
ITALY-CHINA FRAMEWORK FOR COOPERATION ON THE BLUE GROWTH

Technological areas of collaboration proposed by the BIG TC
following the networking e-meeting of 15.07.2020



www.clusterbig.it

With the kind support of



Climate change and renewables

Studies and models for assessing the risks and vulnerabilities related to climate change, with particular reference to marine ecosystems, coasts, water resources, health and economics, BIG members make use of an interdisciplinary approach between different departments and it can also benefit from the calculation capabilities of the new CMCC supercomputing infrastructure in the Top500 of the most powerful supercomputers in the world, which allows producing simulations of the climate system on a global and regional scale with increasingly refined definition levels, thus improving the quality of the scenarios products and the ability to analyze the interactions between the climate, ecosystems and socio-economic systems.

The areas of collaboration proposed concern the development of advanced multi-risk analysis methodologies for the marine and coastal environment, and tools and methods for the analysis of complex systems development of approaches for the analysis of the degradation and loss of ecosystem services:

- Integration of open-source data from observation networks, models for the projection of territorial and oceanographic climatic variables, and planning tools for spatial-temporal analysis and modeling of danger-exposure factors and vulnerabilities.
- Definition of strategies and adaptation plans, also based on nature-based solutions and green infrastructures.



Ligurian District
of Marine
Technologies
(DLTM)
Davide Marini
Letizia De
Fabritiis
Erika Schierano

Climate change and renewables

The DLTM created an advanced monitoring system, complementary to the existing ones in the Ligurian sea. The Mare Laboratory (realized together with ENEA, CNR, INGV, and IIM) is composed of 2 marine observers in the area of La Spezia: an offshore one is placed to the depth of 600 meters, in front of the coast of the Cinque Terre, while the coastal observatory is installed to the depth of 10 meters to the entrance of the La Spezia Gulf.

Submarine stations have instruments that monitor geophysical and oceanographic parameters (like pressure, temperature, current speed, sedimentation, etc..) to study climate change and protect marine ecosystems.

All parameters from submarine observatories are analyzed through a DLTM Supercomputing cluster, as the DLTM has an HPC infrastructure for data analysis, machine learning, and artificial intelligence.

Development of marine environmental monitoring stations with particular reference to geophysical and oceanographic parameters suitable for studying climate change and protecting marine ecosystems.

The collaboration area can be integrated with that of the theme previously exposed and which involves the Ca 'Foscari University of Venice, with particular reference to the creation of integrated observation networks and monitoring systems.



www.clusterbig.it

Waveenergy.it

Felice Arena

Climate change and renewables

Conversion system of wave energy into electricity, for the transformation of port dams from "passive" infrastructures, built to protect a water surface of the port, to "active" infrastructures, ie capable of capturing the energy of the waves of the sea and convert it into electricity (REWEC system)



www.clusterbig.it

Università Ca'
Foscari Venezia
Roberto Pastres

Fishing & Aquaculture

As regards aquaculture, cooperation can be proposed on the theme of precision aquaculture, applied to extractive species such as macroalgae and mollusks, belonging to low trophic levels, on the modeling of cultivation and breeding processes, aimed both at optimizing management practices and planning of optimal marine areas, from the point of view of minimizing environmental impacts.



www.clusterbig.it

Università degli
Studi della Tuscia
Giuseppe
Scapigliati

Fishing & Aquaculture

The areas of collaboration concern the immunology of fish species, the production of vaccines, and the study of their effects on the protection of fish species.

Development and characterization of innovative and low environmental impact feed and evaluation of their effects on the health of fish species.



www.clusterbig.it

Fishing & Aquaculture

Another emerging issue at European level concerns the quality and traceability of the origin of the fish species, to safeguard the final consumer and as a lever for positioning of the product on the high-end of the market.

The innovative technologies concern DNA barcoding (genetic barcode with which to obtain a new type of cataloging and definition of living organisms through a small DNA sequence).

The possibilities of using Barcoding are numerous, but in this specific case, the application concerns support for labeling and traceability of fish. DNA-Barcoding can be used successfully for the identification of fish species, giving a fundamental contribution to correct labeling of fish products, such as required by the EC Regulation.



Consorzio
Italbiotec
Diego Bosco
Ilaria Re
Martina Ferrini

Blue Biotechnology for pharmaceutical, nutraceutical, and cosmetic use

Areas of possible cooperation are focused on innovation, investment management, scientific communication, and training, thanks to the proven experience in:

- Fundraising, Grant Writing and Project Management
- Project accounting and Audit
- Technology transfer services
- Development of Business Plans, Market Studies, and technical services such as Life Cycle Analysis (LCA), Due diligence, and Impact assessment.

Finally, particular attention is paid to communication activities and dissemination of results, thanks to the organization of events and information campaigns, as well as specialistic training courses in technical and organizational behavior fields.



www.clusterbig.it

Biosearch

Adrianna Ianora

Blue Biotechnology for pharmaceutical, nutraceutical, and cosmetic use

The areas of possible collaboration concern the development, starting from the clinical pre-trials phase, of innovative products from marine microalgae, with particular reference to new proprietary products in the pharmaceutical, nutraceutical, and cosmeceutical sectors.

The developed products can be the subject of specific collaborations with other companies in the sector for the completion of development and introduction on the market, through partnership strategies based on advance payments, milestones, and royalties.



www.clusterbig.it

Blue Biotechnology for pharmaceutical, nutraceutical, and cosmetic use

Potential collaborations are identified in the development of sensors aimed at seawater, aquaculture and food/products from marine origin, to ensure good conditions for monitoring or for using, in a simple and low-cost way.

Sensors are also considered in a circular economy perspective, exploiting materials of marine origin for the development of biomimetic sensors, prepared with electrochemical methods. The results of all these researches are mainly applied in the environmental and biomedical fields.

A recent field of interest is the application of electrochemical methods and sensors to the problems related to the conservation of cultural heritage, in particular for the analysis of dyes and pigments, pictorial binders, and photographic material. Recently, original know-how has developed in the field of manufacturing and analytical application of arrays of nanoelectrodes, nanostructured electroactive membranes, and polymer-based electrodes. One of the recent results has been the development of a polymer-based electrode (patent) for PFAS measurements.



Stazione
Zoologica Anton
Dohrn
Ferdinando
Boero

Towards an Italy- China Joint-School on Marine Biodiversity and the Functioning of Ecosystems

The theme of safeguarding biodiversity and the functioning of marine ecosystems has a proven track record of research institutes and universities in Italy.

Areas of possible collaboration concern:

- Exchange of Italian and Chinese researchers on BEF issues both in laboratories at leading Italian universities and research centers and with training provided by Italian professors at Chinese institutes/universities on the issues of biodiversity and the functioning of marine ecosystems.
- Joint projects on the observation systems of ocean environments, also with robotic technologies, and on the rewilding and ecological restoration of marine ecosystems.



www.clusterbig.it

The webinar in question falls within the framework of the Memorandum of Understanding signed in December 2018 between Cluster BIG and the Municipality of Haiyang (China).

The meetings, favored by the mediation of the member CDS - Città Della Scienza, will continue in order to give substance to the themes already suggested by the interested parties.

Wanna join these initiatives?

clusterbig@gmail.com

The logo for Cluster BIG, featuring the letters 'BiG' in a blue, sans-serif font. The 'i' has a green dot, and the 'G' has a red dot. Below the letters is a blue horizontal bar with the text 'Blue Italian Growth' in white, and 'Technology Cluster' in a smaller white font below that. The logo is set against a white square background which is placed over a blue water texture.

BiG
Blue Italian Growth
Technology Cluster

