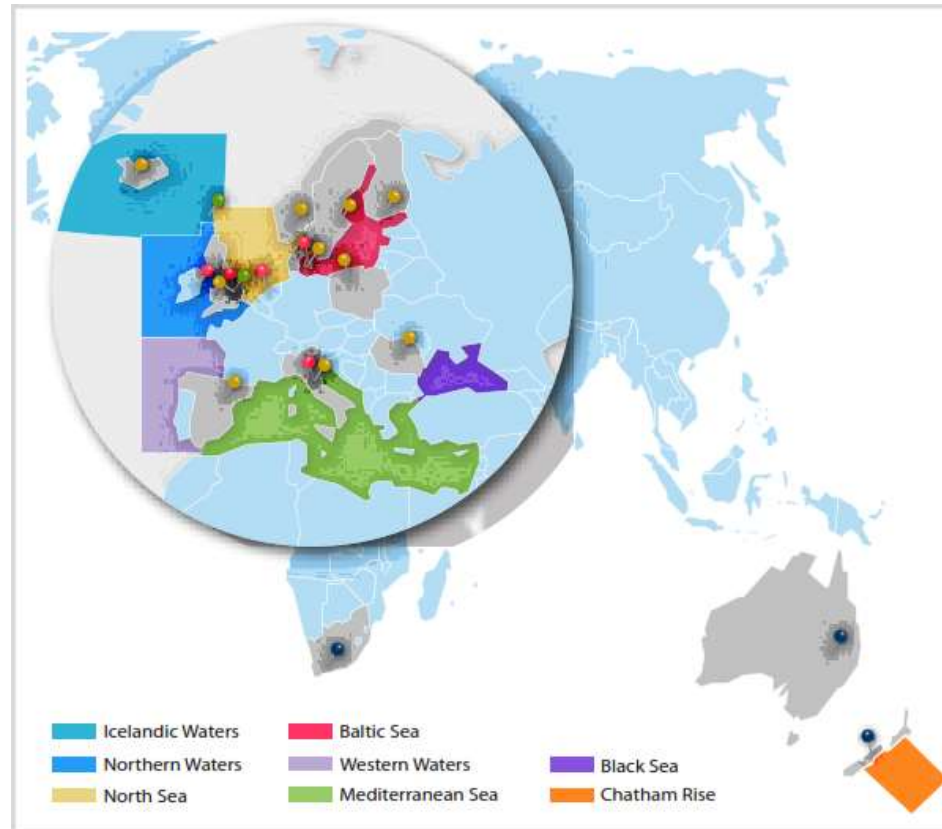


# **CO-CREATING ECOSYSTEM BASED FISHERIES MANAGEMENT SOLUTIONS**



**Coordinator:** Anna Kristín Daniélsdóttir - MATIS

**Scientific Manager:** Gunnar Stefánsson - UI

**Administrative Manager:** Oddur Már Gunnarsson - MATIS



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 613571



**MareFrame**

**In memory of  
Kristinn Ólafsson  
Matís Ltd**

## **From Hávamál**

Deyr fé,  
deyja frændr,  
deyr sjálfr et sama;  
ek veit einn,  
at aldri deyr:  
dómr um dauðan hvern.

Cattle die,  
kinsmen die  
you yourself die;  
I know one thing  
which never dies:  
the judgment of a dead man's life.



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**MareFrame**



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## Annual Meeting, Palermo 2016





...the statistics and economic data support Climate Lobbying





## External Advisory Group (EAG) 2017

Participant and organisation name	Short name	Country
<b>Andre Punt</b> Marine Population & Management Group, School of Aquatic & Fishery Sciences, University of Washington	<b>UW</b>	<b>USA</b>
<b>Andrew I.L. Payne</b> International Fisheries Consultant, A&B Word Ltd	<b>A&amp;B Word</b>	<b>UK</b>
<b>Grímur Valdimarsson</b> Former Senior Advisor at the Department of Resource Management, Ministry of Fisheries in Iceland	<b>ANR</b>	<b>IS</b>
<b>Lucia Fanning</b> Dalhousie University, Nova Scotia	<b>DAL</b>	<b>CA</b>
<b>Robin Cook</b> MASTS Marine Population Modelling Group, University of Strathclyde	<b>UStrath</b>	<b>UK</b>
<b>Villy Christensen</b> Fisheries Centre, University of British Columbia	<b>UBC</b>	<b>CA</b>





## Belém Statement 2017

Atlantic Research and Innovation Cooperation



**Belém Statement on  
Atlantic Research and Innovation Cooperation**  
Conference in Lisbon on 13-14 July 2017

Oceans play a key role in developing national and regional economies, achieving the Sustainable Development Goals, and addressing climate change. The ongoing activities related to the Atlantic Ocean Research Alliance and deepening scientific cooperation in the South and Tropical Atlantic, and Southern Ocean are widely recognised.

# A NEW ERA OF BLUE ENLIGHTENMENT

LAUNCHING THE EUROPEAN UNION – BRAZIL – SOUTH AFRICA  
ATLANTIC OCEAN RESEARCH AND INNOVATION COOPERATION



Open Innovation, Open Science  
and Open to the World



**MareFrame**

## Conferences 2017

**The XXIIIrd Conference of the European Association of Fisheries Economists (EAFE) conference, 25-27 April 2017, Dublin, Ireland**

<http://www.bim.ie/eafe/>

**World Seafood Conference, 10-13 Sept 2017, Reykjavik, Iceland**

<http://www.wsc2017.com/programme>

**ICES Annual Science Conference, 18–21 Sept 2017, Fort Lauderdale, Florida, USA**

<http://www.ices.dk/news-and-events/asc/ASC2017>



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# Societal challenges and co-creation



# Co-creation is OK

MareFrame





ALL TOGETHER towards sustainable management, better use and economic sustainability of marine resources.....BLUE BIOECONOMY – BLUE GROWTH



SAF|21

MareFrame





**EcoFishMan** (MATIS, UI, UNIABDN, CETMAR,  
UiT, SYN, MAPIX)

**STAGES** (CETMAR, ICES)

**ECOKNOWS** (UH, SLU, IEO, CSIC)

**MyFish** (IFM-AAU, NMFRI, IEO)

**VECTORS** (IFM-AAU)

**GAP2** (UiT)

**BENTHIS** (SYN, CNR, SLU)

**ODEMM** (IFM-AAU, NMFRI)

**SOCIOEC** (UI, IFM-AAU)

**DeepFishman** (UI, MRI)

**FAROS** (CETMAR, CSIC)

**DiscardLess**

**MINOUW**

**FarFish**

# MareFrame



**KnowSeas** (SU, CSIC)

**ACCESS** (Nofima)

**MEFEPO** (UiT)

**MADE** (Nofima)

**JAKFISH** (UiT, IFM-AAU, IEO)

**TXOTX** (UCT)

**COEXIST** (CNR)

**CREAM** (CSIC, CNR)

**EUR-OCEANS** (CNR, UCT)

**PERSEUS** (CSIC, IEO)

**WISER** (CSIC, CNR)

**BONUS INSPIRE** (NMFRI)

**PrimeFish**

**SAF21**

**ClimeFish**

MareFrame liaises with other national and international research projects and is of high relevance to the future management of living marine resources in Europe in a changing environment, taking a holistic view incorporating socio-economic and legislative issues

## MAIN OUTCOMES

### **New tools and technologies:**

- indicators, MareFrame database incl. upload & extraction routines, evaluation tools

### **Extended ecosystem models and assessment methods:**

- tests and comparisons of models across ecosystems

### **New Decision Support Framework (DSF) that can highlight alternative management actions and their consequences**

### **Development, acceptance and incorporation by stakeholders:**

- co-creation, training tools, visualization tools for different management scenarios

### **Support implementation of the new Common Fisheries Policy (CFP), the Marine strategy Framework Directive (MSFD) and the Habitats Directive (HD). Also the SA strategy on “Operation Phakisa Oceans Economy”**

- develop clear policy objectives, effective decision-making, industry that is ecologically, socially and economically sustainable.





## CO-CREATION= IMPACTFUL SCIENCE

### MareFrame on-going inputs for ICES



#### SINGLE SPECIES

- WGBE Working Group on Bay of Biscay and Iberian Waters Ecoregion
- WGDEEP Working group on biology and assessment of deep-sea fisheries resources
- WGHANSA Working Group on Southern Herring, Mackerel, Anchovy and Sardine
- WGMIXFISH Working Group on Mixed Fisheries Advice

West of Scotland biomass-based indicators and Trophic level based indicators

Baltic Pressure descriptor

North Sea Pressure descriptor

South Western Waters Cetaceans in WGME

South Western Waters Pressure descriptor Anchovy

#### GES DESCRIPTORS



Gadget Working document: "A GADGET Multi-species models for octacean and lake interactions in the Iberian Peninsula"

Atlantis, EwE Icelandic continental shelf area Multi-species presentation

EwE West of Scotland Multi-species key run

EwE Baltic Sea Multi-species key run

ToR d Investigate the performance of multi-model ensemble in comparison to single model approach for the Baltic Sea

Green Model Presentation: "Green Model for the North Sea"

#### INTEGRATED ADVICE



WIDEICE Working Group on DEveloping Integrated Advice for Baltic Sea ecosystem-based fisheries management

WGME Working Group on Marine Mammal Ecology

### MareFrame alternatives for ICES



TRAINING COURSES  
(e.g. Gadget)



AD HOC WORKSHOPS 2017  
(e.g. from WGs findings)



JOINT SESSIONS  
ICES-STEFCF 2018  
Decision Support  
Tools for the EAFM



ASC 2017 ICES  
ECOSYSTEM APPROACH  
Meeting Point

Criteria/Management Alternatives	Business as Usual	Multispecies Max. Economic Yield	Max Conservation	
ICPP COMPLIANCE	Stocks within fishing mortality threshold			
	Stocks with spawning stocks biomass > MSY			
ECOSYSTEM ASPECTS	Within spawning stock biomass risk limits			
	Bottom disturbance			
	Charismatic species bycatch			
ECONOMIC ASPECTS	Pelagic profit			
	Demersal profit			
SOCIAL ASPECTS	Fleet labour			
	Processing labour			
	Non-viable fleets			



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# ICES RoadMap, cont.



## Advice: Single Species

WG	Name	Species	When	What
WGBIE	Working Group on Bay of Biscay and Iberian Waters Ecoregion	Hake	3-10 May 2017	Working document: "Hake natural mortality estimation from GADGET multispecies model"
WGDEEP	Working group on biology and assessment of deep-sea fisheries resources	Tusk & Ling	24 April-01 May 2017	Single Species Management Plans for Tusk and Ling in Icelandic Waters
WGHANSA	Working Group on Southern Horse Mackerel, Anchovy and Sardine	Anchovy	24-26 June 2017	Presentation: "Modelling anchovy dynamics in the Gulf of Cádiz: environmental forcing and economic projections"
WGMIXFISH	Working Group on Mixed Fisheries Advice	Demersal & Pelagic	22-26 May 2017	Presentation: "Green model for the North Sea"



## Advice: GES Descriptors

Sea basin/area	Descriptor/Indicator	Descriptor
West of Scotland	Biomass-based indicators and Trophic level based indicators	1,3,4
Baltic	Pressure descriptor	3.1
North Sea	Pressure descriptor	3.1
South Western Waters	Cetaceans in WGMME	1,3,4
South Western Waters	Pressure descriptor Anchovy	3



## Science: Model Advances WGSAM Working Group on Multispecies Assessment Methods

Model	Date	What
Gadget	TBC 16-20 Oct 2017	Working document: "A GADGET multispecies models for cetacean and hake interactions in the Iberian Peninsula"
Atlantis, Ewe	TBC 16-20 Oct 2017	Icelandic continental shelf-area multi-species key run
EwE	TBC 16-20 Oct 2017	West of Scotland Multi-species key run
EwE	TBC 16-20 Oct 2017	Baltic Sea Multi-species key run (update from the one submitted in 2016, available here*)
ToR d	TBC 16-20 Oct 2017	Investigate the performance of multi-model ensemble in comparison to single model approach for the Baltic Sea
Green Model	TBC 16-20 Oct 2017	Presentation: "Green Model for the North Sea"

\*<http://www.ices.dk/community/groups/Pages/WGSAM.aspx>



## Science: Integrated Advice

<b>WDEICE</b>	Working Group on DEveloping Integrated ADvice for Baltic Sea ecosystem-based fisheries management	Presentation of the MareFrame Decision Support Tool
<b>WGMME</b>	Working Group on Marine Mammal Ecology	Co-chair (B. Santos). Progress in analysis of model inputs (natural mortality, survey time series, diet, etc), cetacean model development, identification of GES indicators, etc have been presented, mainly through contribution to Reports



This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no. 6113571



## CO-CREATION= IMPACTFUL SCIENCE



### GFCM RoadMap

**SINGLE SPECIES**

**GES DESCRIPTORS**

**MODEL ADVANCES**

**INTEGRATED ADVICE**

**C&C**  
Working group on EU fishing (WG&U)

**WGES**  
Sixth meeting of the Working Group on the Black Sea (WG&S)

**WGS&D**  
Working Group Stock Assessment (Demersal Species) (2017)

**SAC**  
SubCommittee Central Mediterranean (2017-2018)

**Gadget**  
Presentation of Gadget modelling results for IS and Med during planned GFCM events

**Atlantis**  
Presentation of Atlantis modelling results for Med during planned GFCM events

**D&E**  
Presentation of D&E modelling results for IS and Med during planned GFCM events

**NW Black Sea**  
Biomass-based Indicators and Trophic-level based Indicators

**Mediterranean (Strait of Sicily)**  
Biomass-based Indicators and Trophic-level based Indicators

**WGES**  
Sixth meeting of the Working Group on the Black Sea (WG&S)

**WGS&D & SUBCOMMITTEE SAC**  
Working Groups in stock assessment for demersal species & Sub-Com on Central Mediterranean

Criteria/Management Alternatives

Business as Usual

Multispecies Max. Economic Yield

Max Conservation

COMPLIANCE

ECOSYSTEM ASPECTS

ECONOMIC ASPECTS

SOCIAL ASPECTS

Stocks within fishing mortality threshold



Stocks with spawning stocks biomass > MSY



Stocks with spawning stocks biomass > MSY



Within spawning stock biomass risk limits



Bottom disturbance



Charismatic species bycatch



Pelagic profit



Demersal profit



Fleet labour



Processing labour



Non-viable fleets



### Options - Strategic Actions



AD HOC WORKSHOPS 2017



JOINT SESSIONS GFCM-STECEF 2018



TWINNING WITH BLACK SEA4FISH PROJECT



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# GFCM RoadMap, cont.



## Advice: Single Species

WG	Name	Species	Where & When	What
CoC	Working group on IUU fishing (WGIU)		Greece 2-5 May 2017	Presentation of the MareFrame Decision Support Tool/Strait of Sicily Case Study Presentations of modeling results (Gadget/EwI/Atlantis)
WG20	Working group on VMS and related control systems / working group on integrated MCS measures for demersal fisheries in the Strait of Sicily			
WG20	Sixth meeting of the Working Group on the Black Sea (WG20), including workshop on impacts of management measures on selected fisheries	Turkey Plovid dohrin Sofia Anchovy Whiting	Constanta, Romania 13-16 June 2017	Presentation of the MareFrame Decision Support Tool/TS Case Study Presentations of modeling results (Gadget/EwI)
WG20	Working Group Stock Assessment Demersal Species (2017)	Hake, Deep-Water rose shrimp	TSD	Presentation of single species multi-species Gadget models: hake and deep-water rose shrimp
SAC	Sub-Committee Central Mediterranean (2017-2018)	Hake Deep-Water rose shrimp	TSD	Presentation of the MareFrame Decision Support Tool/Strait of Sicily Case Study Presentations of modeling results (Gadget/EwI/Atlantis)

CoC – Compliance Committee  
WG20 – Working Group for the Black Sea

SAC – Scientific Advisory Committee on Fisheries  
WG20 – Working Group Stock Assessment Demersal Species



## ADVICE: GES DESCRIPTORS

Sea Basins/Venues	Description/Indicator	Descriptor
NW Black Sea	Biomass-based indicators and Trophic level based indicators	1,3,4
Mediterranean (Strait of Sicily)	Biomass-based indicators and Trophic level based indicators	1,3,4



## Model Advances

Model	Date	What
Gadget	2017	Presentation of Gadget modeling results for BS and Med during planned GFCM events
Atlantis	2017	Presentation of Atlantis modeling results for Med during planned GFCM events
EwI	2017	Presentation of EwI modeling results for BS and Med during planned GFCM events



## SCIENCE: INTEGRATED ADVICE

<b>WG20</b>	Sixth meeting of the Working Group on the Black Sea (WG20), including workshop on impacts of management measures on selected fisheries	Presentation of the MareFrame Decision Support Tool/TS Case Study Constanta, Romania 13-16 June 2017
<b>WG20&amp; SUBCOMMITTEE SAC</b>	Working Groups on stock assessment for demersal species and Sub-Com on Central Mediterranean	Presentation of the MareFrame Decision Support Tool/Strait of Sicily Case Study Presentations of modeling results (Gadget/EwI/Atlantis)



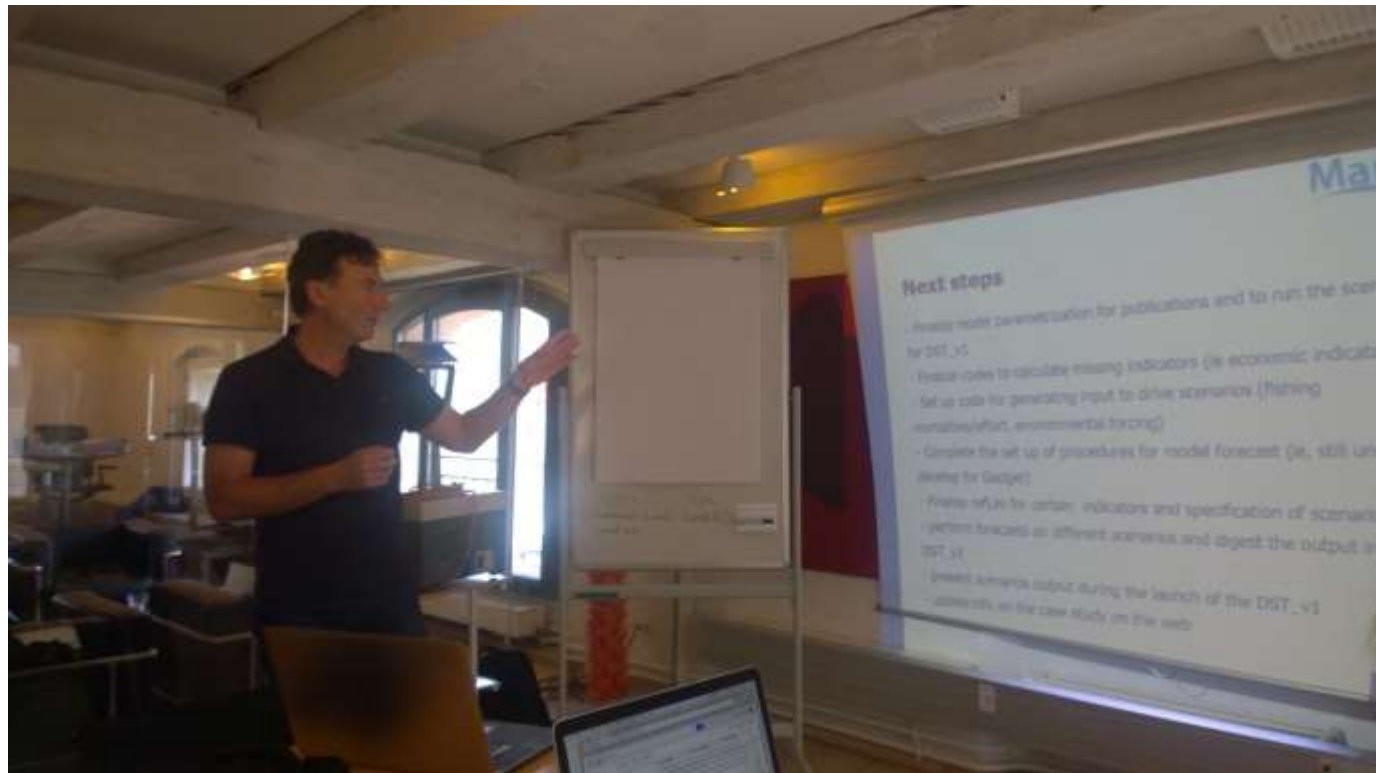
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## The Sustainable Development Goals (SDGs) by 2030 (United Nations)



## NEXT STEPS



### Next steps

- Finish model parametrization for publications and to run the scenarios for DGT\_v1
- Finish codes to calculate missing indicators (ie economic indicators)
- Set up code for generating input to drive scenarios (fishing, mortality/effort, environmental forcing)
- Complete the set up of procedures for model forecast (ie, still under testing for Gadget)
- Finish efforts to obtain indicators and specification of scenarios
- Perform forecasts on different scenarios and adjust the output to DGT\_v1
- Present scenarios output during the launch of the DGT\_v1
- Publish results on the case study on the web



# **H2020 Excellent Science Marie Skłodowska-Curie actions**

**Research and Innovation Staff Exchange  
H2020-MSCA-RISE**

**Deadlines:**

**21 March 2018**

**Innovative Training Network  
H2020-MSCA-ITN**

**15 Jan 2019**

**Individual Fellowships  
H2020-MSCA-IF**

**12 Sept 2018**







# Acknowledgements

## EAG members and Stakeholders

# MareFrame

[www.mareframe-fp7.org/](http://www.mareframe-fp7.org/)

Funded under the EU FP7 Programme  
A consortium of 28 partners from 14 countries  
Duration of four years: Jan. 2014 – Dec. 2017

Work Programme topic addressed: KBBE  
2013.1.2-08: Innovative insights and tools to integrate  
the ecosystem-based approach into fisheries advice



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## Þeir fiska sem róa







## Developing Innovative Market Orientated Prediction Toolbox to Strengthen the Economic Sustainability and Competitiveness of European Seafood on Local and Global markets.

### The challenges

Two thirds of seafood consumed in EU is imported. Although capture fisheries in Europe have declined, the aquaculture sector has not grown to meet the increased demand for seafood. These and others challenges affecting the economic sustainability of European seafood producers are addressed in PrimeFish, a four year Horizon 2020 funded research project.

To improve economic sustainability and competitiveness, information will be gathered and analysed for new knowledge and insights into the performance of fisheries and aquaculture sectors on local, European and international markets.

To facilitate data access for the specific case studies and to create added value, PrimeFish has a large Industry Reference Group (IRG) within Europe, Canada and Vietnam.

### Project results

The outcome of the project will be models that can be used to compare competitiveness and to predict possible "boom and bust" price cycles, for strategic positioning within the value chain, on success analysis for new products and for innovation and price analysis for specific species.

The implementation of the simulation and prediction models into a web-based market intelligence toolbox for seafood operators and policymakers is one of the key concepts of the project. The toolbox will provide peer comparison to both fishermen, aquaculture producers and processing companies and to public stakeholders on a country or species level.

By improving strategic decision making for industry players and policymakers the long term economic sustainability of EU fisheries and aquaculture sectors will be enhanced.

### Creating shared value

The knowledge generated by PrimeFish will be implemented through a constant interaction with the IRG that will test and validate the project outcomes. The IRG will remain open through the project's life, and seafood stakeholders willing to participate are welcome to contact us at [irg@primefish.eu](mailto:irg@primefish.eu)

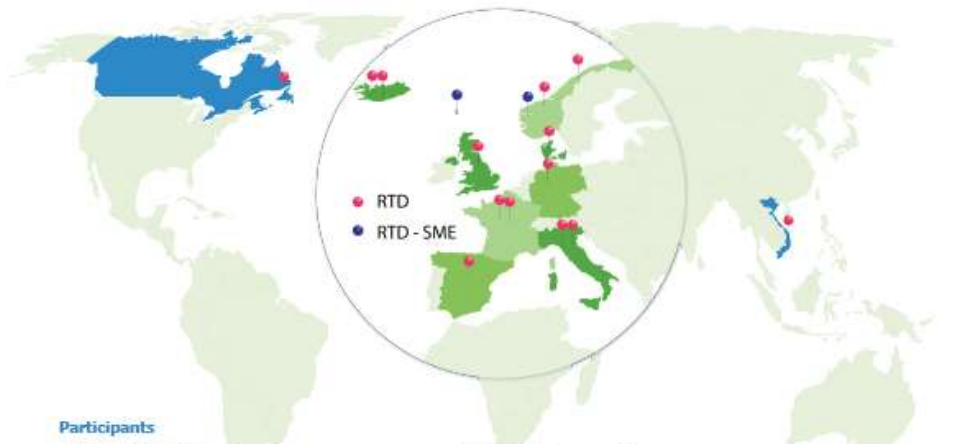
#### Would you like to know more?

##### Follow us:

[www.primefish.eu](http://www.primefish.eu) [@Prime\\_Fish](https://twitter.com/Prime_Fish) [@Prime\\_Fish](https://www.linkedin.com/company/primefish) [PrimeFish](https://www.facebook.com/PrimeFish)

##### Project Coordinator:

Gudmundur Stefánsson, Matis, Iceland [gst@matiss.is](mailto:gst@matiss.is)



### Participants

1. Matis Ltd (coordinator)
2. University of Aalborg
3. Syntesa
4. French National Institute for Agricultural Research
5. Université de Savoie
6. Technologie-Transfer Zentrum Bremerhaven
7. University of Iceland
8. University of Parma
9. University of Pavia
10. Kotali Analyse
11. Norwegian Institute of Food, Fisheries and Aquaculture Research
12. University of Tromsø
13. Centro Tecnológico del Mar
14. University of Stirling
15. Nha Trang University
16. Memorial University