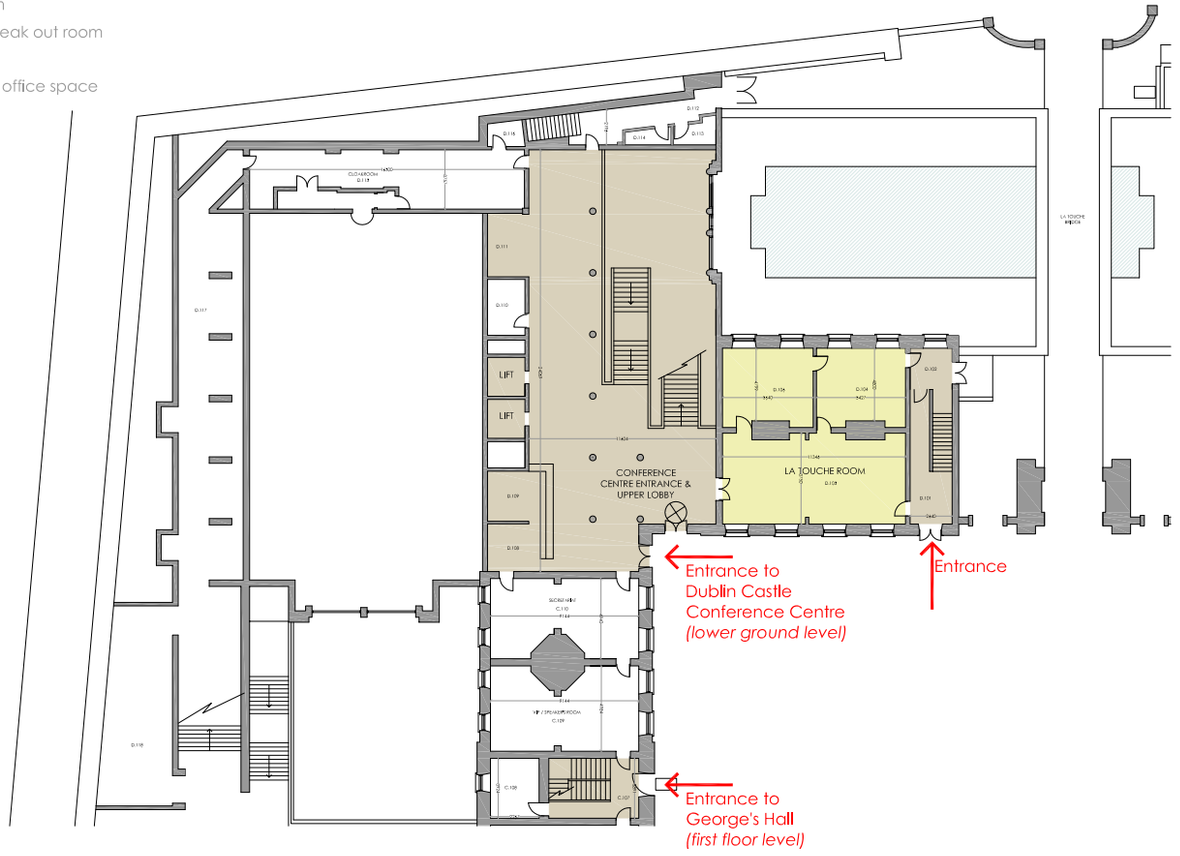
Marine capture fisheries in Turkey has great importance in creating employment, principally, for the coastal communities, by contributing the exportation, by providing raw material for the related industry. It has mainly vital role within the country's total seafood production although it has not great economic magnitude (0.3%) in the country's gross domestic product. With this study, we mainly investigate the positive and negative returns from Turkish marine capture fisheries. 15 years of time series covering catch amounts per species with their market prices and all types of fixed and variable fishing expenses were used from Turkish Statistical Institute is used. The flow of revenues through the time period will be investigated. General output of the research is to highlight the profitability of the Turkish marine capture fisheries. Furthermore, it is aimed to put forward the gaps regarding the quantity and the economic value of illegal, unregulated and unreported catch within the total capture.

Keywords: Marine capture fisheries, economics, Turkey

LEGEND
- main plenary room
- function room / break out room
- circulation space
- delegation area / office space
- cloakroom areas
- WC



CONFERENCE CENTRE - GROUND FLOOR LEVEL

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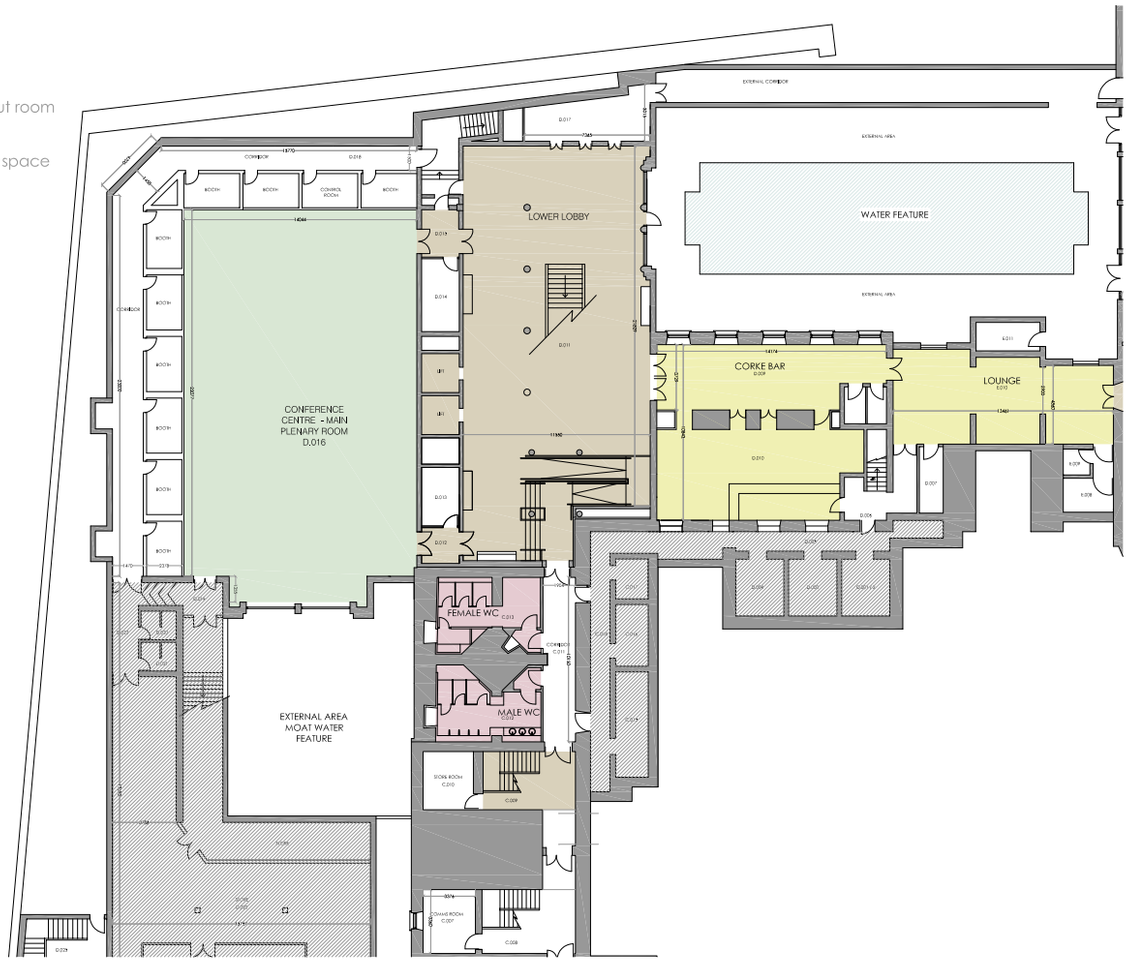
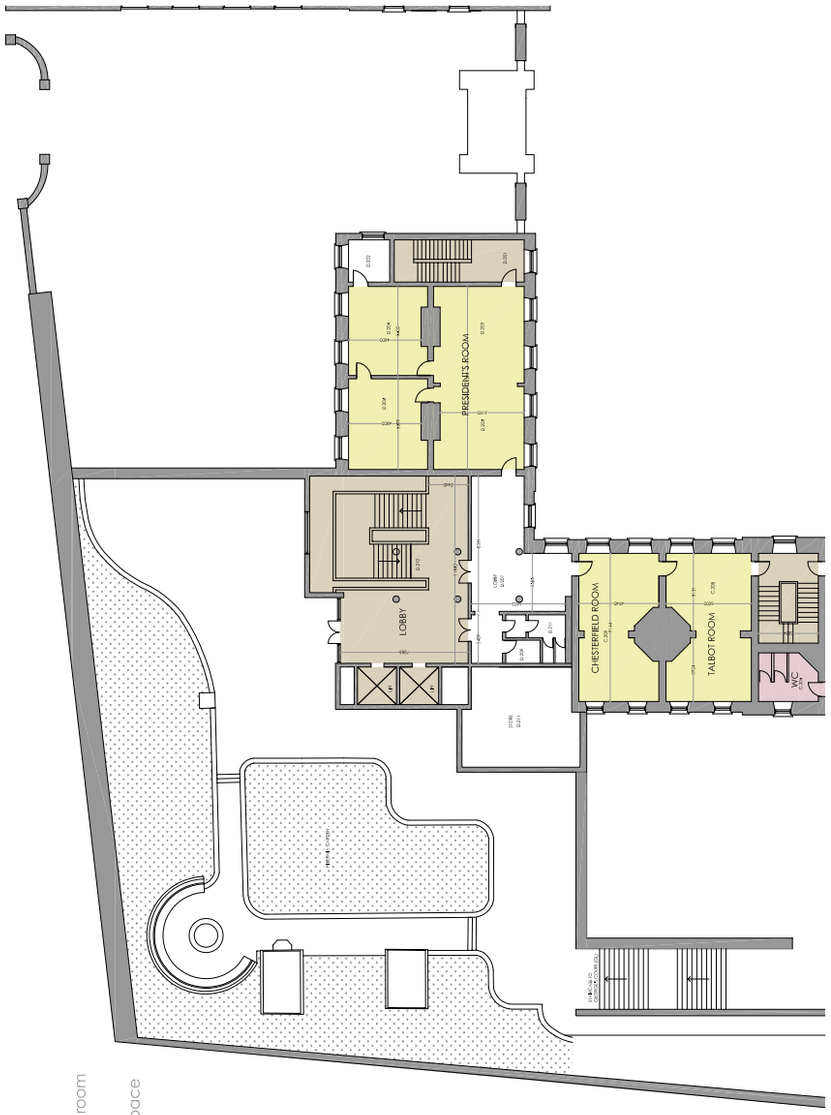


CONFERENCE CENTRE - LOWER GROUND FLOOR LEVEL

CONFERENCE CENTRE - FIRST FLOOR LEVEL



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Notes

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