TAPAS

Tools for Assessment and Planning of Aquaculture Sustainability

NEWSLETTER

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After one year of the TAPAS project, the consortium partners held their 1st Annual meeting in Malta in April 2017. Over two days, partners reviewed all the completed tasks, discussed ongoing activities and planned the next phase of work for the second year of the project. The next annual meeting will be held in Hungary next year in spring time.

RECENT STATE AND ACTUAL TASKS

- √ Stakeholders have been involved
- √ First survey of existing regulatory frameworks in the EU has been finished
- √ Partners have evaluated the existing models and identified possibilities for improvements
- √ Available existing datasets on environmental impacts of aquaculture have been compiled
- √ Case study research plans have been finalised, research activities within 10 case studies have started
- √ The first version of the exploitation has been prepared

The **TOOLS FOR ASSESSMENT AND PLANNING OF AQUACULTURE SUSTAINABILITY** (TAPAS) Consortium consists of 15 partners from nine EU member countries (Denmark, France, Greece, Hungary, Ireland, Malta, Spain, The Netherlands, United Kingdom) and one associated country (Norway). A wide range of institutions take part in the project, including universities, fisheries research institutes, marine research institutes, non-profit organizations and others.

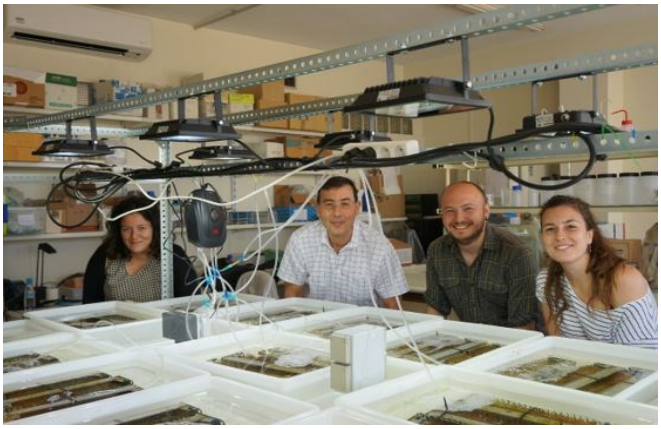
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 678396

CRITICAL EVALUATION AND SUGGESTION

The report of the critical evaluation and suggestion of new and existing models was created to compare and evaluate key models that could be used by stakeholders for planning and management of sustainable aquaculture. The report was completed within the first four months of the project and covers near-field models, as farm level to water-body scale currently used for either regulatory or scientific purposes to assess nutrients/wastes. The evaluation included the most relevant models for European aquaculture systems, including marine fish, shellfish and freshwater cages and ponds and highlighted their strengths, weaknesses and potential areas for improvement.

TAPAS MEETING SETS THE EXPERIMENT PLAN

Protocols are all set for the ecotoxicology and monitoring experiments in Spain led by the University of Murcia and the IMDEA Water Institute. The eastern Mediterranean case-study just started and finishes end of September. The laboratory experiments will assess the toxicity of antibiotics and metals used in fish farms to marine biofilms and to see the chemical intake and potential side-effects on two marine benthic invertebrate species. The data generated from these studies will be used to refine environmental threshold concentrations for these pollutants as well as to set the boundaries of the impact zone of Mediterranean fish farms.



TAPAS POSTER PRESENTATION IN LATVIA

Network of Aquaculture centres in Central and Eastern Europe (NACEE) with a Daugavpils University hold the 2nd International Aquaculture Conference Recirculating aquaculture systems (RAS): Life Science and Technologies on the 4th of May at the Daugavpils University (Latvia). The conference was addresses not only to researchers, but also to a production sector. Representatives from 10 countries participated: Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Poland, Russia, Ukraine. New sustainable freshwater recirculation technologies for commercial use were discussed, like pond-in-pond, indoor RAS and others. During the conference, TAPAS project was presented to the stakeholders by the NACEE technical secretary, Mrs Szvetlana Lengyel. A poster presentation and flyers gave a basic information about the project, while personal talks and meetings made an important contribution. Central and Eastern European aquaculture industry showed an interest in the TAPAS projects and its future results.

Mr.Péter Lengyel, a General Secretary of NACEE and a deputy head of the Department of Angling and Fisheries Management, Aquaculture Development Unit, Ministry of Agriculture of Hungary and Dr. Zubkov Elena from the Institute of Zoology of the Academy of Sciences of Moldova.

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THE NORWEGIAN CASE STUDY

The Norwegian case study area is the Hardangerfjord, Western Norway. The Hardangerfjord is 179 km long and is the third longest fjord in the world. Parts of the fjord is quite deep with depths of more than 800 meters.

Photo: Roar Christiansen, Bergens Tiende

The case study area is one of the most aquaculture intensive areas in Norway, with an average production of salmonids as salmon and rainbow trout of around 72.000 metric tons per year. The farming is almost exclusively carried out in open sea cages. Since 2010 there has been a special regulation applying for this area. This imply that the Hardangerfjord is divided into zones, with coordinated anti-parasite treatment and coordinated fallowing periods within the zones. The main purpose of the case study is to provide data for validation of modelling work carried out in TAPAS, and the sampling campaigns include in-situ measurements of a wide range of parameters (physical, chemical and biological. The TAPAS WP 4 will assess the combined environmental and social impacts of aquaculture. The Hardangerfjord region has been an important European tourist destination since the 19th century, and some of the most amazing hikes in Norway are in the Hardangerfjord region- and the Trolltunga, the four waterfalls trail in Husedalen valley, HM Queen Sonja's panoramic hiking trail and the Hardangervidda National Park is one of Norway's most renown. Hence tourism is a very important industry in the region.

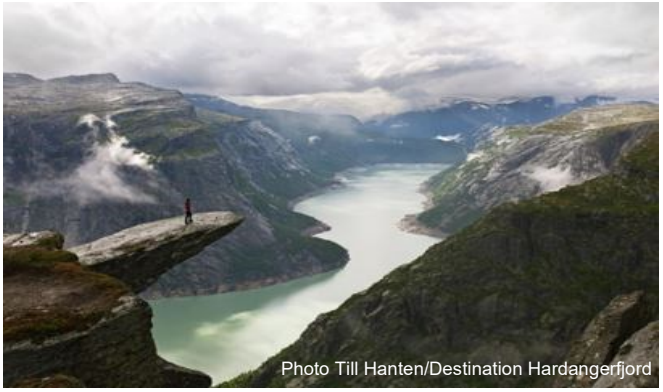

Photo Till Hanten/Destination Hardangerfjord

INTRODUCTION OF TAPAS PARTNERS

The Network of Aquaculture in Central and Eastern Europe (NACEE) is a non-profit organization, registered in Hungary. It is a voluntary union of Central and Eastern European aquaculture related stakeholders from 9 countries (Belarus, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Poland, Russia, and Ukraine). The organisation has strong involvement in the R&D sphere within the European Research Area. Substantial expertise in all aspects of inland and Black Sea marine systems. NACEE provides exchange of information among Eastern, Central and European countries, assists the organization of regional aquaculture meetings and conferences and facilitate the improvement of partnership between science and practice, with a special regard to SMEs and producers. NACEE has 3 official languages (English, Russian and Hungarian), but its day-to-day operation includes also several local languages of its members. It assures NACEE can collect, pass and distribute any information on a wide regional level. This feature is especially important for the WP9 of the TAPAS project, dealing with dissemination.

The Norwegian Institute for Water Research (NIVA) is Norway's leading institute for basic and applied research on marine and freshwaters. The institute's research comprises a wide array of environmental, climatic and resource-related fields. NIVA's world-class expertise is multidisciplinary with a broad scientific scope. Their profile is including combine research, monitoring, evaluation, problem-solving and advisory services at international, national and local levels. NIVA expertise on environmental impacts of/on salmon aquaculture, hereunder EIA and carrying capacity assessment; hydrodynamic, biogeochemical and ecosystem modelling and in-situ monitoring; bio-economic modelling and valuation of ecosystem goods and services; participatory approaches, stakeholder involvement and empowerment; participates in Norwegian Ferrybox network with direct access to large scale in-situ data and long-time monitoring data. NIVA is having an important role in the WP4 A in assessing the ecosystems services provided by European Aquaculture.

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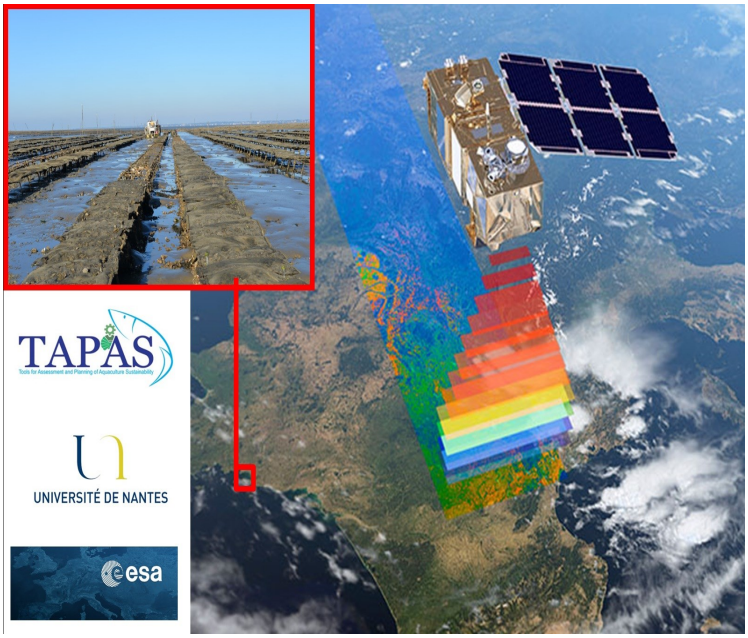
SHELLFISH AQUACULTURE FROM SPACE

Since the launch of the Sentinel-2A and 2B satellite constellation by the European Space Agency, new opportunities opened for aquaculture monitoring from Space. Due to its high spatial resolution (20 m), high revisit time (5 days), and ability to sense the colour of the ocean in the visible and near-infrared, Sentinel-2 made it possible to analyse the distribution of chlorophyll concentration and turbidity – two water quality parameters influencing shellfish life cycle – at the scale of an oyster farm. This could be used to monitor water quality in farming areas, identify new sites offshore, or to assess the differences in chlorophyll concentration (a proxy of available food for shellfish) across an existing farm area, which may have implications for shellfish growth and production.



Research results from a shellfish farming case-study had been published in Frontiers in Marine Sciences* by Pierre Gernez and Laurent Barillé from the University of Nantes, in collaboration with David Doxaran from the Laboratory of Oceanography in Villefranche-sur-mer, France. The study was focused on Bourgneuf Bay, a macrotidal bay along the French Atlantic coast, widely used for shellfish aquaculture. The bay is mostly constituted of mudflats, and in this turbid environment suspended particulate matter (SPM) concentration is generally high (i.e., SPM concentration regularly exceeds 50 g m^{-3}). As a too high SPM concentration impacts oyster clearance rate and other physiological functions, oyster growth can be negatively impacted by high SPM concentration during certain hours of the day in several areas of the bay. Satellite remote sensing made it possible to assess when and where oysters were impacted by the high turbidity. One of the most striking results of the article by Gernez et al. was that oysters were mostly impacted by turbidity during spring tides, despite the high concentration of microalgae concurrently available for feeding. The full article is available online in open access.

This study highlights the potential of Earth Observation for aquaculture spatial planning, and offers a generic framework where the combination of high resolution ocean colour satellite remote sensing with bivalves ecophysiological model makes it possible to explore the response of cultivated suspension feeders to environmental conditions in many coastal areas. This research has been supported by the H2020 TAPAS project, which is aimed at developing tools, approaches and frameworks to support EU Member States in implementing the Strategic Guidelines for the sustainable development of European aquaculture and delivering a technology and decision framework for sustainable growth.

*Gernez P., Doxaran D., & Barillé L. (2017). Shellfish aquaculture from space: potential of Sentinel2 to monitor tide-driven changes in turbidity, chlorophyll concentration and oyster physiological response at the scale of an oyster farm, Frontiers Marine Sci., 4: 137, doi: 10.3389/fmars.2017.00137

Website:
www.tapas-H2020.eu

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