

# Water as a Food Resource

## Webinar

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## Agenda

ESA Welcome and Introduction

About ESA's Water as a Food Resource Competition

Water as a Food Resource and Space

How to Apply to the Water as a Food Resource Competition

Quest Speaker - Nina Kickinger United Nations Office for Outer Space Affairs Space4water

**Q&A** Session

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space transportation

earth observation





telecommunications and integrated applications



navigation

exploration







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European Space Agency

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## ESA SPACE SOLUTIONS



Zero-equity funding (from €50k to €2M+ per activity)

A personalised ESA consultant

Technical support and commercial guidance

Tailored project management support

Access to our international network of ESA and partners

Access to our network of investors

Credibility of the ESA brand



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Water as a Food Resource ESA's Kick-Start Competition

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## Water as a Food Resource: An Introduction



Global population expected to exceed nine billion by 2050 pressures are placed on existing food systems

The over-exploitation of land and intensive agriculture practices have been the causes for large sanitary crises

The production of food from the oceans and in-land aquaculture will relieve some of the pressure that has been put on agriculture

A way to obtain significantly more food and biomass sustainably from the ocean is to harvest seafood that on average is from a lower trophic level than we currently harvest "Food from the Oceans - High Level Group of Scientific Advisors Scientific Opinion No. 3/2017 - European Commission"





## Water as a Food Resource: About the Kick-Start

The "Water as a Food Resource" Kick-Start offers support and funding to companies developing services to help exploring new food resources related to water

The competition opens on 08 April 2022 and closes on 27 May 2022

If you are interested in applying please submit a proposal between the opening and closing date



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## Water as a Food Resource: About the Kick-Start

Winners of the competition will run a 6 month study, called a Kick-Start

## During the Kick-Start teams will:

- 1. Engage with users and potential customers of the proposed service
- 2. Assess the technical feasibility of the service
- 3. Develop the business model and plan

# ESA will provide funding of 75% for a maximum of ${\rm {\pounds 60K}}$ to each winning team

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## **Topics of Relevance**



We would like to see ideas covering the following topics submitted to the Water as a Food Resource Kick-Start:

## 1. Fish Farms and Fishing in remote locations

Fish farms are either located in fresh water or sea water where they are usually deployed as floating infrastructures with fish cages

However, fish farms close to gulfs / bays are vulnerable to diseases and parasites due to lack of water refreshment and the accumulation of pollutants

Space solutions to help in identifying most suitable locations for deployment, effective monitoring and operations management of facilities, data and voice communications to fishing vessels. as well as to mitigate the environmental impact of fish cages



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## 2. Precision Fishing

Advanced tools and technologies to optimise fishing operations and management

Monitoring = Water quality, water currents, stock health and quantity, performance and anomalies of the infrastructure, fish catch discards = precision fishing

Space applications to help establish effective communications, monitoring (oysters, algae, catch discards), appoint the correct position of assets (free floating buoys), promote hybrid infrastructures



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## **Topics of Relevance**

## 3. New Food from Oceans

Cultivated algae could be a solution for solving the issue of growing populations which face the shrinking of natural resources

Algae is a fertilizer, a resource for bioenergy, food for livestock and aquaculture, ingredient for cosmetics, pharmaceutical and dietary supplement

Algae production in Europe remains limited by a series of technological, regulatory, and market-related barriers

Satellite downstream services could scale up macro & micro algae cultivation, assist new conceptual hybrid infrastructures (offshore wind farms / algae farms), protect eco-systems



## 4. Safety and transparency

Illegal fishing weakens economic activity, escalates national tensions and endangers ecosystems

Some fish species have been extinct or are endangered and miss to present sustainable food source for consumption

Remote fish farms or new food sources will be attractive targets to breach. It is also key to ensure transparency of the operations to gain public trust and provide high quality products

Services for geofencing to control high sea farms access. Adequate communications and broadband for facilities in the open sea, Geo tagged information to testify that fish were caught in specific areas and provision of certificates of origin







## Satellite Communications (SatComs)

- SatComs will provide connectivity to remote locations such as coastal lines, isolated lakes, open sea infrastructures. Such connectivity is essential where no other network is available
- SatComs is an immediate and scalable solution since instant "deployments" can take place to provide services (voice / data)
- SatComs is a versatile technology since it can be integrated with IoT
- IoT systems making use of SatComs are instrumental for monitoring infrastructures, locations, natural conditions and provide plethora
  of information essential for the food production, the operational status of facilities or the environmental conditions met at the
  monitored site





## Satellite Navigation (SatNav)

- SatNav data can be used for locating and geo-referencing new sites of deployment, and for generating geo- and time reference sensor information of deployed IoT systems
- SatNav enabled devices can ensure traceability of origin of captured fish and establish geo-fencing around mariculture sites

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## Satellite Earth Observation (SatEO)

- SatEO data can provide instrumental information for the identification of the best sites for establishing new farms
- The data can also contribute to the monitoring of the site to assure that the climate and environmental conditions (e.g. quality of the water, salinity, turbidity) meet the requirements
- SatEO based models can forecast water quality and metocean conditions and provide essential information to farm managers

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## Satellite AIS

- · Satellite AIS data provide valuable insights on ship movements and situational awareness at sea
- Manage vessels traffic and control access in remote fish farms or restricted fishing areas

There are <u>other technological innovations</u> that could support the development of Water as a Food Resource.

Digital twins of fishing vessels such as shrimp fishing vessels used for shellfish production could operate and facilitate complex tasks that these vessels have to conduct

Unmanned Underwater Vehicles (UUV) can be deployed in the open sea to monitor the condition of a new fish farm trend the submersible cages

Who can apply?

- To be eligible for funding, your team must be based in one of the following countries: Belgium, Czech Republic, Denmark, Estonia, Finland, France, Hungary, Ireland, Italy, Lithuania, Luxembourg, Norway, Poland, Portugal, Romania, Spain, or Sweden.
- If you are considering applying, you must inform your National Delegation to obtain a letter of authorisation allowing the funding of the proposed activity.
- Contact details of each National Delegate can be found here: <u>https://business.esa.int/national-delegations-0</u>
- Please note that currently, Austria, Greece, and Switzerland are not supporting Kick-Start activities. Germany, the United Kingdom and the Netherlands have opted out of supporting this particular Kick-Start initiative.
- However, if your team is based in Luxembourg and Norway you do not have to contact your National Delegate. The Luxembourgish and the Norwegian Delegations have pre-authorised this Kick-Start opportunity.





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How to apply



### 1. Register your team on esa-star Registration today! https://esastar-emr.sso.esa.int

- 2. When the Kick-Start opens on 08 April 2022 visit esa-star Publication and search for this Water as a Food Resource opportunity to download the official competition documents. <u>https://esastar-publication.sso.esa.int</u>
- 3. Use the official documents to prepare your proposal
- 4. Reach out to your National Delegate (if applicable) to request a Letter of Authorisation. Contact details of each National Delegate can be found here: https://business.esa.int/national-delegations-0
- 5. Submit your proposal via esa-star Tendering before the deadline of 27 May 2022. <u>https://esastar.sso.esa.int</u>



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## Proposal Template

## Your Proposal should include the following information:

- 1. Executive Summary (max 1 page)
- 2. Business Potential (max 5 pages)
- 3. Technical Concept (max 5 pages)
- 4. Team and Resources (max 3 pages)
- 5. Management (max 4 pages)
- 6. Financials (max 2 pages)



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## Overall Aim of the Kick-Start



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## Checklist

Before applying, check that:

- 1. Your team is proposing a service that could become operational in the near future (1-4 years)
- 2. Your idea tackles a challenge relating to water as a food resource
- 3. Your idea uses satellite data or space technology like satellite communication, earth observation or navigation
- 4. Your team is eligible for funding and has attained a letter of authorisation from the National Delegate (if applicable)
- 5. There is a market for your service and potential users/customers will be involved in the Kick-Start

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