What is happening in CERES?

Coordinator´s corner

Where do we stand?

CERES held it´s annual meeting in Galway, Ireland - looking back on a very successful year. Future projections of physical impacts of climate change for European marine and freshwaters are well on track and will be ready soon. These physical projections align with different political and economic futures outlined in our CERES scenarios.

CERES major storylines – case studies following species from physics, via biology and exploitation up to risk assessment and management - are updated. These storylines provide a clear route, so that industry and policy stakeholders can help co-define and identify key issues. CERES partners are poised to conduct and have already had meaningful meetings with regional stakeholders. This approach will provide bottom-up (via industry) and top-down (policy) solutions to short-, medium- and long-term consequences of climate change.

Besides meetings with regional stakeholders, next steps of CERES include the nuts and bolts of linking modeling outputs and incorporating them into climate vulnerability and opportunity assessments for the fisheries and aquaculture industries. CERES is well on track with its ambition.

Regardless of your role in aquaculture and fisheries - as industry leader, manager or policy maker, scientist or merely an interested member of the public - I encourage you to visit our website. Here, we have provided you various ways to learn about our project and, more importantly, to provide your valuable input.

Get involved into CERES - get deeper insights

Contact us!

Highlight

CERES goes Irish

70 science and industry partners met - together with the members of the research advisory board and the reference user group - at the National University of Ireland, Galway (25-27th of March) for the very successful annual CERES consortium meeting. Three productive meeting days were filled with progress reports, scientific talks, hands-on workshops and strategy development. Highlights included the presentation of "CERES storylines", sector- and region-specific activities which bring together CERES physical, ecological and economic science and series of presentations by industry partners and members of our research advisory board on stakeholder engagement.

Featured article

Turkish industry gets involved into CERES

A joint workshop organized by Mersin University (MEU) and Elazığ Fisheries Research Institute was held on 4th May in Elazığ Province, the largest rainbow trout producing region in Turkey. The workshop gathered stakeholders including **trout farmers, researchers and relevant public administrators.** ... read more

CERES in action

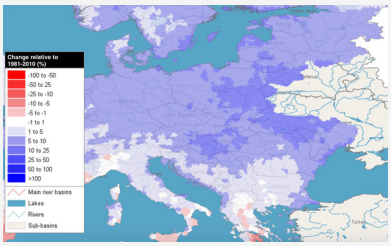
Groundfish forum - Coordinator Myron Peck (Hamburg University) talked with leading members of the **global groundfish industry** about „Forcasting and anticipating effects of climate change on groundfish and their fisheries".

CERES was invited as show case to the **Blue Economy Business and Science Forum**, a platform launched by the European Commission for business, science and policy to discuss opportunities for innovation in the blue economy sector.

A field campaign with **Irish salmon and mussel farmers** provided news insights into the impact and perception of climate change induced effects. This data forms a basis for future risk and vulnerability assessments.

First results from **field and laboratory experiments** on the effect of temperature on mussel physiology showed strong differences between species and locations. You can even watch a movie about the experiments.

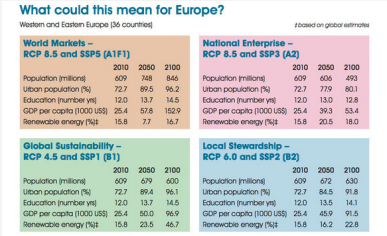
Remi Panicz from the West Pomeranian University of Technology in Szczecin presented CERES to **Polish carp breaders, scientists and stakeholders** in Słok k. Bełchatowa at the XXII national conference for carp breeders.



First **physical model runs** and summary reports are ready - identifying hotspots of change in temperature, storminess, sea level, river run off and nutrient discharge. More marine projections will be ready by mid 2017.

A workshop on distributional shifts of commercial fish stocks in relation to total allowable catches was co-chaired and organised by CERES and CimeFish members and led to **formal advice** from ICES to the EU Commission.

Face to face interviews with **Turkish sea bass and sea bream farmers** provided data for the "typical farm approach", a model exercise to estimate economical consequences of climate change for aquaculture farms in Turkey.



What could this mean for Europe?

Western and Eastern Europe (36 countries)

‡based on global estimates

World Markets – RCP 8.5 and SSP5 (A1F1)

	2010	2050	2100
Population (millions)	609	748	846
Urban population (%)	72.7	89.5	96.2
Education (number yrs)	12.0	13.7	14.5
GDP per capita (1000 US$)	25.4	57.8	152.9
Renewable energy (%)‡	15.8	7.7	16.7

National Enterprise – RCP 8.5 and SSP3 (A2)

	2010	2050	2100
Population (millions)	609	606	493
Urban population (%)	72.7	77.9	80.1
Education (number yrs)	12.0	13.0	12.8
GDP per capita (1000 US$)	25.4	39.3	53.4
Renewable energy (%)‡	15.8	20.5	18.0

Global Sustainability – RCP 4.5 and SSP1 (B1)

	2010	2050	2100
Population (millions)	609	679	600
Urban population (%)	72.7	89.4	96.1
Education (number yrs)	12.0	13.7	14.5
GDP per capita (1000 US$)	25.4	50.0	96.9
Renewable energy (%)‡	15.8	23.5	46.7

Local Stewardship – RCP 6.0 and SSP2 (B2)

	2010	2050	2100
Population (millions)	609	672	630
Urban population (%)	72.7	84.5	91.8
Education (number yrs)	12.0	13.5	14.1
GDP per capita (1000 US$)	25.4	45.9	91.5
Renewable energy (%)‡	15.8	16.2	22.8

The glossy card, explaining the concept of the **future scenarios** used in CERES is online. These scenarios include different aspects on likely developments in society, economy and policy and form a basis for all model excercises in CERES.

Key partners for stakeholder engagement met with **CERES industry partners** to refine the road map for industry and policy involvement and to contribute to socio-economic future scenarios and risk assesment.

More activities

Scientific results

Specialised spawning makes Atlantic bluefin tuna vulnerable to climate change

This review of tuna larval distributions and ecology draws together some unifying themes among tuna species, e.g. migration and spawning behaviour. Tunas are generally associated with warm sub-tropical and tropical spawning grounds and the initiation of spawning is strongly influenced by temperature. With spawning in relative small areas of the subtropical oceans, bluefin tunas show the most restricted spawning behavior in space and time of all the tuna species – making them specifically vulnerable to climate change. This behavior is most likely related to enhanced larval survival in these regions. However, the links between oceanographic mechanisms, larval feeding, growth and survival, and eventual recruitment remains largely unclear. Given the ecological and economic importance of tunas worldwide, understanding these processes is strongly relevant to sustainable management, particularly in light of previous and future anthropogenic impacts to spawning areas.

Muhling BA et al (2017) Reproduction and larval biology in tunas, and the importance of restricted area spawning grounds, Rev Fish Biol Fisheries, DOI 10.1007/s11160-017-9471-4

Jellyfish envenomation can cause severe gill lesions in cultured sea bream

In recent years repeated mass mortality episodes of farmed fish were caused by blooms of gelatinous cnidarian stingers, as a consequence of a wide range of hemolytic, cytotoxic, and neurotoxic properties of associated cnidocytes venoms. This study investigated gill disorders of gilthead sea bream after envenomations by jellyfish. Fish gills showed different extent and severity of gill lesions up to severe impacts on fish health, according to jellyfish density and incubation time, and long after the removal of jellyfish from tanks. Altogether, these results shows that jellyfish swarms may represent a high risk for Mediterranean finfish aquaculture farms, generating significant gill damage after only a few hours of contact. Due to the growth of the aquaculture sector and the increased frequency of jellyfish blooms in the coastal waters, negative interactions between stinging jellyfish and farmed fish are likely to increase with the potential for significant economic losses.

Bosch-Belmar M et al (2016) Jellyfish Stings Trigger Gill Disorders and Increased Mortality in Farmed Sparus aurata (Linnaeus, 1758) in the Mediterranean Sea, Plos One, DOI:10.1371/journal.pone.0154239

Jellyfish swarms as high risk for Mediterranean finfish aquaculture farms?

Jellyfish outbreaks in coastal areas have led to mass mortalities of farmed fish in the past. This study investigated the sensitivity of the European sea bass, a widely cultured fish in the Mediterranean Sea, to the combined effects of temperature, oxygen deficiency and jellfish stings. Fish stung with toxic jellyfish showed higher higher oxygen demands as well as gill tissue damage. This demontrates that the synergy of environmental and biotic stressors can dramatically impair farmed fish metabolic performances and increase their health vulnerability. As a corollary, in the current scenario of ocean warming, these findings suggest that the combined effects of recurrent hypoxic events and jellyfish blooms in coastal areas might also threaten wild fish populations.

Bosch-Belmar M et al (2016) Concurrent environmental stressors and jellyfish stings impair caged European sea bass (Dicentrarchus labrax) physiological performances, Nature Scientific reports, doi:10.1038/srep27929

Upcoming events - here you can meet CERES

May, 22
CERES Workshop for seabass and seabream industry jointly organinzed by Mersin University and Kılıç Seafood in Muğl, Turkey

June, 28-29
Planning Workshop for FAO Fisheries and Aquaculture Technical Paper No. 530 update, FAO Headquarters, Rome

June, 26-30
World Aquaculture, Cape Town, South Africa

July, 19-21
ICES Workshop on Regional Climate Change Vulnerability Assessment for the large marine ecosystems of the northern hemisphere, Copenhagen, Denmark

September, 3-6
EIFAAC International Symposium, Adaptation of inland fisheries and aquaculture to climate change, Stare Jabłonki, Poland

September, 18-21
ICES Annual Science Conference 2017, Ft. Lauderdale, Florida, USA

October, 17-20
Cooperation for Growth, International Conference Organized by the European Aquaculture Society, Dubrovnik, Croatia

Did you know...

... that ClimeFish is the sisterproject of CERES?

The two projects use complimentary approaches to provide tools and develop strategies allowing fisheries and aquaculture sectors and their governance to adapt to, and hopefully benefit from, climate change. Although the projects were developed separately, we are working hard to combine forces to make the best conditions possible for future Blue Growth in the aquaculture and fisheries sectors. Read more about ClimeFish, subscribe to their newletter or follow them at twitter.

Did you like this newsletter? Recommend it!

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