Consiglio Nazionale delle Ricerche | Dipartimento Scienze del Sistema Terra e Tecnologie per l'Ambiente

Department of Earth System Sciences and Environmental Technologies

DSSTTA coordinates and promotes scientific research to advance understanding of the Earth as a dynamic system

CONTENTS

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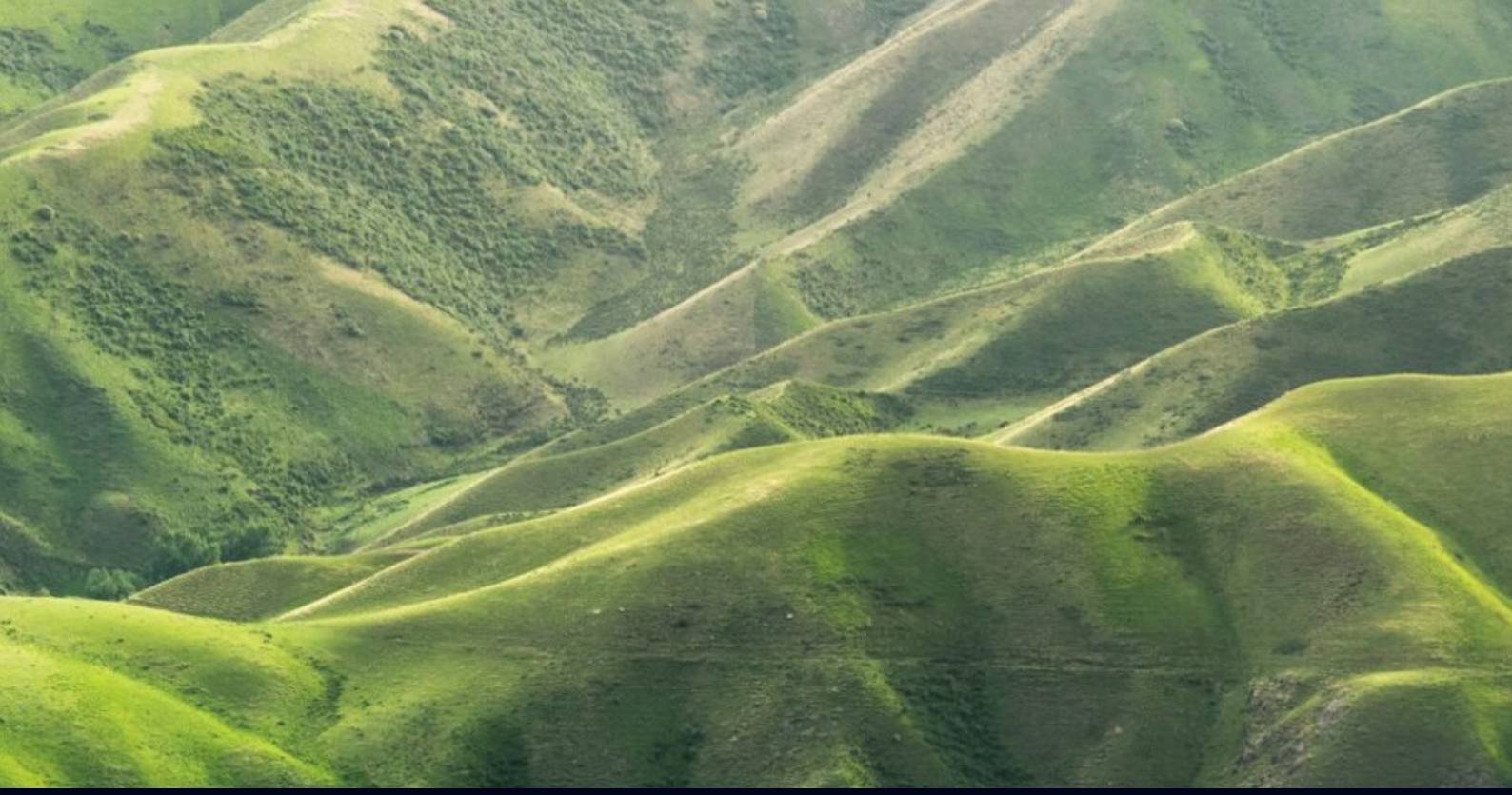


anding how the Earth’s systems
ersity, and more) are deeply
are affected by human activity

DSSTTA Department

Promotes scientific collaboration between institutes by coordinating transdisciplinary project activities and thematic working groups.

It provides support in planning strategic and innovative initiatives, facilitating the positioning of excellence and strategic priorities.

DSSTTA also engages in institutional support activities related to research and the promotion of national and international relations, collaborating with the relevant CNR offices.

The Department combines measurement and modeling approaches to study the environment, with particular strength in collecting environmental data across the country, both remotely and in situ.

DSSTTA also focuses on the interconnectedness of the planet's components-climate, cryosphere, biodiversity, and others-and the impact of human activities on them.

mission

DSSTTA's mission is to advance knowledge of the environment and the Earth through the integration of different competences and disciplines, fostering technological development and the systemisation of data and infrastructures. DSSTTA promotes the role of science as a neutral support for socio-political-economic decisions, particularly environmental matters, based on merit and respect for the scientific method.

In line with CNR's values, DSSTTA aims to create added value through scientific research, generating knowledge, fostering community interest, promoting sustainable use of resources and upholding research ethics and freedom. It also engages in outreach to raise public awareness of environmental issues and related emergencies, such as climate change and pollution, highlighting the importance of research in the global socio-political context.

Promotion, Proposal, Pr

ogramming, Coordination

Strategic Areas

Earth System Sciences and Geo-Resources

Study of planetary and geological processes, monitoring of natural resources and development of sustainable models for resource management and use. Assessment of environmental impacts and definition of strategies to mitigate supply crises and climate change.

Anthropogenic Impacts and Technologies for Environmental Remediation

Ecosystem impact assessment, with a focus on emerging contaminants. Development of eco-innovative technologies for environmental monitoring, protection and recovery of ecosystems. Development of interoperable environmental analysis systems for decision support.

Global Changes

Study of the climate dynamics and biogeochemical cycles of the planet, with analysis of extreme variations and tipping point. Global and regional climate projections, and palaeoclimatic reconstructions based on geological archives. Development of new adaptation and mitigation strategies in line with international policies.

By studying environmental data and using advanced modelling techniques, we aim to predict future changes and identify necessary adaptation strategies.

Earth Observation

Multidisciplinary research to study the atmosphere, biosphere and geosphere and the ocean system. Integration of in situ observations, remote sensing and satellite data, supported by modelling and management of large interoperable databases to study geological, geophysical and environmental processes.

Natural Risks

Assessment and monitoring of natural hazards such as eruptions, earthquakes, floods, droughts and fires, with the development of warning and mitigation systems. Analysis of climate change and the hydrological cycle. Study of marine phenomena for coastal risk management and emergencies related to extreme events and subsidence.

Biodiversity, Ecosystems and Biological Resources

Study of terrestrial and aquatic ecosystems, biodiversity and ecological interactions for conservation and sustainable management. Assessment of ecosystem response to natural and anthropogenic forcing. Promotion of circular economy through sustainable use of biological resources, with focus on ecosystem services and sustainable bio-economy.

Working Groups

Working groups facilitate department-institute, inter-institutional and inter-departmental connections. Covering all disciplinary fields and areas of research management in the Department, these groups aim to develop common research themes, foster transdisciplinary pathways, enhance networking, generate new ideas, and promote participation in joint calls and initiatives.

Technical and institutional groups

Communication

International cooperation

Dissemination

Project Management

Infrastructure

Post PNRR Strategy – Bio Technology Transfert

Thematic groups

Environment and Health

Internal areas, marginal and ultraperipheral territories

Biodiversity

Climate Change

Carbon Cycle

Seabed

Geodynamics

Planetary Geosciences

Mountains

Multi hazard

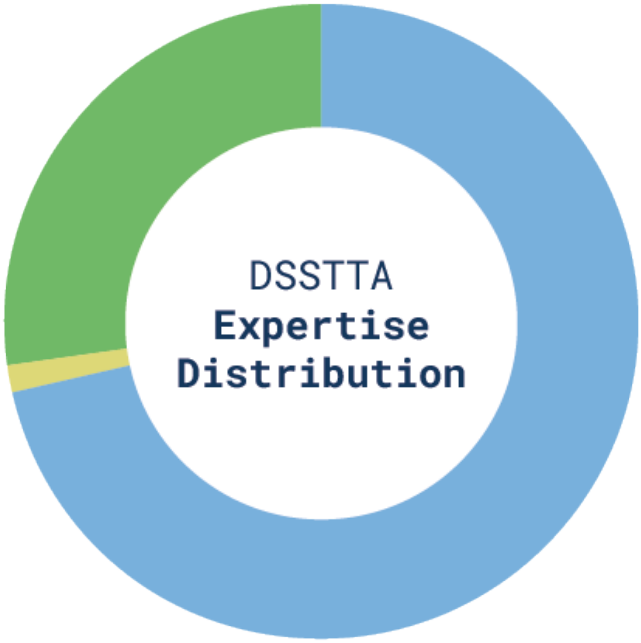
Nature, Research and Society

Paleoclimate

Drought, scarcity and water crisis

FOR MORE INFORMATION
VISIT DSSTTA's WEBSITE

Department Activities



71,6% Physical Sciences and Engineering

PE10 PE4 PE5 PE6 PE8

1,4% Social Sciences and Humanities

SH6 SH7

27% Life Sciences

LS7 LS8 LS9

* categorized by ERC panels

FOR MORE INFORMATION
VISIT DSSTTA's WEBSITE

The activities of CNR DSSTTA represent the beating heart of our commitment to innovation and environmental sustainability. Through a series of targeted projects, we are dedicated to exploring new scientific and technological frontiers, significantly contributing to the understanding and protection of our planet.

Our activities not only support advanced research, but also promote interdisciplinary collaboration, which is essential for addressing global environmental challenges.

We focus on the interconnectedness of the planet's components -climate, cryosphere, biodiversity and more-and the impact of human activities on them.

FOR MORE INFORMATION

DEPARTMENT CALLS

The Department issues a wide range of calls, including dedicated opportunities for early career scientists, to support and promote the development and implementation of research projects, as well as fostering communication and dissemination initiatives, both within its strategic areas and across the transdisciplinary spectrum.

INTERNATIONAL COOPERATION

The International Cooperation Section within DSSTTA aims to play a key role in coordinating and managing scientific and development cooperation activities across the Department's 12 institutes, adopting a broad global approach. Its objective is to ensure effective collaboration between the institutes and various international coopera¬tion agencies working in the field, towards a greater understanding of global challenges within the three dimensions of sustainable development: economic, social and environmental.

FOR MORE INFORMATION

FOR MORE INFORMATION

PROJECTS

The Department participates in and/or coordinates nationally and European funded projects on various topics in environmental sciences, aimed at advancing research, innovation and infrastructural development. Many projects involve the collaboration of personnel also belonging to CNR institutes.

Department Activities

PROGRAMS AND PARTNERSHIPS

FOR MORE INFORMATION

The Department participates in national and international initiatives to coordinate joint funding aimed at developing research and innovation activities. It also coordinates the participation of the research community in scientific bodies and international associations, in close coordination with the CNR's European and International Relations Unit.

RELATIONSHIP WITH COMPANIES

FOR MORE INFORMATION

DSSTTA adopts strategies to promote technology transfer within its scientific network. This activity is conducted through meetings and discussions with the CNR UVR Office and the organization of initiatives and events aimed at creating synergies between companies, Departments and Institutes. The Department's commitment to technology transfer also includes the promotion and management of agreements and projects that actively involve companies, as well as the identification of procedures aimed at establishing spin-off and consortium companies.

POLICY SUPPORT

FOR MORE INFORMATION

DSSTTA promotes and manages national initiatives and projects, collaborating with territorial Entities and Institutions. At national-level, it constantly seeks new opportunities for collaboration with Public Administrations and Research Institutions.


D
Compare
Indicators
Templates
Alert
Ideas

Infrastructures

We connect data and science to understand and protect our planet

The environment can be studied and understood by integrating measurements and modeling approach.

The Department combines both approaches, but its standout activity lies in the remote and in situ collection of environmental data across the country. This includes measurements in the atmosphere, on soils and in urban centers, and in coastal and marine areas, including the deep sea.

FOR MORE INFORMATION
VISIT DSSTTA's WEBSITE

The Department combines measurement and modeling approaches to study the environment, distinguishing itself through the collection of environmental data

ESFRI AND INTERNATIONAL CONSORTIA

FOR MORE INFORMATION

The Department, with its network of institutes, participates in and/or coordinates the national nodes of several research infrastructures of the environmental sector, under the National Research Infra structure Plan (PNIR) and the ESFRI/ERIC domain, covering the atmosphere, geosphere, hydrosphere and biosphere domains.

FACILITIES

The Department supports the network of Institutes in defining common infrastructure access protocols, manages a number of research stations and laboratory networks of multidisciplinary interest, and- in collaboration with other Italian public bodies- promotes the adoption of open data policies.

FOR MORE INFORMATION

DATA MANAGEMENT

FOR MORE INFORMATION

The Department is committed to supporting the network of Institutes in identifying best practices in data managemen and stimulating the adoption of open and interoperable policies for data handling.

Outreach Initiatives

The Department coordinates communication and outreach initiatives through a shared strategy co-designed and co-implemented with its scientific network, while also supporting the activities of the CNR Communication and Press Units in alignment with the organization's strategic guidelines.

DSSTTA promotes an integrated communication and dissemination strategy aimed at engaging both internal and external stakeholders by strengthening ties with its scientific network and with broader audiences, including national and international research institutions, students, citizens, and private companies.

This strategy is carried out through joint actions with the Press Office and the Public Relations and Integrated Communication Unit, such as the development and promotion of transdisciplinary scientific exhibitions and public exhibits, as well as through the coordination of dedicated initiatives involving the Department's affiliated Institutes, in collaboration with other CNR Departments and Offices.

To foster synergies and coordination between the Department and its Institutes, and to encourage interaction among them, DSSTTA regularly organizes events, conferences, and workshops. These activities enhance the Department's networking and cross-fertilization efforts, which are also supported by inter-institute and inter-departmental working groups.

In parallel, DSSTTA leads communication initiatives aimed at developing a dynamic network for the exchange of ideas, best practices, and innovations, including the Department's newsletter.

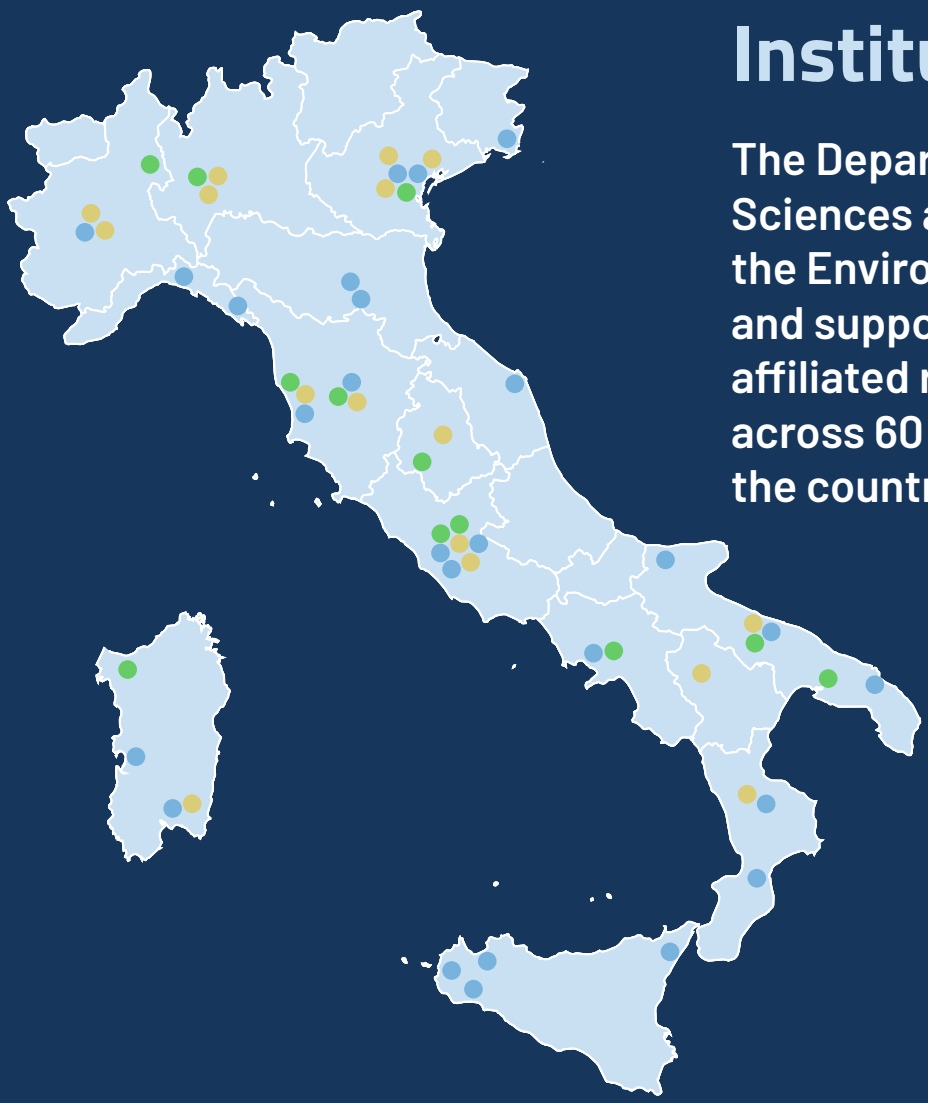
Coordinated activities among the Institutes – focused on project development, infrastructures, institutional objectives, outreach, science policy, and scientific diplomacy - give rise to targeted actions aimed at engaging external stakeholders and enabling participation in outreach events at both national and international levels.

FOR MORE INFORMATION
VISIT DSSTTA's WEBSITE

FOR MORE INFORMATION

TERRA & AMBIENTE NEWS

Terra & Ambiente News is the monthly newsletter of DSSTTA CNR, an initiative aimed at facilitating access to news, updates and collaboration opportunities for the departmental scientific network. Acting as a discussion forum for the staff to share projects, achievements and challenges across various research and technological fields, it aims to promote interaction opportunities among the different Institutes.



Institutes

The Department of Earth System Sciences and Technologies for the Environment coordinates and supports the network of 12 affiliated research institutes across 60 locations throughout the country.

1500 STAFF MEMBERS
TEMPORARY & PERMANENT

800 COLLABORATORS
AND PERSONNEL IN TRAINING

12 RESEARCH INSTITUTES

60 LOCATIONS
on the Italian territory

CNR IAS
ISTITUTO PER LO STUDIO DEGLI IMPATTI ANTROPICI E SOSTENIBILITÀ IN AMBIENTE MARINO

Institute for the Study of Anthropic Impact and Sustainability in the Marine Environment (IAS)

HEADQUARTER: GENOVA

SECONDARY OFFICES: ROMA, ORISTANO, PALERMO, CAPO GRANITOLA, CASTELLAMARE DEL GOLFO

THE INSTITUTE IN NUMBERS

113 STAFF UNITS

23 LABS & FACILITIES

The meteo-oceanographic observatory Western 1 Mediterranean Moored Multi-sensor Array (W1M3A) (https://www.w1m3a.cnr.it)

Experimental Marine Station in the Port of Genoa (https://www.ias.cnr.it/infrastrutture/)

Motorboat Luigi Sanzo (https://www.ias.cnr.it/imbarcazioni/)

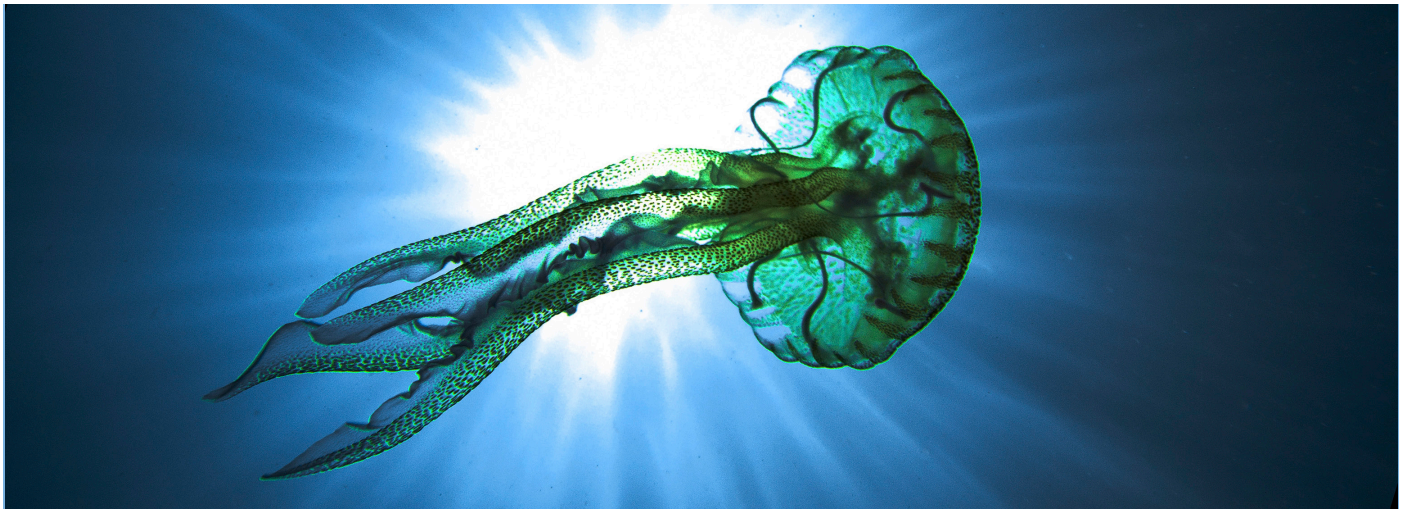
FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

The territorial distribution of the Institute, which covers four regions (Liguria, Lazio, Sardinia, Sicily), allows an ideal operational positioning to monitor a large portion of the Mediterranean Sea.

This conformation and the multidisciplinary value of the research groups that compose it have allowed the Institute to characterize the study of marine anthropogenic risks in the interface between the Anthroposphere and the Ecosphere, one of the most significant scientific challenges of the geological era just begun, the Anthropocene, in which anthropogenic activity is the main cause of territorial, structural and climatic changes on the Planet.

The key words "Anthropic Impacts" and "Sustainability", which determine the acronym, are the extreme synthesis of a new discipline, the science of sustainability (Sustainability Science), which in the Institute's project must be applied to the marine environment, through the integration of the disciplines that represent it (Environmental Chemistry, Ecotoxicology, Marine Ecology, Operational Oceanography, Ecological and Molecular Modeling, Innovative Technologies for Monitoring, Biocorrosion and Biodeterioration; Global Changes on Ecosystems), in order to mitigate the complex anthropogenic impacts and promoting real sustainability of future choices of use, production and consumption related to this fundamental environmental system.

One of the great challenges of the new era will be to finally recognize, also thanks to Communication and Public Engagement activities promoted by the institute, the fundamental role of the largest ecosystem in the universe known to date, the submerged part of the planet.



Institute on Atmospheric Pollution (IIA)

HEADQUARTER: MONTELIBRETTI

SECONDARY OFFICES: ROMA, SESTO FIORENTINO, RENDE, BARI

THE INSTITUTE IN NUMBERS

153 STAFF UNITS

22 LABS & FACILITIES

Emerging Pollutants Laboratory: High resolution GC-MS, nanotechnologies for advanced sensors

In-field measurement facilities: Liberti Observatory, Mobile speciation and emissions laboratories, custom QCM sensors

"EIRENE Environmental & Health" Laboratory (EHL)

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

Knowing and understanding air quality to act towards decarbonisation and sustainable development to protect future generations.

The mission of the CNR-IIA is part of a highly topical framework for the ecosystemic balance of the planet.

The issue of air quality and air pollution affects the world population as a whole and inevitably is the result of our habits and consumption, economic and productive activities and, last but not least, the policies of national and international decision makers.

The impact of air pollution has repercussions in everyday life and in the future will result in economic and health costs negatively effecting quality of life.

With this in mind, the institute acts towards the ecological transition by integrating skills and knowledge, monitoring and studying air quality in order to guarantee people's health and direct sustainable industrial policies and practices.

Of primary reference are the air matrix and studies on understanding and safeguarding the environment, climate and biodiversity. From an operational and methodological point of view, the Institute gathers within its offices the excellence of the researchers present in Italy, assisted by state-of-the-art laboratories, instruments and survey stations.

Research areas:

- Anthropogenic impacts on the atmosphere
- Technologies for monitoring and sharing data on air pollution
- Global changes and ecological transition

CNR - Istituto di Geologia Ambientale e Geoingegneria

Institute of Environmental Geology and Geoengineering (IGAG)

The Institute of Environmental Geology and Geoengineering (IGAG) of the National Research Council of Italy (CNR) is committed to studying geological processes and human activities that interact with the environment and impact human life. Founded in 2001 and based in Montelibretti (Rome), IGAG brings together expertise in geology, geotechnical and mining engineering, and environmental chemistry.

Its mission is to understand Earth system dynamics, assess geo-environmental risks, and promote the sustainable use of natural resources. IGAG's research lines include:

- Earth system dynamics: investigating natural geological and geophysical processes.
- Geo-environmental risks: evaluating and managing natural and anthropogenic hazards.
- Geomaterials and subsurface resources: studying and enhancing natural resources and geologic heritage.
- Environmental monitoring: developing technologies for environmental protection and remediation, with a focus on circular economy principles.
- Planetary geology: exploring geological processes on planets and satellites.

The institute operates through several territorial units and specialized laboratories, including the LARGE Laboratory, focused on risk analysis and emergency management. IGAG also actively disseminates knowledge through webinars, partnerships with public and private bodies, and educational projects for schools. With a multidisciplinary approach, IGAG contributes to environmental sustainability, territorial safety, and scientific advancement in the geosciences sector.

HEADQUARTER: MONTELIBRETTI

SECONDARY OFFICES: ROMA, CAGLIARI, MILANO, PALERMO

THE INSTITUTE IN NUMBERS

118 STAFF UNITS

36 LABS & FACILITIES

GeALab – Laboratorio di Geofisica Applicata per la geologia ambientale e l'ingegneria antisismica;

Laboratorio di diffrattometria a Raggi X (XRD) delle polveri;

Microanalisi e microscopia elettronica (LaM2)

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

Institute of Geosciences and Earth Resources (IGG)

OFFICES: PISA, FIRENZE, TORINO, PADOVA, PAVIA, MESSINA (URT)

THE INSTITUTE IN NUMBERS

165 STAFF UNITS

48 LABS & FACILITIES

IGG Geochemistry, Isotope and Geochronology Laboratory Network, mainly integrated in the European Infrastructure EPOS-ERIC

Service Structure REMOTE (Unmanned Aerial system) in collaboration with other CNR institutes (towards a CNR Research infrastructure)

Critical Zone Obsevatory Network (Western Alps, Isola di Pianosa, Etna and Dirigibile Italia CNR base, Svalbard)

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

IGG's mission is already in its name -Geosciences and Earth Resources- and can be made explicit in the sentence: understanding and managing the Earth System.

Research activities, both in situ and in laboratory, cover the whole multidisciplinary spectrum of Earth Sciences aimed at understanding the geological processes that have controlled the morphology, geological setting of oceanic and continental areas, geochemical and bio-geochemical cycles, geosphere-biosphere-hydrosphere-atmosphere interactions, geological hazards (seismic, hydrogeological, geochemical, and volcanological), and the formation and distribution of Earth Resources (water, mineral, and energy resources) of our Planet. In the last 20 years, translational research aimed at understanding and monitoring climate change and possible solutions to mitigate its effects on human society has intensified.

The disciplinary sectors of Geosciences at IGG contribute to the increasing of knowledge about Earth processes, to the optimization of the sustainable management of **Earth Resources**, to provide new tools for **geological risk** prediction and management, and finding innovative solutions to mitigate **climate change** and its effects on global society.

In the coming years, IGG will increase the integration in interdisciplinary research with other institutes in DSSTTA and the whole CNR, opening up to transdisciplinary research that includes constant synergy with non-scientific stakeholders.

Institute of Methodologies for Environmental Analysis (IMAA)

OFFICES: TITO SCALO (PZ), URT – CESMA, NAPOLI

THE INSTITUTE IN NUMBERS

162 STAFF UNITS

12 LABS & FACILITIES

ACTRIS (Aerosol, Clouds and Trace Gases Research Infrastructure)

ICOS (Integrated Carbon Observation System)

CIAO (CNR-IMAA Atmospheric Observatory)

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

The scientific mission of IMAA focuses on developing and integrating Earth Observation (EO) methodologies, both in situ and through remote sensing, for environmental analysis and modelling. This synergistic and multidisciplinary approach, based on the appropriate development of innovative techniques for interoperability and data sharing in the environmental sector, enables an innovative response to a wide range of scientific challenges.

The Institute is characterised by three lines of research : 1) Earth Observations, dedicated to the study of the atmosphere, geosphere, and Earth's surface using innovative multi-sensor and multi-platform detection techniques, along with advanced data processing techniques, machine learning, and AI, aimed at enhancing knowledge of the main geophysical and environmental phenomena in the context of sustainable development; 2) Natural, anthropogenic, and environmental risks, which focuses on the study, characterisation, and assessment of hazards arising from natural, anthropogenic, and environmental phenomena to improve the understanding of these phenomena, enhance the ability to predict their occurrence, and support strategies for countering and mitigating associated risks; 3) Anthropogenic Impacts and Technologies for Environmental Remediation, which addresses the major challenges of sustainability, particularly climate change, with a multidisciplinary approach focused on energy, environment, natural resources, economy, and society, utilising and developing methodologies, models, and techniques to enhance knowledge and contribute to the achievement of the Sustainable Development Goals of the UN Agenda 2030.

CNR IRBIM
ISTITUTO PER LE RISORSE BIOLOGICHE E LE BIOTECNOLOGIE MARINE

Institute for Marine Biological Resources and Biotechnology (IRBIM)

OFFICES: MESSINA, ANCONA, LESINA (FG), MAZARA DEL VALLO (TP)

THE INSTITUTE IN NUMBERS

183 STAFF UNITS

24 LABS & FACILITIES

- Laboratory of Fisheries biology
- Laboratory of Microbial ecology and marine microbiology
- Laboratory of Sustainable aquaculture

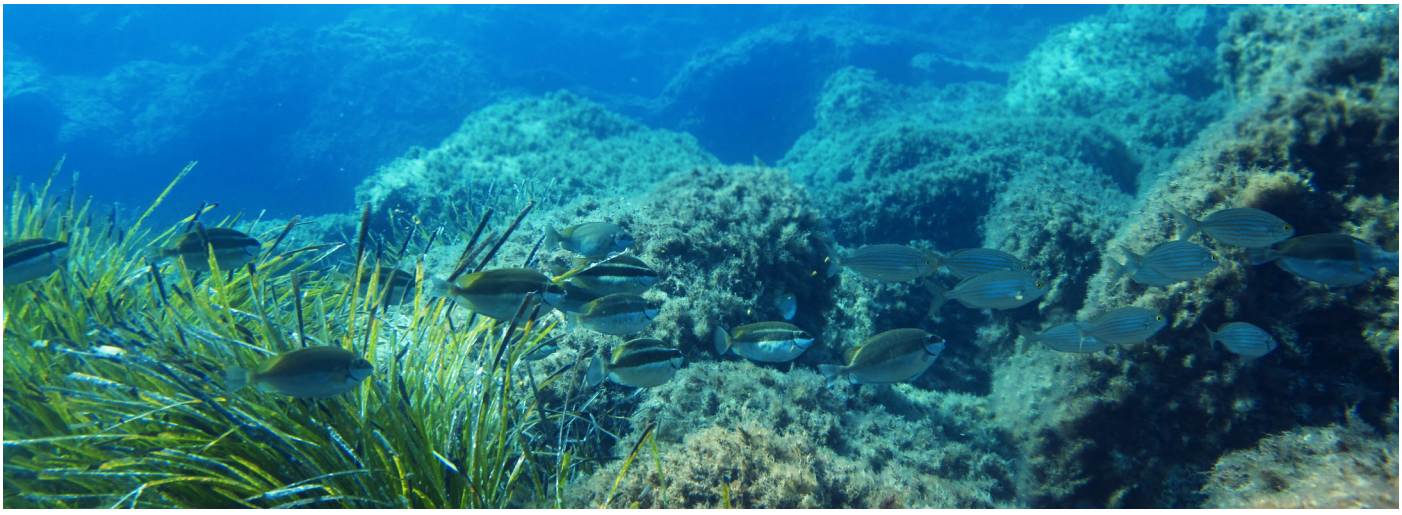
FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

IRBIM CNR's mission is to advance scientific and technological research on marine biodiversity, resources, ecosystems, and blue biotechnologies, and to disseminate knowledge to foster scientific and cultural progress. Research outcomes also support national and EU policies, promoting innovation, sustainability, and competitiveness in fisheries, aquaculture, and marine biotechnology sectors.

IRBIM integrates multiple disciplines and technologies, engages talented researchers, manages its facilities openly, and develops research projects through participation in competitive national and international calls, collaborating with major Italian and foreign research centers. It promotes innovation, technology transfer, and the creation of start-ups and spin-offs (e.g., Athena Green Solutions) and joint laboratories.

IRBIM promotes and participates in the Fano Marine Center, a joint research lab for the study of biodiversity, marine resources, and blue biotechnologies, established by the University of Bologna, University of Urbino, Marche Polytechnic University, Stazione Zoologica Anton Dohrn, CNR IRBIM, and the Municipality of Fano. FMC is a national and international hub of excellence for integrated and multidisciplinary research supporting the blue economy in the Mediterranean. IRBIM fosters numerous collaborations with universities and research centers, also through mobility programs for students and researchers (e.g., "IRBIM CNR International Mobility Call").

It promotes freedom and independence of science, dignity, equity, and the recognition of merit and competence to create a favorable research environment.



Research Institute on Terrestrial Ecosystems (IRET)

The Research Institute on Terrestrial Ecosystems of the National Research Council of Italy (CNR-IRET) was established in 2018 merging two previous CNR institutes, the Institute of Agroenvironmental and Forest Biology (IBAF) and part of the Institute for the Study of Ecosystems (ISE).

With its seven branches, the Institute is involved in research, both basic and applied, on the study of structure, functioning and productivity of terrestrial ecosystems, biotic and abiotic components and their interactions, with a specific focus on global change and anthropogenic pressure.

Special attention is paid to the different levels of biome organization, function, metabolism and evolution, as well as ecosystem services and their implications for environmental quality and human health. The analysis that stresses resulting from climate and land use changes, pollution, and increasing urbanization have on biodiversity and soils forms the basis for the study of adaptations and mitigation strategies, including socioeconomic ones.

The primary objectives of IRET are the study, protection, management and enhancement of natural resources, biodiversity and land, with a view to their sustainable use that moves toward the increasing affirmation of the bio-economy and circular economy, exploiting enabling technologies and "nature based solutions."

The Institute operates on ten research lines: Biodiversity, Ecological Processes, Plant Sciences, Soil Health, Conservation, Sustainable Management, Climate Change, Contamination of Ecosystems, Circular Economy, Environment and Health.

OFFICES: PORANO (TR); PISA; SESTO FIORENTINO; MONTELIBRETTI; NAPOLI; SASSARI; LECCE

THE INSTITUTE IN NUMBERS

238 STAFF UNITS

110 LABS & FACILITIES

Genetics and Genomics;

Mass Spectrometry;

Gascromatography

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

Water research institute (IRSA)

The Water Research Institute (CNR-IRSA) was established in 1968 with the aim of carrying out research activities in the fields of management and protection of water resources and in the development of methodologies and technologies for water purification and treatment of urban and industrial wastewater.

Through a multidisciplinary approach, CNR-IRSA is engaged in research activities on several thematic fields. The main research lines developed by CNR-IRSA are:

- integrated and sustainable management of water and biological resources and development of methods and models for assessing the effects of anthropogenic pressures on the environment
- study of the biodiversity and functionality of aquatic ecosystems through the analysis of ecological and biochemical interactions between biotic and abiotic components
- development of technologies for water purification, for the reuse of civil and industrial wastewater and sludge management
- deployment of advanced processes for resources and energy recovery from the treatment of wastewater, sludge, waste, biomass towards circular economy
- implementation of innovative technologies for the characterization, safety and (bio)remediation of contaminated sites and environments

HEADQUARTER:
MONTELIBRETTI (ARRM1)

SECONDARY OFFICES: BARI; BRUGHERIO; VERBANIA; TARANTO

THE INSTITUTE IN NUMBERS

257 STAFF UNITS

34 LABS & FACILITIES

Chemistry, Biochemistry, Microbiology and Environmental Biology Laboratories

Ecology and Ecotoxicology Laboratories

Hydrogeology and Paleolimnology Laboratories

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

Research institute for geo-hydrological protection (IRPI)

HEADQUARTER: PERUGIA

SECONDARY OFFICES: TORINO, PADOVA, RENDE (CS) E BARI

THE INSTITUTE IN NUMBERS

147 STAFF UNITS

32 LABS & FACILITIES

PhotoGeoLab – Laboratory of Cartography and Photogeology

High-Altitude Open-Air Laboratories

Geotechnics and Geomechanics Laboratory

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

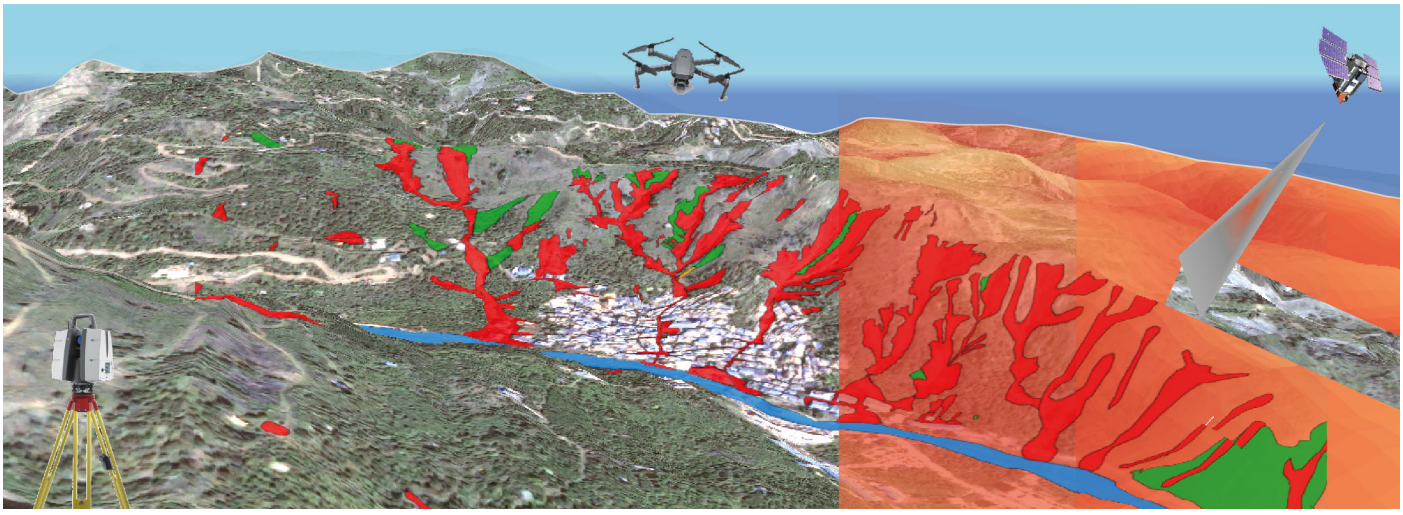
The mission of the Research Institute for Hydrogeological Protection (IRPI) is to conduct scientific research and technological development in the field of natural hazards, with a particular focus on geo-hydrological risks. The aim is to contribute to the protection of the environment and territory, promoting the sustainable use of geo-resources.

The Institute operates at various temporal and geographical scales, and in diverse climatic, physiographic, and geological contexts. Its main objectives include:

- Producing new knowledge on natural hazard and processes, to better understand interactions between the natural and human environment;
- Developing technologies, services, and products for geo-hydrological risk forecasting, mitigation, and management;
- Providing scientific and technical consulting in the field of geosciences;
- Disseminating information and knowledge on natural hazards;

IRPI's activities include the development of monitoring and early warning systems, based on the integrated use of ground-based and satellite observation technologies. The main processes investigated involve landslides, floods, and droughts. The Institute has developed early warning systems for rainfall-induced landslides and flood forecasting, as well as tools for sustainable water resource management. A key role is played by the production of landslide and flood maps, using techniques that range from historical data analysis to remote sensing.

In terms of communication and outreach, IRPI manages websites and social media channels addressed to the public, aiming to promote scientific knowledge and raise awareness of geo-hydrological risks and their potential impacts on society.



Institute of Atmospheric Sciences and Climate (ISAC)

ISAC promotes and develops an integrated scientific understanding of the atmosphere, ocean and their processes through a multidisciplinary approach combining scientific and technological capabilities in meteorology, climatology, atmospheric dynamics, chemical composition and Earth observation.

It carries out theoretical, experimental and modelling research, and impact assessments, exploiting the results through technology transfer and innovation and collaboration with public bodies, industrial partners and in particular with PROAMBIENTE - Tecnopolo Bologna CNR.

Research activities are divided into three macro areas:

- CAMEO – Climate and meteorology, modelling and Earth observation studies climate change, atmospheric variability and extreme weather phenomena through advanced observations, including satellite, and multi-scale modelling
- IMPEACH - Impacts on environment, cultural heritage and human health, addresses natural and anthropogenic risks with an integrated and multidisciplinary approach, across the research areas
- CAFCA - Atmospheric composition, climate forcing and air quality, analyses aerosol and greenhouse gases, develops air quality models and participates in satellite missions and global observations

In 2024, Working Groups were launched to explore emerging and cross-cutting topics like extreme events, fires, machine learning, mountain areas, Earth system dynamics, remote sensing, urband areas, and science & society.

OFFICES: BOLOGNA, CAGLIARI, LAMEZIA TERME, LECCE, PADOVA, ROMA, TORINO

THE INSTITUTE IN NUMBERS

225 STAFF UNITS

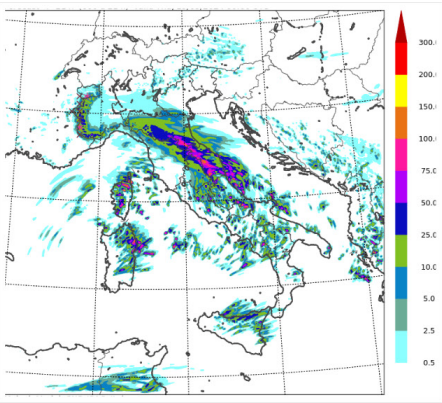
14 LABS & FACILITIES

7 permanent observatories (including 1 Global station and 3 Regional Stations of the GAW program of the WMO and 2 atmospheric research Supersites);

5 remote stations (Arctic Dirigibile Italia, Antarctica "Concordia" and "Mario Zucchelli", Himalaya - Climate observatory at Pyramid, Testa Grigia - Plateau Rosà);

2 mobile laboratories

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE



Marine science institute (ISMAR)

OFFICES: VENEZIA, TRIESTE, BOLOGNA, LERICI, ROMA, NAPOLI, FIRENZE, PALERMO (COSTITUITA NEL 2025), MILANO (SDL)

THE INSTITUTE IN NUMBERS

373 STAFF UNITS

28 LABS & FACILITIES

14 Sea Laboratories,

13 RIs partecipated (among which DANUBIUS-RI marini "the pan-European research infrastructure for studying river–sea systems" and JERICO "European infrastructure for integrated coastal observation",

1 offshore oceanographic tower "Piattaforma Oceanografica Acqua Alta"

The Institute of Marine Sciences (ISMAR) of the National Research Council conducts scientific and technological research on the physical, chemical, biological, and geological processes that govern marine and coastal environments, with particular focus on the Mediterranean and the global oceans.

The Institute's mission is to advance knowledge of marine environments and ecosystems to support the sustainable management of natural and abiotic resources, develop innovative technologies for environmental monitoring and protection, and contribute to the formulation of national and international policies for ocean and coastal protection.

Strategic objectives include conserving biodiversity, studying climate change and its effects, assessing natural and human-induced risks, and strengthening research infrastructures for the collection and management of marine data, both from in situ and remote observation, including extensive expertise in satellite-based exploration.

ISMAR's activities include multidisciplinary research projects, collaborations with public and private institutions, participation in European and international initiatives, development of ocean forecasting models, environmental monitoring and studies on anthropogenic impacts, seafloor and habitat mapping, paleoceanographic research, and technology transfer initiatives for businesses and society.

FOR MORE INFORMATION
VISIT THE INSTITUTE WEBSITE

Institute of Polar Sciences (ISP)

The Institute of Polar Sciences (ISP) promotes excellence in Italian scientific and technological research in polar regions, contributing to the study of the cryosphere, atmosphere, hydrosphere, and biosphere. Its activities address key issues such as climate change, paleoenvironmental reconstruction, environmental contamination, and the relationship between environment and health in extreme conditions. ISP supports national and European environmental policies and fosters the development of new technologies, research methodologies and capacity building.

ISP is a scientific and technical reference point in several key areas:

- **For polar research**, in collaboration with universities and public and private institutions at national and international levels, playing a central role in the National Antarctic Research Program, the Arctic Research Program, and European initiatives through long-term monitoring and cutting-edge scientific research.
- **For science communication**, through high-impact publications and outreach activities that make scientific knowledge accessible to all, encouraging dialogue between experts, institutions, and society.
- **For the standardization of measurements and methods**, promoting quality, coordination, and consistency in research efforts aligned with shared scientific goals.
- **For training** new generations of researchers through thesis work, doctoral research, and collaboration with universities and international institutions.
- **In science diplomacy**, reinforcing Italy's role and presence in multilateral decision-making processes concerning polar regions.
- **For fostering integrated approaches** between natural and social sciences on issues such as sustainability, ethics, and the socio-environmental impacts of change in the polar environments.

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SECONDARY OFFICES: BOLOGNA; ROMA – MONTELIBRETTI; MESSINA

THE INSTITUTE IN NUMBERS

87 STAFF UNITS

10 LABS & FACILITIES

Arctic Station "Dirigibile Italia" with the Amundsen-Nobile Climate Change Tower (CCT) and Gruvebadet observatories

High-altitude Col Margherita observatory

Mooring in Kongsfjorden (Svalbard, Norway) and the Adriatic Sea

FOR MORE INFORMATION
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credits

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