EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

http://www.cost.eu/essem

What is ESSEM?

Earth System Science and Environmental Management

ESSEM encompasses the rapidly-growing science and technology agendas to better understand, observe, model and predict the Earth system and improve the management of environmental conditions.

In Detail

The following examples illustrate actual research within this Domain. The scope of the Domain is not restricted to these activities.

- **Modelling and observing of Earth systems**: based on improving our understanding of physical and biogeochemical principles through new and integrated observing and modelling capacities, this will help predict global and regional environmental changes.
- **Prediction and mitigation of hydro-meteorological and other hazards**: This will require developing advanced modelling and warning systems integrated with upgraded in-situ, remote sensing and satellite technologies and observing networks.
- **The Environmental Management** aspects will include strong emphasis on science and technology related to managing natural resources and minimising environmental degradation.

Strong interactions with international initiatives, programmes or organisations would be welcome. ESSEM is likely to have strong links with other COST Domains addressing issues where there is a strong interaction between human activities, the Earth system and environmental conditions.

ESSEM will enlarge the scope of the former 'Environment' and 'Meteorology' Domains. It will emphasise science and technology activities related to observing, modelling and predicting Earth System changes and severe hazards, by integrating various monitoring techniques and networks, and by improving natural resource management for minimising environmental degradation.

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COST strives for a bottom-up approach to science networking.
For more information, visit www.cost.eu

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Current COST Actions within the ESSEM Domain:

- ES0701 Improved Constraints on Models of Glacial Isostatic Adjustment
- ES0702 European Ground-Based Observations of Essential Variables for Climate and Operational Meteorology (EG-CLIMET)
- ES0801 The Ocean Chemistry of Bioactive Trace Elements and Paleoclimate Proxies
- ES0802 Unmanned Aerial Systems (UAS) in Atmospheric Research
- ES0803 Developing Space Weather Products and Services in Europe
- ES0804 Advancing the Integrated Monitoring of Trace Gas Exchange between Biosphere and Atmosphere
- ES0805 The Terrestrial Biosphere in the Earth System
- ES0806 Stable Isotopes in Biosphere-Atmosphere-Earth System Research (SIBAE)
- ES0901 European Procedures for Flood Frequency Estimation (FloodFreq)
- ES0902 Permafrost and Gas Hydrate Related Methane Release in the Arctic and Impact on Climate Change: European Cooperation for Long-term Monitoring: PERGAMON
- ES0903 Spectral Sampling Tools for Vegetation Biophysical Parameters and Flux Measurements in Europe
- ES0904 EGO - European Gliding Observatories Network
- ES0905 Basic Concepts for Convection Parameterization in Weather Forecast and Climate Models
- ES0906 Seagrass Productivity: From Genes to Ecosystem Management
- ES0907 INTIMATE: INTegrating Ice core, MArine and TErrestrial records (60 000 to 8 000 years ago)
- ES1001 SMOS Mission Oceanographic Data Exploitation
- ES1002 Weather Intelligence for Renewable Energies (WIRE)
- ES1003 Development and implementation of a pan-European Marine Biodiversity Observatory System (EMBOS)
- ES1004 European framework for online integrated air quality and meteorology modelling (EuMetChem)
- ES1005 Towards a more complete assessment of the impact of solar variability on the Earth's climate
- ES1006 Evaluation, improvement and guidance for the use of local-scale emergency prediction and response tools for airborne hazards in built environments
- ES1101 Harmonizing Global Biodiversity Modelling (HarmBio)
- ES1102 VALUE – Validating and Integrating Downscaling Methods for Climate Change Research
- ES1103 Microbial ecology & the earth system; collaborating for insight and success with the new generation of sequencing tools
- ES1104 Arid Lands Restoration and Combat of Desertification: Setting Up a Drylands and Desert Restoration Hub
- ES1105 Cyanobacterial blooms and toxins in water resources: Occurrence, impacts and management.
- ES1106 Assessment of EUROpean AGRIculture WATer use and trade under climate change (EURO-AGRIWAT)
- TD0803 Detecting Evolutionary Hot Spots of Antibiotic Resistances in Europe (DARE)
- TD1105 European Network on New Sensing Technologies for Air-Pollution Control and Environmental Sustainability - EuNetAir

Success Stories

COST Action 725 helped participants from 27 countries establish a European reference data set of naturally recurring observations to be used for climatological purposes especially climate monitoring and detection of changes. For the first time, this study has been unique in linking the advances of spring to climate change.

COST Action 724 has effectively helped to put space weather on the map. By creating a European Space Weather Web Portal that links many sources of data and models. It offers multi-lingual outreach pages for the general public and has promoted the topic by organising a European Space Weather Week.

How to join a COST Action

Scientists interested in joining an ongoing COST Action should contact the Action Chair and the COST National Coordinator in their member country (www.cost.eu/cnc).

To propose a new Action, visit: www.cost.eu/opencall. COST assesses new proposals two times a year.

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