

Forward Look Proposal

RESCUE

Responses to Environmental and Societal Challenges for our Unstable Earth

Presented by
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on behalf of
**the Standing Committee for Life, Earth and Environmental Sciences (LESC) and
the Standing Committee for Social Sciences (SCSS)**

to
the European Science Foundation

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¹ This proposed FL was initiated at the request of CNRS, and followed by **Dr. Patrick Monfray** (Deputy Director of INSU-CNRS)

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Executive Summary

Undoubtedly, humankind is currently facing unprecedented changes in the Earth system that have arisen at a rapidly growing rate because of human activities: the unsustainable exploitation and consumption of natural resources and the accelerating perturbation of the environment. The systemic understanding of global change has expanded markedly, but societal drivers and consequences are still to be fully explored through problem-oriented approaches. The extensive knowledge base that scientific research has created, should contribute to the development of sustainable responses to global change. In particular, the complex Earth system requires studies at scales compatible to political and societal agendas. Efforts to integrate results from disciplinary research have had limited success; stronger common foundations between natural, social and human sciences are now needed to establish a really integrated approach from the beginning..

In this context, this Forward Look RESCUE has the overall aims of addressing the societal needs that require understanding of global change, including its human dimensions, and stimulating an appropriate and integrated response from natural, social and human sciences. This overarching objective will be achieved through the following key tasks:

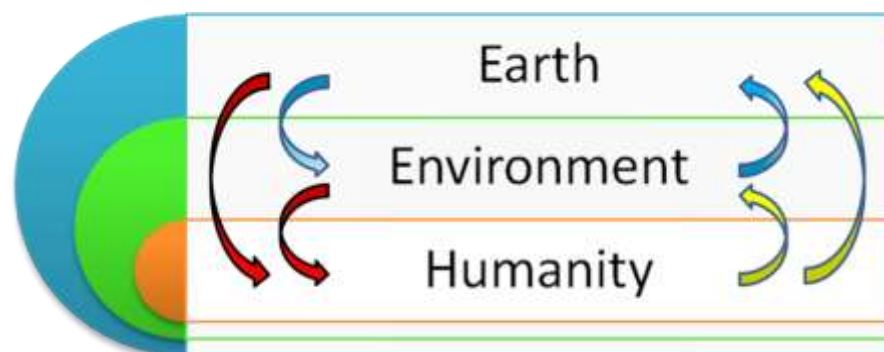
- to propose processes for natural sciences and social and human sciences to improve in a medium to long term timeframe their ability and capacity to work together, in order to respond to the pressing policy and societal needs
- to articulate science questions related to global change and especially those of a trans-disciplinary nature, or of major society-driven relevance
- to explore effective, new approaches towards truly integrated, interdisciplinary science, and to facilitate the “revolution” in education it requires.

The Forward Look proposed by two Standing Committees of ESF – namely LESC and SCSS – will be organised around a series of activities including four Working Groups. These will focus on: *collaboration between the natural, social and human sciences in global change studies; requirements for research methodologies and data; towards a ‘revolution’ in education and capacity building; and interface between science and policy, communication and outreach.* They will actively involve a large variety of actors and stakeholders. Through its analyses and recommendations, this Forward Look will enable the scientific communities, together with key stakeholders including policy makers, to develop medium to long-term strategies for future research activities and applications. It is expected that it will impact society by favouring common strategic understanding and coordination, and through transformative education delivery to ensure optimal impact and value.

Overall, this effort will enable – mainly within existing resources – an increased effectiveness of ongoing and future activities across research organisations and initiatives in Europe.

Introduction and Background

Recent, undisputed evidence shows that humankind is currently facing unprecedented changes in the Earth system because of its own activities, based on intensive exploitation and consumption of natural resources and marked perturbation of natural processes. These changes present new challenges and risks for society, and bring humanity where it has never been before. In this context, the relevant research agendas need to evolve very rapidly, as the scale and urgency of the socio-environmental challenge grows. Indeed, the systemic understanding of global change has expanded markedly, but societal drivers and consequences are still to be fully explored through problem-oriented approaches, and the issues at stake need to be spelt out clearly also for general public understanding. Strategic responses require a full integration of efforts to achieve sustainable governance, through the interdisciplinary contribution of social and human (including medical) sciences in addition to natural (including physical) sciences. There is a crucial need to rethink and adapt the relevant structural scientific and educational landscape in Europe.



Relationships between Humanity, its Environment and the Earth, considered as parts of the Earth System. The blue and yellow arrows respectively represent well and partially studied relationships, while the red arrows stand for the effects of Global change on Humanity that are still to be investigated.

In the global change research community, Earth System Science is the study of the Earth system, with an emphasis on observing, understanding, reconstructing and predicting global environmental changes. It is a highly complex science field in its infancy. The integration of European efforts in this research field is a real challenge on its own, especially when it comes to implementation: e.g., synergy and programming, sharing of resources, education and capacity building. Such efforts have been recognised as being more appropriate to address at the European scale rather than at the national level. The relevant space and time scales in the Earth system processes need to be further studied. For instance, only recently have we begun to appreciate how the Earth responds on long-term human time scales. One has to go beyond decades and centuries and include Earth processes responsible for major geo-hazards. Analogues of long-term and abrupt changes provided by the Earth system are also important tools for calibration and reference. Yet, the complex Earth system also requires studies at scales compatible to political and societal agendas. In this respect, our advanced knowledge-based society in Europe should make it possible to develop adaptive, sustainable governance.

The development of trans-disciplinary approaches, based on an active dialogue with decision-makers and other stakeholders, is not an easy task. This is particularly true in the fragmented landscape of multiple research performing and research funding organisations within Europe. Moreover, trans-disciplinary initiatives are often not adequately evaluated, supported and managed and should be favoured in order to incorporate the state-of-the-art of each discipline. For instance, interdisciplinary science is essential to distinguish between the natural variability of elemental cycles and the anthropogenic perturbations of those cycles as both are part of the Earth system. Similarly, the human responses to global changes are not simple, logical processes, and their studies require integrated contributions from natural sciences (such as geo-engineering or environmental management) and from social and human sciences (such as social anthropology and cognitive science).

Existing activities related to global change

Over the last few decades, many research activities driven by global change issues and policy-relevant platforms have been underway at international level. However no fully integrated effort, especially at the European level, has so far adequately addressed the environmental and societal challenges towards adaptive sustainable governance.

At the international level

The **International Council for Science (ICSU; www.icsu.org)** has recently approved three major initiatives on:

- Hazards [Integrated Research on Disaster Risk],
- Millennium Assessment (MA) follow up [Humans, Ecosystems and Well-being]
- Human health [Health and Well-being in the Changing Urban Environment]

In addition, the ICSU is currently in the process of visioning the future of Earth system/global environmental change research, with the long-term aim a coherent single framework for the four current ICSU-sponsored programmes: World Climate Research Programme (WCRP), International Geosphere-Biosphere Programme (IGBP), International Human Dimensions Programme (IHDP), and International Programme of Biodiversity Science (Diversitas), as well as their umbrella organization, the Earth System Science Partnership (ESSP).

The **International Social Science Council (ISSC; www.unesco.org/ngo/issc)** will soon hold its first World Social Science Forum to focus on:

- The changing world and the challenges it presents to social science
- The interface between social science and the changing world
- The state of social science itself, as it seeks to confront the challenges

The **International Group of Funding Agencies for Global Change Research (IGFA; www.igfagcr.org)** focuses on the coordination of the international research programme support, through an informal working mode, with no binding obligations on its members, which are ministerial bodies or national research agencies. Among them, many are ESF Member Organisations.

The **Earth System Science Partnership (ESSP; www.essp.org)**, a joint initiative of the four international global environmental change research programmes, is currently developing a new strategic plan with the mission to initialise and catalyse integrative studies of Earth system science including the human dimension, to enhance capacity building and to facilitate dialogue between science and society, with particular emphasis on four critical issues (carbon dynamics, food, water and health) in line with the Millennium Development Goals.

The **Intergovernmental Panel on Climate Change (IPCC; www.ipcc.ch)** provides scientific and technical information in a policy-relevant, yet policy-neutral, way. Through its 3 Working Groups dealing with research synthesis on the "Physical Science Basis of Climate Change", "Climate Change Impact, Adaptation and Vulnerability" and the "Mitigation of Climate Change", the IPCC now delivers much of the knowledge base for understanding climate change and the possible mitigation and adaptation strategies.

The **Millennium Ecosystem Assessment (MA; www.millenniumassessment.org)** introduced in 2001-2005 a new framework for analyzing social-ecological systems that had wide influence in the policy and scientific communities. New research is needed that considers the full ensemble of processes and feedbacks, for a range of biophysical and social systems, to better understand and manage the dynamics of the relationship between humans and the ecosystems on which they rely.

The **Global Earth Observation System of Systems (GEOSS; www.earthobservations.org/geoss.shtml)** provides decision-support tools to decision-makers, planners and emergency managers, by proactively linking together existing and planned observing systems and supporting the development of new systems where gaps currently exist, regarding natural and human-induced disasters, the environmental sources of health hazards, energy resources, etc.

At the European level

Many European-wide research programmes and strategic activities have been developed over the last few decades, especially within the European Commission, the European Science Foundation, and its national Member Organisations. Among others, several organisations or programmes have also addressed relevant global change issues as follows:

The **Global Monitoring for Environment and Security (GMES; www.gmes.info)** was set up for the implementation of information services helping European citizens to improve their quality of life regarding environment and security, using earth observation satellites and ground-based sources. Through GMES the state of our environment and its short, medium and long-term evolution will be monitored to support policy decisions or investments. The key components of the GMES services in pre-operational mode are: marine, atmospheric and land environmental services; support to emergencies and humanitarian aid; support to security-related activities.

The **European Platform for Biodiversity Research Strategy (EPBR; www.epbrs.org)** is a forum at which, since 1999, natural and social scientists, policy-makers and other stakeholders identify, structure and focus the strategically important research that is essential to conserve biodiversity, to use its components in a sustainable way, to make sure that the arising benefits are shared in an equitable way – and last but not least – to stop biodiversity loss.

The **European Strategy Forum on Research Infrastructures (ESFRI; cordis.europa.eu/esfri)** was established in 2002 to support a coherent and strategy-led approach to policy-making on research infrastructures in Europe, and to facilitate multilateral initiatives leading to the better use and development of research infrastructures, at EU and international level. ESFRI acts therefore as an incubator for pan European Research Infrastructures. ESFRI is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach.

The **European Research Advisory Board (EURAB; ec.europa.eu/research/eurab)** is a high-level, independent, advisory committee created in 2001 to provide advice on the design and implementation of EU research policy, from a wide range of academic and industrial backgrounds, as well as with a societal perspective. EURAB delivers advice and opinions on specific issues either at the request of the Commission or on its own initiative.

The **European Institute of Innovation and Technology (EIT, ec.europa.eu/eit)** is an initiative which aims to promote excellence in European innovation in order to face the challenges of globalisation. Its mission is to explore excellence in entrepreneurship education, research and business for world class innovation. It integrates fully the three sides of the "Knowledge Triangle" (Higher Education, Research, Business-Innovation) and seeks to stand out as a world-class innovation-orientated reference model, inspiring and driving change in existing education and research institutions.

The **European Environment Agency (EEA, www.eea.europa.eu)** was founded in 1993 to provide sound, independent information on the environment, and to ensure that decision-makers and the general public are kept informed about the state and outlook of the environment. It is a major information source for those involved in developing, adopting, implementing and evaluating environmental policy, and also the general public. The EEA's

activities are organised under four areas: environmental themes; cross-cutting themes; integrated environmental assessment; information services and communications.

In addition, it is worth mentioning few other initiatives:

- the “**Potsdam Memorandum**” on the need for a great transformation for global sustainability (www.nobel-cause.de/potsdam-memorandum)
- the **Network for Trans-disciplinary Research** (td-net; www.transdisciplinarity.ch)
- the **International Center for Transdisciplinary Research** (CIRET; nicol.club.fr/ciret)
- the “**Interdisciplines**” Project (www.interdisciplines.org)
- the **Center of Transdisciplinary Studies for Development** (CETRAD; www.cetrad.info)

Education, capacity building and outreach

A major obstacle to interdisciplinary research is the “classical” fragmented mentality which prevails within scientific disciplines, and the related teaching programmes and administrative structures of universities and research institutions. To overcome this problem, as a complement to the research and strategic activities listed above, numerous educational and capacity building activities with clear interdisciplinary value have recently been developed through specific programmes, schools or curricula. A preliminary survey has been already run on this matter. It shows that the educational activities frequently identify or develop best practices in interdisciplinary teaching and learning, but no European initiatives really encompass all relevant aspects for global change issues. It is clear for the proposers that a special emphasis on interdisciplinary education and capacity building in developing and developed countries should be included in the Forward Look activities. A portfolio of lessons learnt, success stories, “model” pilot experiences and best practices would be very useful for education and capacity building and as incentive for further engagement of young researchers in global change research.

In this respect, due to the lack of a comprehensive approach, key questions could be considered for education, such as:

- How are the various scientific disciplines liaised and combined in educational activities?
- How are specialised and interdisciplinary summer schools organised?
- How is interdisciplinary science education organised, assessed, monitored, promoted and used?
- How can more students and young researchers engage in interdisciplinary research?

Similarly, engagement of the public in a “dialogue” with scientists, and outreach toward policy makers are considered essential, in view of the complexity of the issues at stake in relation to global change. A successful dialogue will also help to further articulate and focus the most relevant research questions. This is an essential element of an effective interdisciplinary approach.

Purpose and objectives of the Forward Look

Purpose

The Forward Look RESCUE will focus on identifying emerging, neglected or insufficiently supported research areas, integrating across disciplines and societal actors, major environmental and developmental issues. It will aim at developing new approaches, paradigms, and opportunities for improved linkages among natural and social sciences, and will also help further structuring, funding and promoting global change research and developing evidence-based policies, across Europe. It will connect all key actors and stakeholders in Europe to not only have a scientific vision for sustainable governance, but to also make it possible for them to develop a clear and realistic implementation plan for research, education and capacity building and for transfer of knowledge to industry.

Objectives

The two key challenges – the scientific vision and its implementation – require urgent and marked engagement of both key disciplines and key research organisations. RESCUE will offer a unique opportunity to gather the necessary critical mass throughout Europe, for innovative, systemic and integrative sciences to understand the Earth System, its relations to the human dimension, and to influence the societal choices for global sustainable governance.

In this context, this Forward Look has the overall objective to address the societal needs that require understanding of global change – especially including its human dimension – and to stimulate an appropriate and integrated response from natural, social and human sciences.

This objective will be achieved through the following key tasks:

1. To propose a strategic process for natural, social and human sciences to improve their interdisciplinary synergy in order to respond efficiently to policy-relevant and societal needs:

- link further natural, social and human sciences in the field of global change research and for sustainable governance,
- reinforce the societal recognition of the urgent need for mitigation and adaptation, and the intergovernmental consensus for actions;
- consider the societal needs and drivers, including science accountability, societal problems and economic opportunities;
- engage related communities through an open forum including industry, European organisations, non-governmental organisations and the general public;
- promote participatory approaches, for natural and social sciences and for technological development;
- develop actions for local-to-global perspectives and with particular emphasis on regional studies.

2. To articulate scientific issues related to global change, especially those of trans-disciplinary nature or of major society-driven relevance:

- identify major emerging neglected or insufficiently supported areas (gaps, opportunities and overlaps) in global change research;
- provide incentives to interdisciplinary research projects and programmes through appropriate funding and support mechanisms in Europe;

- develop systemic, integrated recommendations about research and governance priorities (with adequate monitoring, review and evaluation standards and appropriate recognition).

3. To explore new approaches towards interdisciplinary science, and to facilitate the 'revolution' in education and capacity building it requires:

- integrate the scientific communities (as individuals and as researchers connected to research funding agencies) in cooperation with existing international activities,
- mobilise a critical mass in the research and education communities to contribute to the initiative and by insuring the proper recognition of its efforts,
- overcome the fragmentation among the various European countries and research organisations and also across the relevant disciplines in global change research,
- reinforce the science-monitoring-assessment-policy links,
- identify and develop best practices and common target objectives for interdisciplinarity among the research and education communities
- involve the learned societies, universities and research organisations, the relevant private sector and NGOs for long-term impact on general public and decision-makers in Europe,
- propose an implementation plan to address key challenges, by creating new support for interdisciplinary opportunities;
- encourage a critical evaluation of current curricular and administrative barriers to interdisciplinary research and education in the context of ongoing university reforms in Europe.

Added value for Europe

Over the last two decades, several activities have been initiated at the European level to address the issue of global change. In 2002-2003, the European Science Foundation launched a Forward Look on “Europe’s contribution to global change research” and presented a series of general recommendations that are in most cases still valid. The present Forward Look will build on these recommendations towards the long-term strengthening of the European Research Area, and will represent a clear added value for European citizens.

Added value for the European Research Area (ERA)

- European scientists have a long and distinguished history in the fields relevant to this Forward Look, not only in natural sciences, but also in social and human sciences where Europe is clearly the world leader. This Forward Look will help reinforcing this position.
- Regardless of its fragmentation, Europe aims to set up long-term visions and roadmaps for issues of socio-economic relevance at the national, multinational and international levels by exploring emerging and neglected areas, e.g., Greenland ice cap melting, impacts of ocean acidification, human migrations due to climate change. Through this Forward Look, Europe will maintain and strengthen its ability to tackle the relevant challenges.
- Europe has a leading role in many technological areas including green and sustainable energies. The Forward Look will help improving the links between green economy, environmental technology and geo-engineering. This will contribute to the integration of the national efforts of research organisations in a coherent ERA, taking full advantage of the “joint programming” approach.
- Due to the complexity of the problems, academia and the private sector only starts recognising the need to adapt to new questions, new approaches and new paradigms with an integrated approach. The new challenges create new science opportunities for a truly interdisciplinary, systemic approach, which could not be only driven by disciplinary questions. This Forward Look will map out these challenges.
- Towards this end, a new generation of global change scientists must be trained with new integrative skills in Europe. Experience-based knowledge about how best to grow and nurture this capability will be collated in the Forward Look.
- The Forward Look could identify improved means for science-society communication, outreach activities and communication. It will create a forum to deliver clear message to policy makers, to industry, and to society.

Added value for the European citizens

- Society at large needs to address the remaining uncertainties in the natural signals of global change and its social-economic and cultural impacts, and be informed about technological and medical options for the regionalization of response efforts.
- The global awareness about the direct impact of global change on society needs to be reinforced. Are European citizens ready to listen to scientists and policy makers about the necessary adaptation and changes in their lifestyle to overcome the present problems?
- Improving public and political understanding of the complexity of the global change science and its implications will facilitate the associated decision-making processes.
- Europe needs to optimise its resources, e.g. mobilise and engage the relevant science community, research funding and performing organisations, so that initiatives for better policy advice can be encouraged.
- Europe brings the critical mass in terms of human resources and knowledge to address such a global problem, and the associated research infrastructures could be optimized through European synergy.
- There is a growing level of urgency of the actions required for mitigation and adaptation, and a need for designing actions with appropriate application of the precautionary principle, to avoid the unintended consequences of human activities.

Working Groups of the Forward Look

The activity of the Forward Look will be mainly structured around 4 Working Groups.

Working Group 1: Collaboration between the natural, social and human sciences in global change studies

In nearly all domains of Earth System science, the role of humans is a key factor as, e.g., a driving force, a subject of impacts, or an agent in mitigating impacts. Effective research collaboration can take shape only if programmes are developed in pro-active collaboration of scientists of different disciplines from the very start in order to develop a joint research framework including agreed semantics and a common agenda. This Forward Look has an important role to play in proposing a strategic vision to break down the individual and institutional barriers that hamper collaboration across Europe between the physical, natural, medical and social sciences and humanities in global change studies.

Coordinator(s) of the WG setting up: Rik Leemans + social/human scientist(s)

Key questions to be addressed:

- What is the state-of-the-art about the definition and mapping of the interfaces between disciplines, and the related barriers, and the gaps in knowledge for global change?
- Which disciplinary areas are already engaging in cooperative, integrative efforts in global change research?
- What is the international agenda of the disciplines involved, and of those not involved but required in the collaboration?
- Can existing building blocks be identified in each contributing discipline that optimise the strength of the global change research in Europe?
- What should the balance be between “classical” discipline-based research and interdisciplinary research?
- How is it possible to trigger effective and fruitful collaboration at the interface between different fields?
- What means exist to identify and mobilise “disciplinary” scientists, funding agencies and stakeholders to participate and contribute to this joint effort right from the start?
- How might improved interdisciplinarity be targeted within specific domains?
- What are the various scales, i.e. space and time dimensions of processes, envisaged in the various disciplines involved in global change research?
- Overall, how can best practices be promoted between European research organisations to fund activities that could better contribute to solving the RESCUE challenges?

Working Group 2: Requirements for research methodologies and data

Earth System science is crucially dependent on observing and monitoring many natural and social processes, and on conceptualising and modelling them at different space and time scales. In both the natural and social science domains, this need has driven calls for partnerships between the research community, funding agencies, and operational monitoring entities. Increasingly, the cost of collecting, integrating, and archiving accessible data is becoming a significant problem and calls for a new and ambitious data and metadata management strategy across many disciplines, i.e. beyond the World Data Centres system.

Coordinator(s) of the WG setting up: Sierd Cloetingh + social / human scientist(s)

Key questions to be addressed:

Methodological issues

- What is required in order to involve disciplines focusing on unquantifiable concepts more than on data?
- How might Earth system modelling be reconceptualised in this context?
- How does interdisciplinarity translate into coupling/integrating the models and optimise their application in different disciplines and for long-term scenarios?
- How to make use of scientific information for policymakers (indicators, factors, risks, options)?

Data-related issues

- Is current data management suitable for a trans-disciplinary approach?
- What is the need for multidisciplinary data to perform this interdisciplinary research?
- How can the appropriate research infrastructures and services be developed?
- How should the existing datasets available be combined, standardised and made accessible?
- How can existing datasets be analyzed with a new, trans-disciplinary view?
- How best to ensure the sustainability of the interdisciplinary datasets for their long-term use and valuation?

Working Group 3: Towards a ‘revolution’ in education and capacity building

In education as in science related to global change, the dualism of nature and culture as it appears in human organisations is clearly part of the RESCUE challenges, in that it both obstructs our understanding of what is global change and weakens our ability to address those challenges. In this respect, the next generation of researchers will have to integrate disciplines such as human-related ecology and social theory in a truly transdisciplinary way. It is thus essential to overcome the current academic division of work also through a revolution in education system, especially in Europe.

Coordinator(s) of the WG setting up: Alan Jones, Kari Raivio + social / human scientist(s)

Key questions to be addressed:

- How to intensify the discourse between natural, social and human sciences?
- How could ESF and its partners add their voices to help changing the university’s mindset and curricula and insure proper interdisciplinary research and education?
- What are the perspectives of research careers for young researchers in such fields?
- What are the barriers that deter the young researchers from interdisciplinary routes and the incentives to bring them on this route, including human resources within European research organisations?
- How to create and nurture individual and institutional mechanisms to ensure trans-disciplinary educative approaches?
- How to fill the gaps in trans-disciplinary education at the university level which affects the capacity in inter-disciplinary research in Europe?
- What is the impact of the Bologna Process “*Towards the European Higher Education Area*” and the Ljubljana Process “*Towards full realisation of ERA*” on current and future transdisciplinarity education in Europe, specially on global change issues ?

Working Group 4: Interface between science and policy, communication and outreach

Because the interdisciplinary science required to address the RESCUE challenges involves simultaneously many variables and aspects, and is more driven by operational than strategic needs, global change researchers tend not to give policy makers exactly what they want, when they want it. However, researchers have developed valuable information, especially in the form of best practices, scientific consensus and guidelines or targets, which can feed into research policy development for the benefit of policy makers and other stakeholders.

Coordinator(s) of the WG setting up: Sarah Cornell + social / human scientist(s)

Key questions to be addressed:

- How to encourage policy makers to guide research and educational priorities on global change issues?
- How to reconcile the short-term perspective of policy makers, the mid- to long-term perspectives of research funding and performing organisations, and those of the researchers and educators in global change science, especially through participatory processes?
- How to motivate the relevant actors and stakeholders to develop a common science strategy for tackling global change issues?
- How could global change-related activities contribute to the strengthening of the European Research Area, especially through policy development, integration and implementation?
- How to communicate scientific results, including their associated uncertainties, to the public and more generally to the civil society?
- How to best develop good communication tools specific to global change research and the required interdisciplinarity, tailored to different audience targets?

Schedule of foreseen activities

Date	Task	Deliverables
Month 1	Starting the activities	Launch event
Month 2-7	Gathering of data for the preparation of working papers;	Workshops and reports
Month 8	Meetings of the working groups, involving stakeholders	Workshops and reports
Month 9	Merging the data	Alignment workshop
Month 12	Consensus conference: production and presentation of the draft of the final report	Conference. "Green paper"
Month 13-18	Dissemination actions and feedback from stakeholders	Final report: "White Paper" including perspectives; recommendations and scenarios.
Month 18	Final Conference and dissemination	Report on the dissemination actions. Final conference

Timeline



Participants in the preparatory meetings

30/05/2008, ESF Headquarters, Strasbourg

Participants

Patrick Monfray (CNRS-INSU; Deputy Director for Oceanic and Atmospheric Sciences)
Pierre Friedlingstein (CNRS-INSU; Chargé de Mission ESS)
Pascale Ebner (CNRS-INSU; Support Engineer)

ESF staff

John Marks (ESF Director of Science and Strategy)
Inge Jonckheere (ESF-LESC Science Officer)
Didier Hauglustaine (ESF-LESC Science Officer)
Bernard Avril (ESF-LESC Science Officer)

25/08/2008, CNRS Headquarters, Paris

Participants

Patrick Monfray (CNRS-INSU; Deputy Director for Oceanic and Atmospheric Sciences)
Dominique Le Quéau (CNRS-INSU; Director)
Martin Rice (Earth System Science Partnership (ESSP) Coordinator)

ESF Standing Committee members

Alex Quintanilha (Chair of LESC-SC)
Alan Jones (Dublin Institute for Advanced Studies; member of LESC-SC)
Francoise Gaill (CNRS; member of LESC-SC)

ESF staff

Bernard Avril (ESF-LESC Science Officer)

05-06/11/2008, ESF Headquarters, Strasbourg

Participants

Sarah Cornell (University of Bristol, NERC-QUEST)
Michael Keenan (Manchester Institute of Innovation Policy; OECD)
Patrick Monfray (CNRS-INSU; Deputy Director for Oceanic and Atmospheric Sciences)
Martin Rice (Earth System Science Partnership (ESSP) Coordinator)
Thomas Rosswall (International Council for Science (ICSU) Executive Director)

ESF Standing Committee members

Alan Jones (Dublin Institute for Advanced Studies; member of LESC-SC)
Paavo Pelkonen (Univ. of Joensuu; member of LESC-SC)

ESF staff

John Marks (ESF Director of Science and Strategy)
Arja Kallio (ESF-LESC Head of Unit)
Bernard Avril (ESF-LESC Science Officer)
Didier Hauglustaine (ESF-LESC Science Officer)
Frank Kuhn (ESF-SCSS Science Officer)
Thibaut Lery (ESF-Chief Executive Unit Science Officer).

24-25/02/2009, Brussels

Participants

Geoffrey Boulton (Grant Institute, Univ. Edinburgh)
Sierd Cloetingh (Institute of Earth Sciences, VU Amsterdam)
Sarah Cornell (University of Bristol, NERC-QUEST)
Reinhard Hüttl (German Research Centre for Geosciences, Potsdam)
Rik Leemans (Chair of the Earth System Science Partnership (ESSP) Scientific Committee)
John Marks (former ESF Director of Science and Strategy)
Patrick Monfray (CNRS-INSU; Deputy Director for Oceanic and Atmospheric Sciences)
Kari Raivio (Scientific Planning and Review Committee of ICSU)
Leah Goldfarb (ICSU Secretariat)

ESF Standing Committee members

Reinhard Ceulemans (Chair of LESC-SC)
Jones Alan (Dublin Institute for Advanced Studies; member of LESC-SC)
Sir Roderick Floud (Chair of SCSS) (*last minute cancellation*)

COST Domain Committee member

Ipek Erzi (Vice-Chair of COST ESSEM DC)

ESF staff

Bernard Avril (ESF-LESC Science Officer)
Didier Hauglustaine (ESF-LESC Science Officer)
Thibaut Lery (ESF-Chief Executive Unit Science Officer).

Preliminary expressions of interest received from other ESF and COST Committees

ESF

Standing Committee for Humanities (SCH)
Standing Committee for Physical and Engineering Sciences (PESC) – *to be confirmed*
European Medical Research Councils (EMRC) – *to be confirmed*
Marine Board (MB)
European Space Sciences Committee (ESSC)
European Polar Board (EPB) – *to be confirmed*

COST

Earth System Science and Environmental Management (ESSEM)
Individuals, Societies, Cultures and Health (ISCH)