

ENVRI community Studying the environment today to solve the challenges of tomorrow **The Earth is our lab**



What is ENVRI community?

ENVRI community is a collaborative platform for Environmental and Earth system Research Infrastructures helping to transcend the well-established and familiar boundaries of disciplines and domains and to work towards a common holistic understanding of the environment as one system.

It is a platform where the research infrastructures can work together, to share the knowledge and to develop common solutions at all stages of their development. This, on the other hand, ensures their interoperability, avoids unnecessary costs and duplication of the efforts.

What are the research infrastructures?

Research infrastructures are facilities, resources or services of a unique nature that have been identified by research communities to conduct top level activities in their fields. They differ from other research facilities by their long-term sustainability, focus on providing the services, and ability to gather the critical mass of people, knowledge and funds.

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This coloring book introduces research infrastructures and projects that are part of the ENVRI community (envri.eu). They operate within the different domains of Earth system (Atmosphere, Hydrosphere, Biodiversity/Ecosystem and Solid Earth) with some of them having multi-domain approach. Some of them are currently working together in EU funded project ENVRI-FAIR.

Grab a pencil – Color – Learn

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MULTI-DOMAIN

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Key words – Marine bioresources, marine ecosystems, blue biotechnologies Type of Research Infrastructure – Distributed Website – www.embrc.eu

EMBRC – The European Marine Biological Resource Centre is a distributed European Research Infrastructure in implementation phase. EMBRC is based on national nodes located in marine research stations and science institutes in European member states and associated countries.

The main objective of EMBRC is to develop a strategic delivery mechanism for the provision of excellent and large-scale marine science in Europe. EMBRC will establish a European portal to a comprehensive range of marine coastal ecosystems and marine biological resources including established and novel marine model organisms for research purposes. EMBRC will provide access to state-of-the-art research facilities, equipment and streamlined services for users.



Key words – Seafloor, water column, multidisciplinary across domains, long-term monitoring, ERIC

Type of Research Infrastructure – Single RI with multiple sites Website – www.emso-eu.org

EMSO – The European Multidisciplinary Seafloor and Water-Column Observatory is a large-scale European Research Infrastructure Consortium (ERIC) of fixed point, deep sea and water-column observatories. The power of EMSO ERIC is in its distributed nature, presently composed of eleven deep ocean observatories and four shallow water test sites connecting research facilities across the oceans of Europe, from the Arctic through the North Atlantic to the Mediterranean and the Black Sea.

EMSO provides pan-European power, communications, sensors, and data infrastructure for continuous, high resolution, near real-time, coordinated interactive ocean observations across a truly multi- and interdisciplinary range of research areas including biology, geology, chemistry, physics, engineering, and computer science; from polar to tropical environments, down to the abyss.



Key words – Greenhouse gas observations, carbon cycle, standardized measurements, data integration, ERIC Type of Research Infrastructure – Distributed Website – www.icos-ri.eu

Integrated Carbon Observation System (**ICOS**) is a pan-European environmental research infrastructure which provides harmonised and high-precision scientific data on carbon cycle and greenhouse gas budget and perturbations. ICOS RI integrates atmosphere, ecosystem and ocean greenhouse gas observational networks in order to provide the data for a full European carbon balance and its trends. Standardized measurements are carried out throughout Europe – at tall atmospheric towers and ecosystem sites from the Artic to the Mediterranean, as well as on ocean platforms and vessels covering the North Atlantic, the Mediterranean Sea and the Baltic Sea.

In addition to a European-wide research infrastructure, ICOS RI coordination activities ensure that the measurements are processed into a single and coherent data set which is easily available to the researchers and all the interested social stakeholders such as citizens, decision makers and media.



Key words – Modelling, climate change, climate variability, Earth system, HPC Type of Research Infrastructure – Virtual (e-infrastructure) Website – is.enes.org

IS-ENES2 is the second phase of the I3 infrastructure project for the European Network for Earth System Modelling (ENES). ENES gathers the community working on climate modeling. It contributes to the WCRP international coordinated experiments, used in support of the IPCC assessments. IS-ENES encompasses climate models and their environment tools, model data and the interface of the climate modeling community with high-performance computing, in particular the European RI PRACE. IS-ENES provides services on models and software tools.

It contributes to the international WCRP modelling database (ESGF), to the development of international standards on data and metadata (ES-DOC), and grants access to model data and metadata for the international global (CMIP) and regional (CORDEX) climate modelling experiments. IS-ENES aims to further integrate the community, foster the development of Earth system models, facilitate high-end experiments and ensure the dissemination of model results for a large user community, including impact studies and climate service providers.





Key words – Svalbard, Arctic, observational network, polar research Type of Research Infrastructure – Regional/Distributed Website – www.sios-svalbard.org

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The Svalbard Integrated Earth Observing System (**SIOS**) will be a regional observing system for long-term measurements in and around Svalbard. It will coordinate and develop existing and new research infrastructure in Svalbard, and will set an example for how to systematically construct observational networks in the Arctic.

The joint services offered by SIOS will generate added value for all partners beyond what their individual research can provide. The services will benefit the international polar research community as a whole and will make SIOS the leading polar research infrastructure in the Arctic.

ATMOSPHERIC DOMAIN



Key words – Atmospheric aerosols, clouds, trace gases, air quality, climate change Type of Research Infrastructure – Distributed Website – www.actris.eu

ACTRIS is a European Research Infrastructure dedicated to high-quality observation of aerosols, clouds, and trace gases and the exploration of their interactions. Detecting changes and trends in atmospheric composition and understanding their impact on the stratosphere and upper troposphere is necessary for establishing the scientific links and feedback between climate change and atmospheric composition.

ACTRIS delivers high-precision data, services and procedures regarding the 4D variability of clouds, shortlived atmospheric species and the physical, optical and chemical properties of aerosols to improve the current capacity to analyse, understand and predict past, current and future evolution of the atmospheric environment. ACTRIS is composed of observing stations, exploratory platforms, instrument calibration centres, and a data portal. ACTRIS serves a vast community of users and has the essential role to support building of new knowledge as well as policy issues on climate change, air quality, and long-range transport of pollutants.



Key words – Radar observations, incoherent scatter technique, atmosphere, near-Earth space Type of Research Infrastructure – Single RI with multiple sites Website – www.eiscat3d.se

EISCAT_3D – is a multi-static phased array radar system dedicated to observations of the Earth's polar atmosphere above the northern Scandinavian Peninsula, as well as for support of the solar system and radio astronomy sciences. The system is designed to investigate how the Earth's atmosphere is coupled to space but it will also be suitable for a wide range of other scientific targets.

The project is run by EISCAT Scientific Association, an existing international research infrastructure that is currently funded and operated by research councils and funding organizations in Norway, Sweden, Finland, Japan, China and the United Kingdom and has its headquarters in Kiruna, Sweden. The ESFRI selected EIS-CAT_3D for inclusion in the Roadmap 2008 for Large-Scale European Research Infrastructures.



Key words – Atmospheric composition, commercial aircraft, aerosols, clouds Type of Research Infrastructure – Distributed Website – www.iagos.org

IAGOS is a European research infrastructure which implements and operates a global observation system for atmospheric composition by deploying autonomous instruments aboard a fleet of commercial passenger aircraft. The European consortium behind IAGOS includes research centres, universities, national weather services, airline operators and aviation industry. IAGOS provides freely accessible data for users in science and policy including air quality forecasting, verification of CO² emissions and Kyoto monitoring, numerical weather prediction, and validation of satellite products.

It is considered a major contributor to the in-situ component of Copernicus Atmosphere Monitoring Services (CAMS). In combination with its predecessor programs MOZAIC and CARIBIC, which it has now incorporated, IAGOS has provided long-term observational data of atmospheric chemical composition in the troposphere and lower stratosphere since 1994, which it has expanded with new IAGOS-CORE aircraft the first of which was equipped in 2011, and the 10th one in 2017.



MARINE DOMAIN

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Key words – Seafloor, deep sea observations, integration, staff exchange, joint experiments Type of Research Infrastructure – Distributed Website – visobservatories.webs.com

ESONET-VI is a consortium focusing on deep-sea observatories built upon European Seafloor Observatory NETwork activities, in complement to the EMSO observatories infrastructures. The consortium aims at defining a perennial integration at European level of scientists from numerous laboratories using data collected by deep sea observatories.

ESONET-Vi organizes exchange of personal between its members; joined experiments on EMSO observatories, and workshops on data exploitation, management and dissemination, new sensor technologies, inter-comparison of results as well as promotes development of new scientific packages on the existing observatories. ESONET-Vi allows linking geographically scattered complementary research, industrial and governmental elements in Europe to rapidly transfer and implement research results into science and industrial applications.



Key words – Ocean observing system, float deployment, global array Type of Research Infrastructure – Distributed, ERIC Website – www.euro-argo.eu

Euro-Argo is the European contribution to the international program Argo, a network of almost 4000 autonomous profiling floats drifting all over the world ocean and taking measurements of temperature and salinity from the sea surface up to 2000m depth. The objectives of Euro-Argo are to optimize, sustain and improve the European contribution to Argo and to provide a world-class service to the research (ocean and climate) and operational oceanography (Copernicus Marine Service) communities.

Euro-Argo also aims at implementing the new phase of Argo with an extension to greater depths, biogeochemical measurements and observations of the polar regions. Euro-Argo, which gained the European legal status of an ERIC in May 2014, aims at developing a capacity to maintain one fourth of the network and ensure that all data are processed and delivered to users.



Key words – Research vessels and equipment, transnational access, joint research activities, research fleets, training Type of Research Infrastructure – Distributed Website – www.eurofleets.eu

EUROFLEETS2 is the enhancement of EUROFLEETS with the aim of developing a pan-European distributed research fleet infrastructure with common strategic vision and coordinated access to European marine Research Vessels and marine equipment. EUROFLEETS2 provides fully funded days of ship-time on board 8 Global/ Ocean class and 14 Regional class Research Vessels.

EUROFLEETS2 also offers access to large equipment such as ROVs and submersibles to carry out ship-based research activities within various fields of marine sciences. EUROFLEETS2 promotes information sharing, identification of new collaborative frameworks, development of common software tools and innovative integration schemes. The project contributes as well to the training of young marine scientists through dedicated shipbased training courses.



Key words – Oceanography, network, regional sea areas Type of Research Infrastructure – Distributed Website – www.eurogoos.eu

EuroGOOS, the European Global Ocean Observing System, is an International Non-Profit Association of governmental agencies and research organisations, established in 1994 within the context of the IOC's Global Ocean Observing System. Today, EuroGOOS has 40 members from 19 European countries providing operational oceanographic services and carrying out marine research. EuroGOOS coordinates six regional operational systems: the Arctic ROOS, BOOS (the Baltic), NOOS (the North West Shelf), IBI-ROOS (the Ireland-Biscay-Iberian area) and MONGOOS (the Mediterranean). Strong regional cooperation enables the involvement of many more partners and countries.

Through its ROOSes, working groups and networks of marine operational platforms, EuroGOOS delivers strategies, priorities and standards, towards an integrated European Ocean Observing System, to underpin sustainable blue growth.





Key words – Coastal observations, pan-European framework, marine research Type of Research Infrastructure – Distributed Website – www.jerico-ri.eu

JERICO-NEXT – Coastal observations are an important part of the marine research. However significant heterogeneity still exists in Europe concerning technological design of observing systems, measured parameters, practices for maintenance and quality control, as well as quality standards for sensors and data exchange. The main challenge for the research community is to increase the coherence and the sustainability of these dispersed infrastructures by addressing their future within a, shared pan-European framework. In the continuity of JERICO(FP7), the objective of JERICO-NEXT consists in strengthening and enlarging a solid and transparent European network, integrating key observing platforms as well as developing further the collection of biological data, in particular exploiting synergies with marine biological observatories.

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JERICO-Next intends to contribute to the international and global effort on climate change research (GE-OSS), to provide coastal data inputs for operational ocean observing and forecasting, and also to answer to some of the needs of the environmental research and societal communities.



Key words – Ocean, data centers, data management, data access, harmonized data Type of Research Infrastructure – Virtual Website – www.seadatanet.org

SeaDataNet – Pan-European infrastructure for ocean & marine data management - is a standardized system for managing the large and diverse data sets collected by the oceanographic fleets and the automatic observation systems. The SeaDataNet infrastructure links already 90 national oceanographic data centres and marine data centres from 35 countries riparian to all European seas. The data centres manage large sets of marine and ocean data, originating from their own institutes and from other parties in their country, in a variety of data management systems and configurations.

A major objective and challenge in SeaDataNet is to provide an integrated and harmonised overview and access to these data resources, using a distributed network approach. The networking of these professional data centres, in a unique virtual data management system provide integrated data sets of standardized qualities online.

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ECOSYSTEM / BIODIVERSITY

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Key words – Ecosystem, experimental platforms, food security, environmental sustainability Type of Research Infrastructure – Distributed Website – www.anaee.com

AnaEE – Infrastructure for Analysis and Experimentation on Ecosystems – is a Research Infrastructure for experimental manipulation of managed and unmanaged terrestrial and aquatic ecosystems. It will support scientists in their analysis, assessment and forecasting of the impact of climate and other global changes on the services that ecosystems provide to society. AnaEE supports European scientists and policymakers to develop solutions to food security, climate change mitigation, and environmental sustainability, while stimulating the growth of a vibrant bio-economy.

AnaEE's building blocks are open-air and enclosed experimental platforms equipped with the latest technology and sophisticated analytical and modelling platforms coupled to observation sites that will provide the indispensable calibration and validation of datasets throughout Europe. AnaEE is now preparing an ERIC after the end of the preparatory phase on Oct 31, 2016.



Key words – Life science, biological information, living systems Type of Research Infrastructure – Distributed Website – www.elixir-europe.org

ELIXIR – European infrastructure for biological information – unites Europe's leading life science organisations in managing and safeguarding the massive amounts of data being generated every day by publicly funded research. It is a pan-European research infrastructure for biological information.

ELIXIR will provide the facilities necessary for life science researchers – from bench biologists to cheminformaticians – to make the most of our rapidly growing store of information about living systems, which is the foundation on which our understanding of life is built.



Key words – Long-term ecosystem research, socio-ecology,in-situ Type of Research Infrastructure – Distributed in-situ infrastructure Website – www.lter-europe.net

eLTER – Long-Term Ecosystem Research (LTER) is an essential component of worldwide efforts to better understand ecosystems. Through multi-scale research and long-term observation, LTER seeks to improve our knowledge of the structure and functions of ecosystems and their long-term response to environmental, societal and economic drivers. LTER-Europe comprises about 400 LTER sites and socio-ecological research platforms in 25 countries. Since its launch over a decade ago, European LTER research communities have sought to better integrate traditional natural sciences and holistic ecosystem research that includes studies of human-environment interactions and the critical zone in a cross-disciplinary way.

eLTER is currently working to establish the eLTER ESFRI Research Infrastructure, comprising a selection of well-instrumented long-term research sites in key European ecosystems. A Head Office and Topic Centres will deliver central services for researchers, policymakers, students, authorities and civil society, including access to data, sites, analysis tools, expertise, training and education.



Key words – Arctic, network, terrestrial research, monitoring Type of Research Infrastructure – Distributed Website – www.eu-interact.org

INTERACT is a network of research stations, providing a platform for research and monitoring in the Arctic and northern alpine and forest areas, and building capacity for identifying, understanding, predicting and responding to climate and environmental changes. The network of more than 75 terrestrial research stations hosts and operates high level scientific activities over a wide range of disciplines, and new stations continue to join the network.

INTERACT cooperates with regional and global organisations and programmes to facilitate implementation of science agendas and develop standards for science and data management at participating stations. Scientists and other stakeholders are welcome to all participating stations. The INTERACT Transnational Access programme supports scientists to conduct state-of-the-art research and altogether 43 stations offer Transnational Access in 2016–2020.



SOLID EARTH

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Key words – Plate observations, solid Earth, earthquakes, volcanoes, tsunamis, tectonics, Earth surface Type of Research Infrastructure – Distributed Website – www.epos-ip.org

EPOS – The European Plate Observing System is a long-term plan to foster scientific, technological, and ICT innovation for successfully addressing global challenges in Earth science. EPOS brings together 25 European nations and combines about 300 national solid Earth science infrastructures across different fields and disciplines, and their associated data and services together with the scientific expertise into one integrated delivery system for the solid Earth.

During the EPOS implementation phase (2015–2019), two key outcomes will be achieved: (i) the implementation of the community and integrated services, Thematic Core Services (TCS) and Integrated Core Services (ICS); (ii) the legal establishment of the EPOS European Research Infrastructure Consortium (ERIC). The next EPOS e-infrastructure will allow the Earth Science community to make a significant step forward by developing new concepts and tools for accurate, durable, and sustainable answers to societal questions concerning geo-hazards and those geodynamic phenomena (including geo-resources) relevant to the environment and human welfare.

ASSOCIATED RESEARCH INFRASTRUCTURES



Key words – Atmospheric dynamics, atmospheric waves, middle and upper atmosphere, extreme events, weather and climate models Type of Research Infrastructure – Distributed Website – arise-project.eu

ARISE – The middle atmosphere which integrates the stratosphere and mesosphere is a crucial region strongly disturbed by the propagation and breaking of planetary and gravity waves which mainly originate in the lower atmosphere and impact the atmospheric circulation at global scale. The ARISE platform integrates different station networks including the infrasound network developed for the verification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) completed by a large set of European infrasound stations, the Network for the Detection of Atmospheric Composition Changes (NDACC) providing Lidar dynamics measurements, complementary Mesosphere-Stratosphere-Troposphere (MST) and meteor radars, wind radiometers, ionospheric sounders and satellites.

The role of ARISE is to provide high quality observations and modeling, needed to recover the vertical structure of the atmospheric disturbances over broad spatial and temporal scales. Applications focus on weather and climate forecasting, remote monitoring of extreme events such as volcanoes, meteors, and other weather related disturbances.



Key words – Airborne research, in situ measurements, atmospheric measurements, remote sensing instruments, research aircraft Type of Research Structure – Distributed Website: www.eufar.net

EUFAR – is a network and a portal dedicated to airborne research for the environment and geosciences in Europe. In essence, EUFAR seeks to cater to the needs of researchers at different stages of their career by granting them access to aircraft and instrumentation, providing technical support and training opportunities, developing freely accessible tools, harmonising research practices, and disseminating expertise and information on research activities for the benefit of the science community and industry development.

From in situ measurement of atmospheric properties to remote sensing, the high manoeuvrability of instrumented aircraft allows researchers to pursue atmospheric physical and chemical phenomena and to study the properties of land and water surfaces. This is especially useful in remote locations, to study the evolution of these processes and properties and to span from small spatial scales up to thousands of kilometres.



ASSOCIATED RESEARCH INFRASTRUCTURES

EUROCHAMP-2020 – Atmospheric simulation chambers are the most advanced tools for elucidating processes that occur in the atmosphere. They lay the foundations for air quality and climate models and also aid interpretation of field measurements. EUROCHAMP-2020 aims at further integrating the most advanced European atmospheric simulation chambers into a world-class infrastructure for research and innovation. A coordinated set of networking activities deliver improved chamber operability across the infrastructure, as

Website – www.eurochamp.org

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EUROCHAMP 2020 Key words – Atmospheric chemistry, simulation chambers, calibration centres, climate studies, air quality experiments, collaboration with industry. Type of Research Infrastructure – Distributed



Key words – Scientific ballooning, Atmosphere, balloon-borne platforms Type of Research Infrastructure – Distributed Website – https://www.hemera-h2020.eu/

HEMERA is a Research Infrastructure funded by the Horizon 2020 framework Programme of the European Union which integrates a large starting community in the field of tropospheric and stratospheric balloon-borne research, to make existing balloon facilities available to all scientific teams in the European Union, Canada and associated countries. The complementary of the HEMERA members' capabilities in the field of balloon systems and operations will offer an easy and enhanced service to the scientific community. A wide range of scientific and technical themes are addressed, such as astronomy, atmospheric physics and chemistry, climate research, fundamental physics, biology, space research and technology.

HEMERA provides Trans-National Access to balloon flights and scientific data acquired through balloon flights, strengthens and enlarges the user community and improves ballooning technology and scientific instrumentation.



Key words - Freshwater and marine ecosystem scale experimental mesocosms & enclosures, transnational access, joint research, training Type of Research Infrastructure - Distributed Website - www.aquacosm.eu

AQUACOSM – a European network of advanced mesocosms for experiments on aquatic ecosystems in all types of waters, from mountain streams to lakes, brackish estuaries and salty oceans. It has more than 37 mesocosm facilities, 21 partners in 12 countries from the Arctic to the Mediterranean. The network contains the only open ocean facility in the world (KOSMOS at GEOMAR in Kiel, DE), the largest highly replicated freshwater mesocosms (IGB-LakeLab in Lake Stechlin, DE), the longest running freshwater mesocosm experiment (at Aarhus Univ., Silkeborg, DK), and the world's oldest still running marine mesocosm facility (Espegrend, Univ. of Bergen, NO). Espegrend have offered "Transnational Access" (TA) to international experiments since its start in 1978, long before it was called so. AQUACOSM is the first specialised mesocosm network on all aquatic environments, and builds on the successful marine FP7 MESOAQUA network. By the end of 2020 they will have offered more than 15 000 TA user days.



International Centre for Advanced Studies on River-Sea Systems Key words – River-sea system, marine, freshwater, interdisciplinary, observation, analysis, modelling, impact Type of Research Infrastructure – Distributed

DANUBIUS-RI – which is currently in its preparatory phase, is the International Centre for Advanced Studies on River-Sea Systems, a pan-European distributed research infrastructure dedicated to interdisciplinary studies of river-sea systems. It will support research addressing the conflicts between society's demands, environmental change and environmental protection in river-sea systems worldwide. It will fill the gap of fragmented research on European research, drawing on existing research excellence across Europe and enhancing the impact of European research while maximising the return on investment. It will provide access to a range of European river-sea systems, facilities and expertise; a 'one-stop shop' for knowledge exchange in managing river-sea systems; access to harmonised data; and a platform for interdisciplinary research, inspiration, education and training.





Key words – Natural science collections, open data Type of Research Infrastructure – Distributed Website – www.cetaf.org / www.dissco.eu

CETAF – The Consortium of European Taxonomic Facilities (CETAF) is a unique association of reference institutions housing natural science collections in Europe, that provide essential data and crucial groundwork for the biological and geosciences. CETAF is the largest distributed collections-based platform in Europe and operates as a stronghold and as a wide network for taxonomic research and systematic biology.

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DiSSCo – Bringing natural sciences collections together across Europe, and building on top of CETAF's community, DiSSCo – Distributed System of Scientific Collections – aims to bring the collections to the information age by creating an integrated data-driven research infrastructure that will underpin the entire research lifecycle and provide access to mass, linked, reliable and precise data to the natural world. The precision and accuracy with which DiSSCo can deliver taxonomic, bio-geographical and species trait data is of vital importance for tackling the great societal challenges of our time.



Key words – Biodiversity, Ecosystem Research, ICT services, Computing, Big Data, Open Data, Open Science, Cloud, Training Type of Research Infrastructure – Virtual Website – https://www.lifewatch.eu/

Lifewatch-ERIC – is the European Infrastructure supplying e-Science research facilities for scientists seeking to increase our knowledge and deepen our understanding of Biodiversity organisation and Ecosystem functions and services, with the goal of supporting civil society in addressing the key planetary challenges. Life-Watch-ERIC has been designed to tackle many of the constraints affecting researchers' daily activities and their pressing need for increasingly diverse data and larger and more advanced models, open data and open science, making it possible to explore the new frontiers of the ecological domain, and providing unprecedented opportunities to perform faster, cutting-edge collaborative activities for biodiversity and ecosystem research.

LifeWatch provides the infrastructure, services and computing power to manage the immense amount of data coming from European and global repositories, observatories, sensors and from the whole scientific community, making them available to researchers, decision-makers and citizens, as a structural tool for the Open Research Area.



Key words – Plant Phenotyping, Plant performance, Climate change, Food Security Type of Research Infrastructure – Distributed Website –emphasis.plant-phenotyping.eu

EMPHASIS – A growing world population, climate change and the limitation of natural resources (like water) demand for a significant increase in quantity and quality of plant biomass production as basis for food production. One response is to analyse genotype performance under diverse environmental conditions and quantify the diversity of traits contributing to performance in these diverse environmental scenarios such as plant structure and architecture, major physiological functions and output, yield and its components and quality.

This requires the use of different categories of installations in field and platforms, connected to an e-infrastructure enabling the re-usability of plant phenotyping and genetic data according to FAIR principles. For this purpose, the European Infrastructure for Multi-scale Plant Phenomics and Simulation (EMPHASIS) aims at developing an integrated pan-European infrastructure of instrumented phenotyping facilities available to the user community and able to quantitatively test plant performance under current and future agro-climatic scenarios. After finalising its preparatory phase intended to develop a strategy for implementation and sustainable operation, EMPHASIS aims at starting full operation of its services in 2021, including access to different categories of phenotyping infrastructures such as controlled conditions, intensive field, network of field experiments, modelling and e-infrastructures.



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