COST and the Earth System Sciences and Environmental Management Domain

An opportunity for the GeoHazards Community of Practice of GEO ?

Dr. Carine Petit

1st workshop of GHCP

18-21 January 2010, Paris

COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract

What's COST and COST mission

COST - European **CO**peration in **S**cience and **T**echnology research was the first and is the widest European network for the **coordination of nationally funded** research activities

Strengthen Europe in scientific and technical research through the support of cooperation and interaction between European researchers

COST is based on an intergovernmental framework for cooperation agreed following a Ministerial Conference in 1971

COST does not fund research, but networking activities!

Characteristics COST Actions

- Co-ordination of EU research through networking
- Responsibility of countries for financing the researchers
- **Pan-European** with international cooperation
- **Multi-disciplinary** (can be pre-normative)
- **“Bottom-up”** – no fixed programme/priorities
- **Flexible participation** – any country can join at anytime
- Open to companies, Administrations, European organisations, International organisations based in Europe
- Focus on young researchers: PhD student or PhD less than 8 years

What is funded by COST?

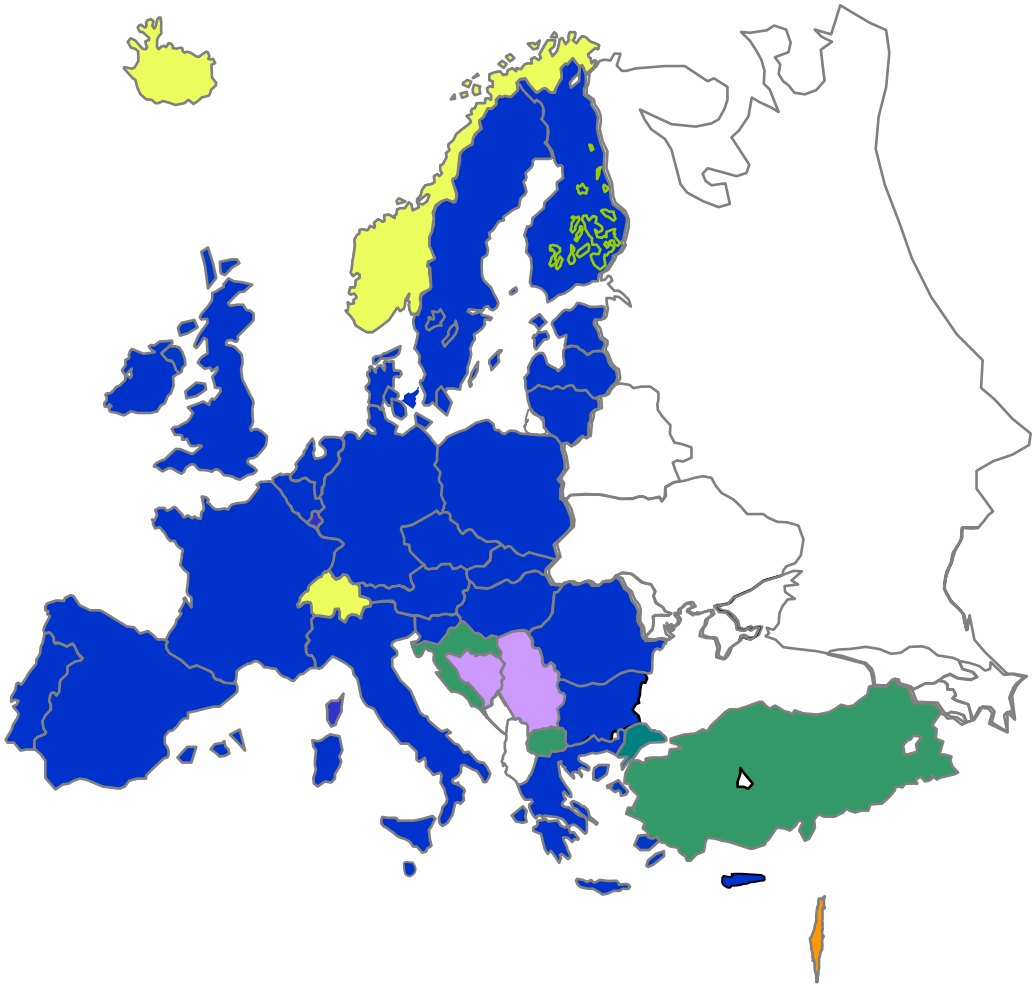
- COST Actions: Researchers from min. 5 COST countries

- **Science management meetings for implementation of a joint scientific programme (MOU + technical annex)**
- **Scientific workshops, seminars, research conferences**
- **Short Term Scientific Missions (STSMs)**
- **Training Schools**
- **Dissemination: scientific papers, book, special issue, poster, leaflets, CDs, website, etc.**

Average funding: ~100 k€/y depending on number of countries
Duration: 4 years

- Exploratory/Strategic Workshops: to explore future scientific or societal needs, support policy developments or initiate new activities

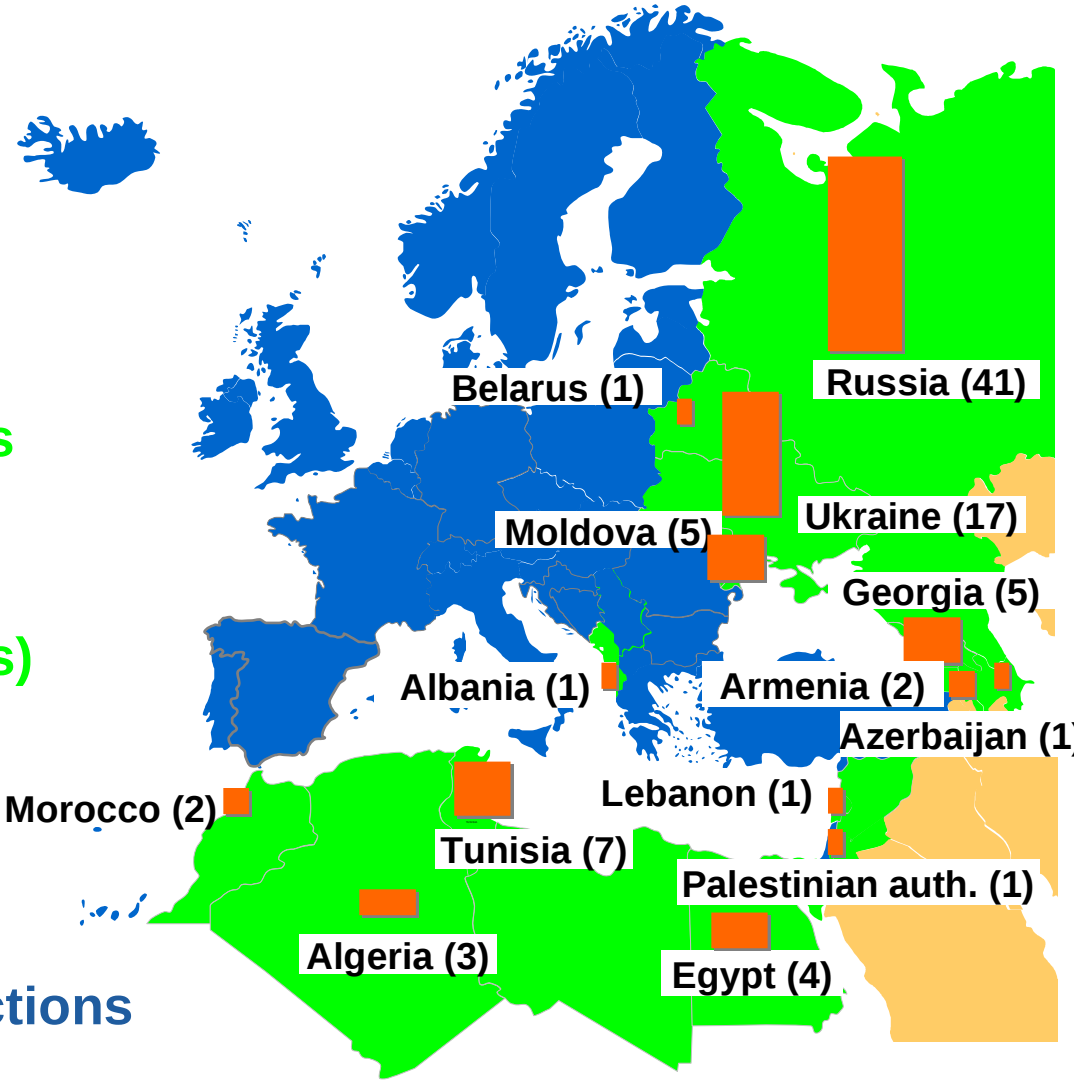
36 COST Countries



- The 27 EU Member States
- EFTA Member States
  - Iceland
  - Norway
  - Switzerland
- Acceding & Candidate Countries
  - Croatia
  - FYR of Macedonia (FYROM)
  - Turkey
- Potential Candidate Countries
  - Bosnia and Herzegovina
  - Republic of Serbia
- COST Co-operating States
  - Israel

COST and the Neighbouring Countries

- COST countries
- COST neighbouring countries

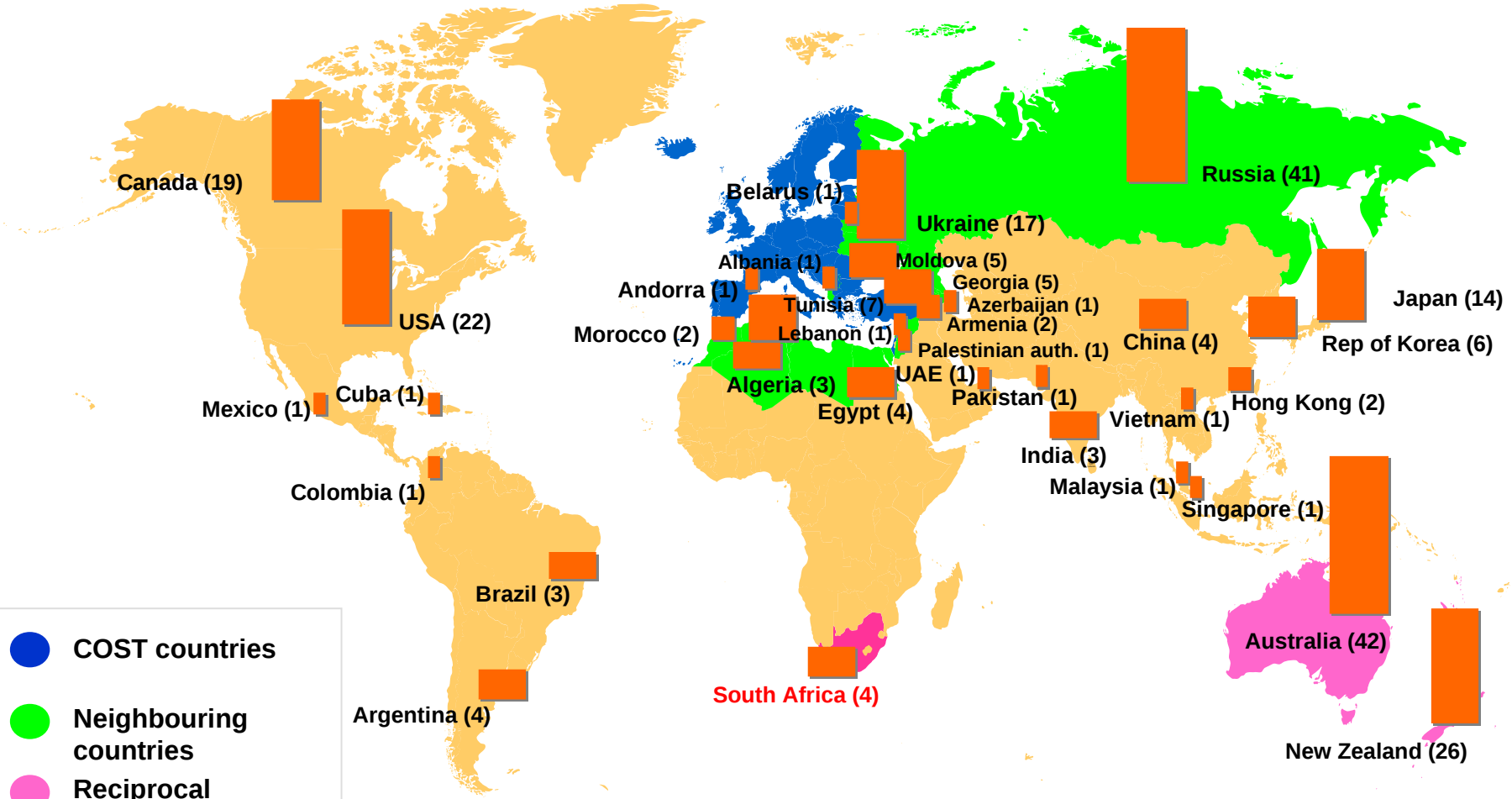


- **Special budget line in the COST system to facilitate collaborations**
- **Specific exchange activities (Short Term Scientific Missions, focus on Early Stage Researchers)**

In 2009: 90 participations in 45 Actions

COST Actions: global participation (status: May 2009)

Newly signed: reciprocal agreements with South Africa

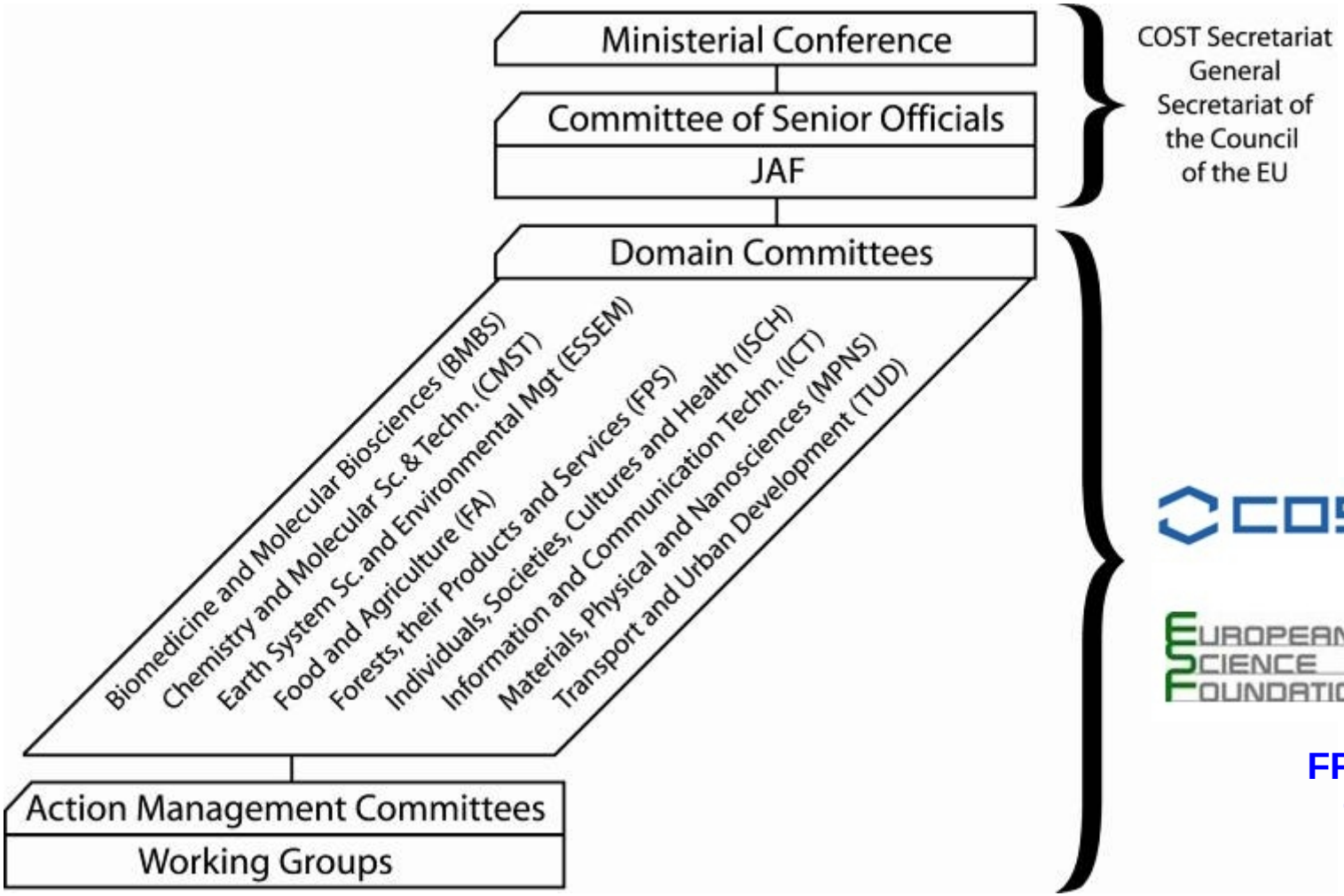


251 participations in 103 Actions (36 countries)

COST in FP7: Legal Base

- The decision of the European Parliament and of the Council of 18 December 2006 concerning the 7th RTD Framework Programme (2007-2013) foresees “financial support for the administration and coordination activities of COST".
- Annex II of the Specific Programme 'Cooperation', in the budget of the FP7 Programme, stipulates the financial support for COST: **“Of which at least EUR 210 million and up to EUR 250 million for COST, subject to the mid-term evaluation.”**
- In 2009, ~230 on-going Actions
- 60 new Actions selected from 2 Collecting dates per year

COST Governance

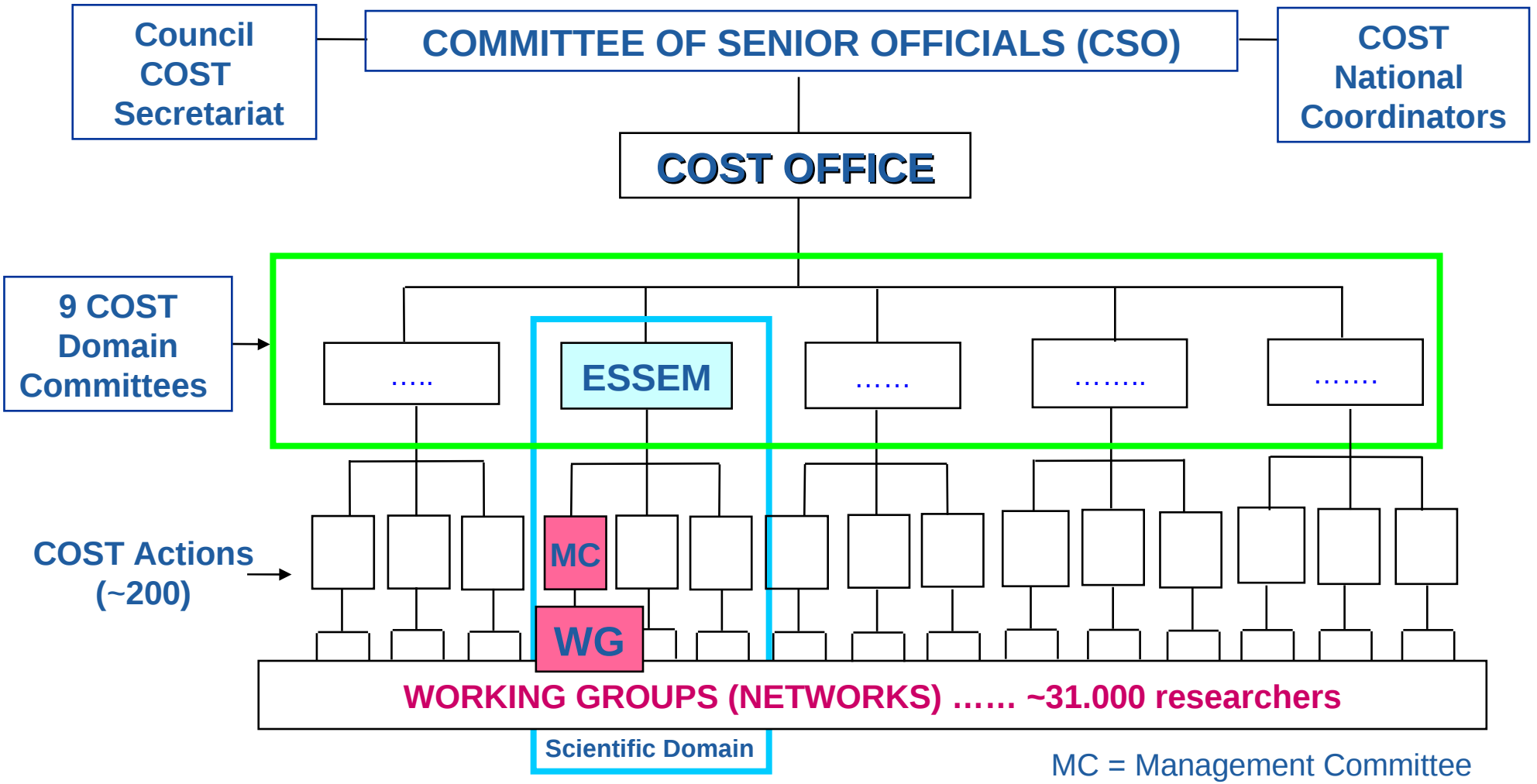


cost OFFICE

EUROPEAN SCIENCE FOUNDATION

FP7 contract with the European Community

COST Structure



9 COST Scientific and Technical Domains


Biomedicine and Molecular Biosciences (BMBS)


Chemistry and Molecular Sciences & Technologies (CMST)


Earth System Science & Environmental Management (ESSEM)


Food & Agriculture (FA)


Forests, their Products and Services (FPS)


Individuals, Society, Culture & Health (ISCH)


Information & Communication Technologies (ICT)


Materials, Physical & Nanosciences (MPNS)


Transport & Urban Development (TUD)

+ Trans-Disciplinary Proposals can be submitted to Open Calls

ESSEM

COST-ESSEM Domain

Earth System Science and Environmental Management

Domain Committee Chair:
Prof. Sylvain Joffre (FI)

ESSEM

ESSEM – Domain Description

Scope: The domain aims at better understanding, observing, modelling and predicting the Earth system and thereby at improving the management of environmental conditions.

- Modelling and understanding of Earth systems: physical and biochemical principles
- **Prediction and mitigation of hazards**
- Environmental Management of natural resources and minimising environmental degradation

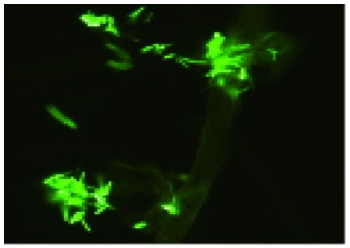
History:

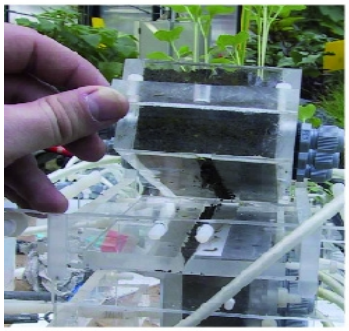
1971 TC “Meteorology”

1972 TC “Environment”

2006 Domain ESSEM

29 running Actions





cost 631

Handbook of Methods Used in Rhizosphere Research

Jörg Luster, Roger Finlay (Editors)

Brunner, I.; Fitz, W.J.; Frey, B.; Göttlein, A.; Helmisaari, H.-S.; Jaillard, B.; Jones, D.L.; Martin-Laurent, F.; Neumann, G.; Nietfeld, G.; Nowack, B.; Puschenreiter, M.; Robin, C.; Schweiger, P.; Senesi, N.; Turnau, K.; Wenzel, W.W. (Chapter Editors)

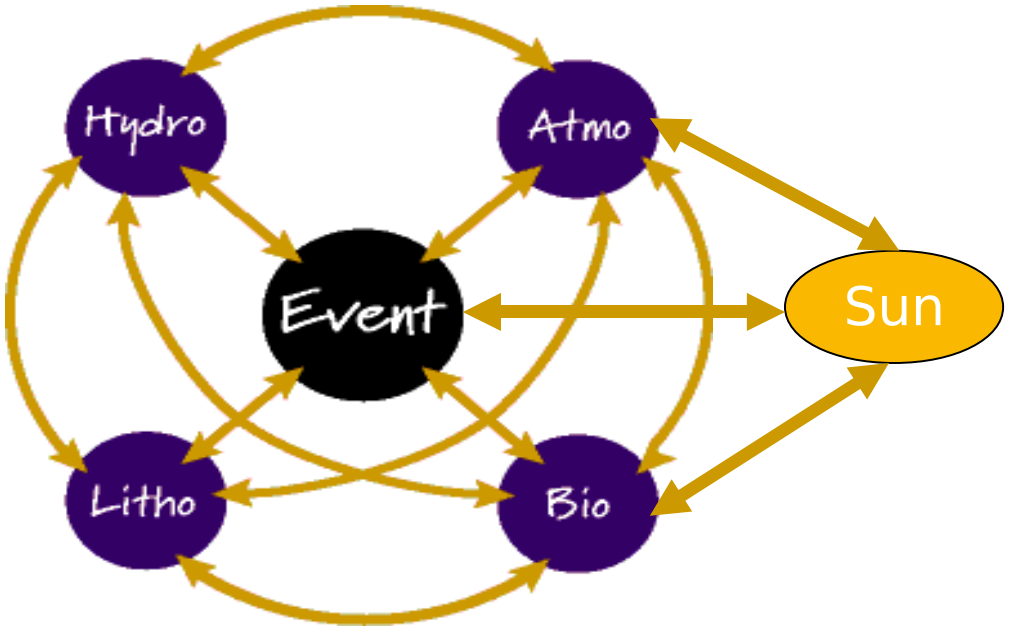
COST is supported by the EU RTD Framework Programme

ESF provides the COST Office through an EC contract

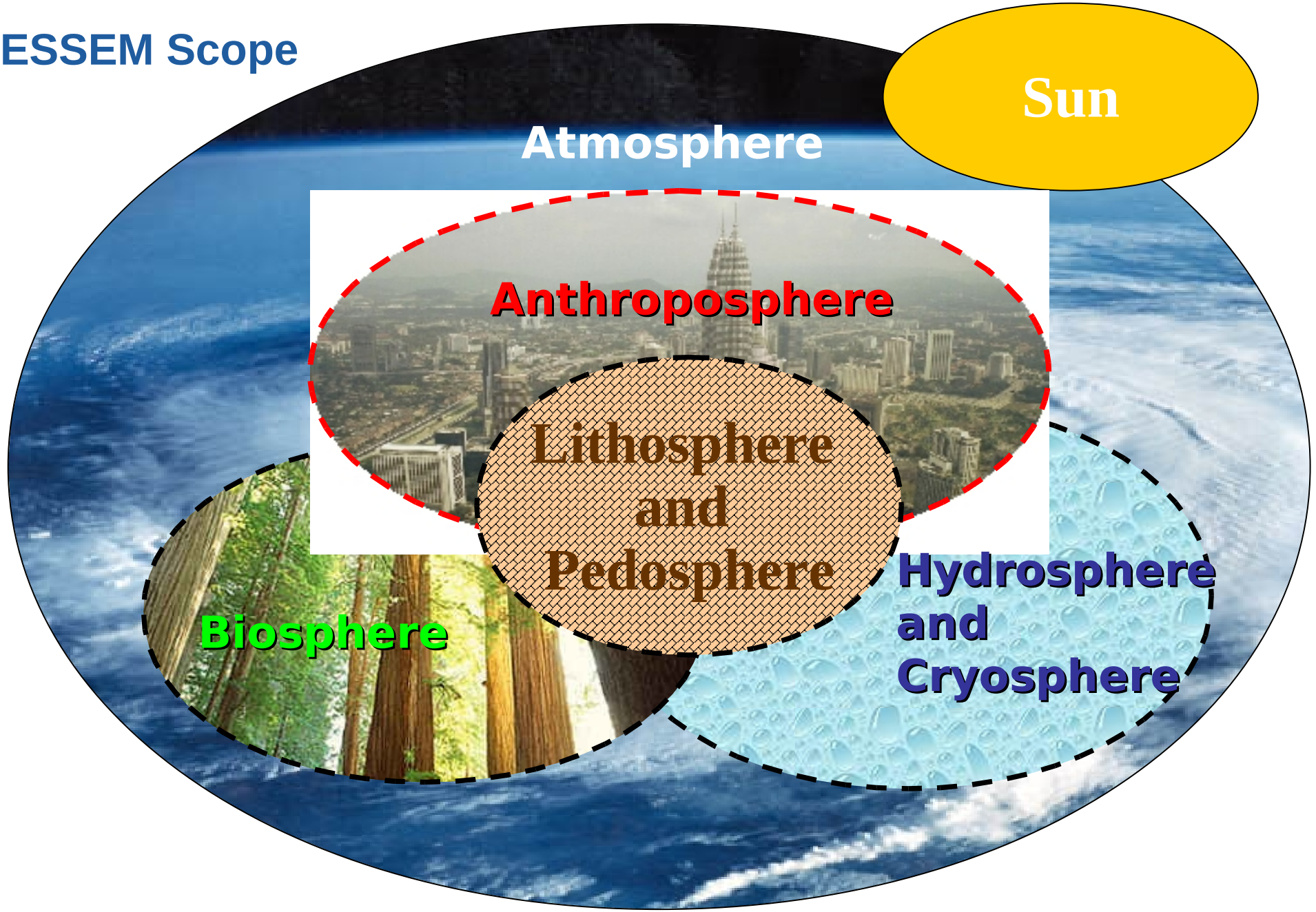
Swiss Federal Research Institute WSL

ESSEM Domain – Thematic Areas

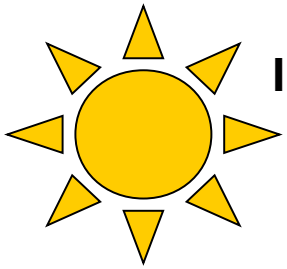
- Biodiversity
- Climate Change
- Instrumentation networks and technologies
- Hazards forecasting and detection
- Hydrology
- Meteorology and meteorological operational capacities
- Oceanography
- Soil processes and land degradation
- Water, air and soil pollution



ESSEM Scope


Sun
Atmosphere
Anthroposphere
Lithosphere and Pedosphere
Biosphere
Hydrosphere and Cryosphere

ESSEM Actions Portfolio



Sun-Earth Interactions

1 Action

4 Actions

Risk Assessment & Health

3 Actions

Soil Sciences

Biogeochemical cycles

Ecology, Biodiversity

Natural Resources Management

4 Actions

5 Actions

Hydrology

Meteorology

Air quality/chemistry

Geodesy

Geology

Marine Sciences

3 Actions

4 Actions

Global Climate System and Changes

Environmental Monitoring & Observing Technologies

4 Actions

New Actions in 2009

- 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: 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: Integrating ice core, marine and terrestrial records (60,000 to 8000 years ago)

Some ESSEM Success stories

COST is supported by
the EU RTD Framework Programme

ESF provides the
COST Office through an EC contract

ESSEM

First Success Story: European Centre for Medium-Range Weather Forecasts (ECMWF) from COST Action 70

ECMWF

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European Centre for Medium-Range Weather Forecasts

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Forecasts

We are an international organisation supported by 28 States. We provide operational medium- and extended-range forecasts and a state-of-the-art super-computing facility for scientific research.

Video about numerical weather prediction at ECMWF

EuroNews

10 September 2007 Earlier this year, EuroNews produced a video at ECMWF about the process of numerical weather prediction, with explicit emphasis on early warning of severe weather events.

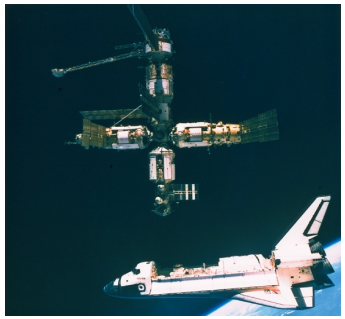
2007 Session of the ICG on the WMO Information System

06 September 2007 From 4-7 September 2007 ECMWF, jointly with the UK Met Office, hosted the annual session of the Intercommission Coordination Group on the WMO Information System (WIS).

EUMETCAL Workshop

Hot Links

Forecasts | EPSgrams
GEMS Project | Seasonal Forecast
Data Server | Reanalysis
Ocean Analysis | Data Services
MARS | WMO

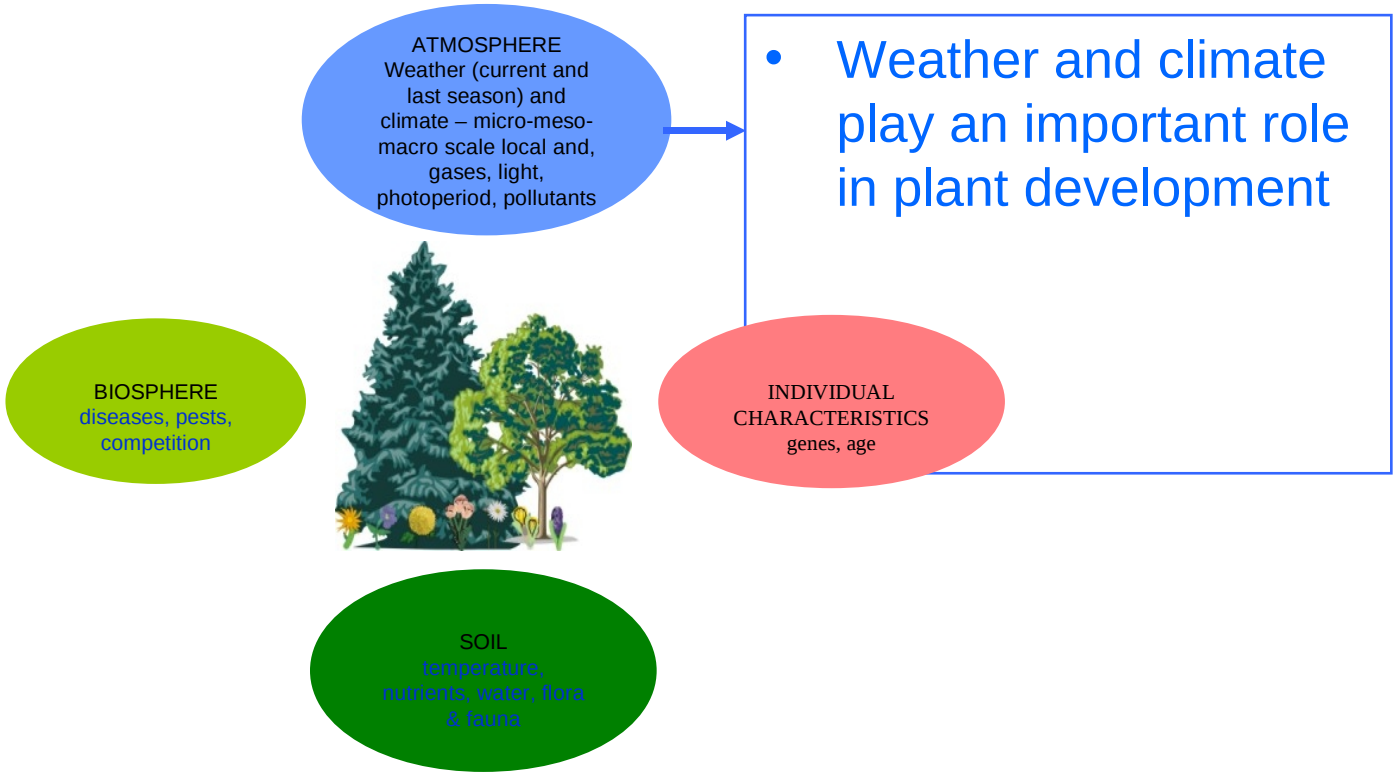


COST 724 - Developing the basis for monitoring, modelling and predicting Space Weather - set up a Space Weather Portal in collaboration with ESA

INTERCAFE

ESSEM

Success story – COST 725 Establishing a European Phenological Data Platform (hosted by EUMETNET) for Climatological Applications – *now in GEO !*



Success story
COST 725 work was recognized by IPPC:

European reference data set of phenological observations

Evidence of Climate Changes in Europe

IPCC, AR4, WG II report, chapter 1 - page 113: Box 1.3. "Phenological responses to climate in Europe: the COST725 project".

Box 1.3. Phenological responses to climate in Europe: the COST725 project

The COST725 meta-analysis project used a very large phenological network of more than 125,000 observational series of various phases in 542 plant and 19 animal species in 21 European countries, for the period 1971 to 2000. The time-series were systematically (re-)analysed for trends in order to track and quantify phenological responses to changing climate. The advantage of this study is its inclusion of multiple verified nationally reported trends at single sites and/or for selected species, which individually may be biased towards predominant reporting of climate-change-induced impacts. Overall, the phenology of the species (254 national series) was responsive to temperature of the preceding month, with spring/summer phases advancing on average by 2.5 days/°C and leaf colouring/fall being delayed by 1.0 day/°C.

The aggregation of more than 100,000 trends revealed a clear signal across Europe of changing spring phenology with 78% of leaf unfolding and flowering records advancing (31% significantly (sig.)) and only 22% delayed (3% sig.) (Figure 1.6). Fruit ripening was mostly advanced (75% advancing, 25% sig.; 25% delayed, 3% sig.). The signal in farmers' activities was generally smaller (57% advancing, 13% sig.; 43% delayed, 6% sig.). Autumn trends (leaf colouring/fall) were not as strong. Spring and summer exhibited a clear advance by 2.5 days/decade in Europe, mean autumn trends were close to zero, but suggested more of a delay when the average trend per country was examined (1.3 days/decade).

The patterns of observed changes in spring (leafing, flowering and animal phases) were spatially consistent and matched measured national warming across 19 European countries (correlation = –0.69, $P < 0.001$); thus the phenological evidence quantitatively mirrors regional climate warming. The COST725 results assessed the possible lack of evidence at a continental scale as 20%, since about 80% of spring/summer phases were found to be advancing. The findings strongly support previous studies in Europe, confirming them as free from bias towards reporting global climate change impacts (Menzel et al., 2006b).

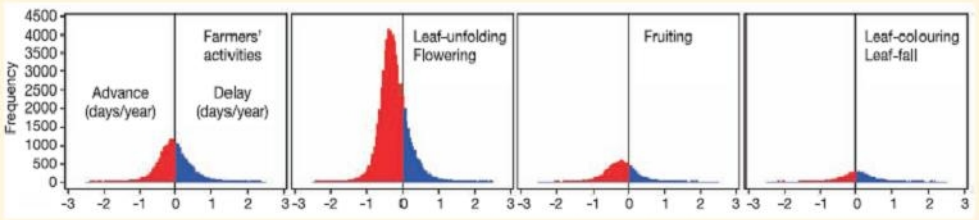


Figure 1.6. *Frequency distributions of trends in phenology (in days/year) over 1971 to 2000 for 542 plant species in 21 European countries. From Menzel et al. (2006b).*

Some ESSEM on-going Actions

COST 639: Greenhouse-gas budget of soils under changing climate and land use (BurnOut)

- **European integration:** Collection of information for hot spots across different types of land use and site types (soil forming factors).
- **Regional integration:** Collection of information on the effect of land-use change and disturbance within a specific region.
- **Policy integration:** Delivery of information to experts in national GHG Reports.
- **Network of Soil Scientists and collection platform of soil in-situ data**

ECN

Energy research Centre of the Netherlands

COST Action 729 Assessing and Managing Nitrogen Fluxes in the Atmosphere-Biosphere System in EU

NitroEurope: started in February 2006

NITROEUROPE-IP

The nitrogen cycle and its influence on the European GHG balance

Objective: To better quantify the European nitrogen budget and fluxes for the terrestrial biosphere and investigate the coupling with the C-cycle (including methane), through integrated measurements, e.g. N_2O observations and up-scaled modelling

Co-ordinator: M. Sutton, CEH, Edinburgh

Partners: about 65

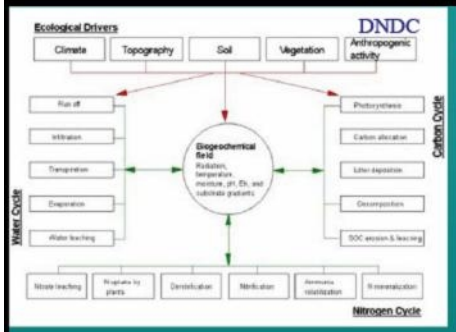
Duration: 5 years

Starting date: 1 February 2006

SUSTAINABLE DEVELOPMENT, GLOBAL CHANGE AND ECOSYSTEMS

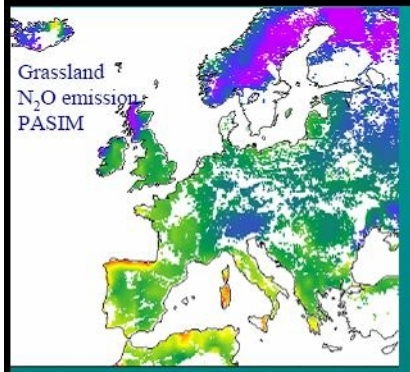
C1 Flux Networks

C2 Manipulation

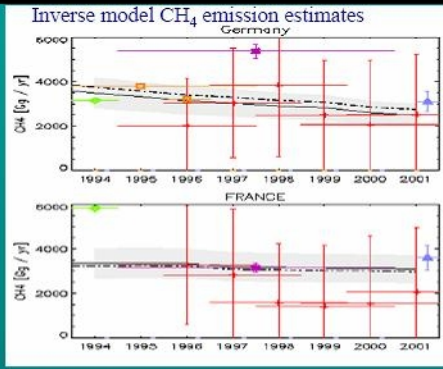


C3 Plot-scale modelling

C4 Landscape analysis

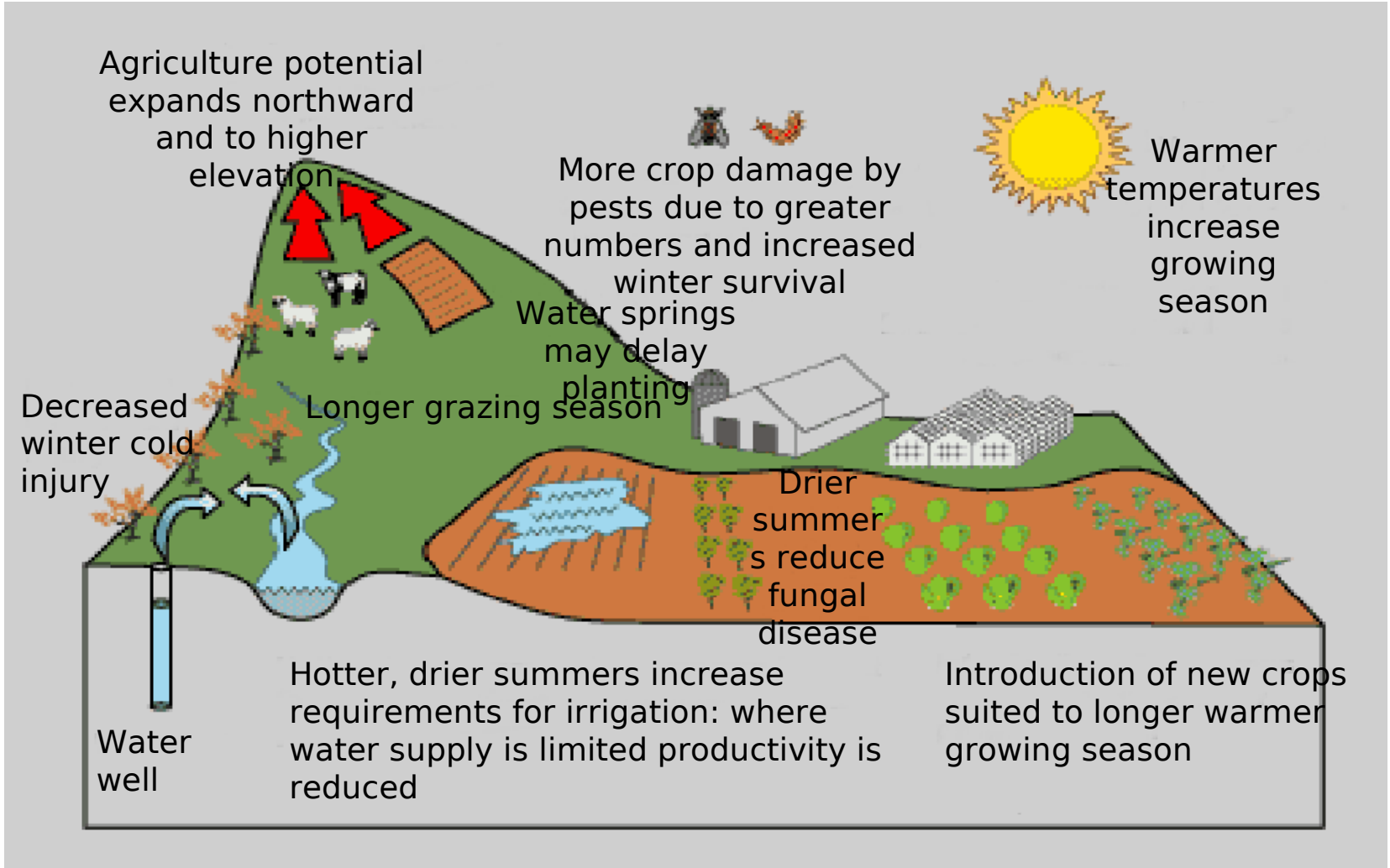


C5 European Integration



C6: Verification

COST 734: Evaluation of **POSSIBLE IMPACTS** from climate change and variability on **AGRICULTURE** and the assessment of critical thresholds for various European areas



COST ES0802: Unmanned aerial systems (UAS) in atmospheric research (end: 2012)

Unmanned aerial systems (plane, sensor, antenna, data transmission, ground station) are of large and increasing importance for environmental monitoring (focus on monitoring of the atmospheric boundary layer and the underlying surface)

They offer cost-efficient data acquisition in remote and dangerous regions.

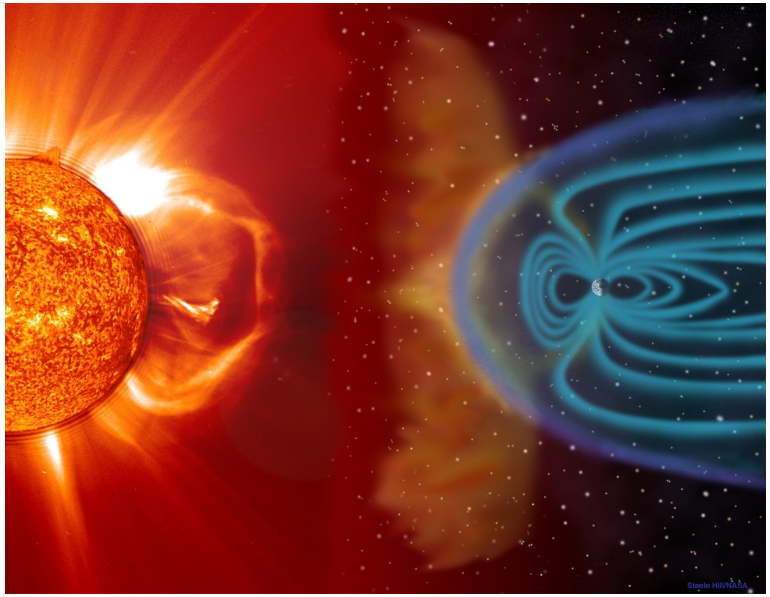
The Action will develop
prototypes for a European fleet.

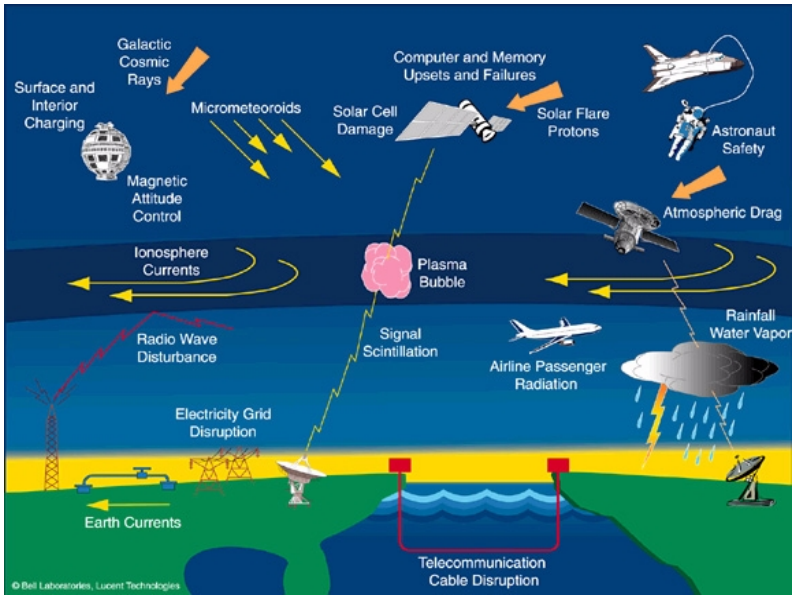
Legal aspects related to safe
and permanent operations.

COST ES0803: Developing space weather products and services in Europe (end: 2012)

In Europe, a better coordination between the national research programmes, and warning system developers and operators is needed to develop European reliable Space Weather observational and forecasting products and services.

They will validate and demonstrate prototypes of near-real time SW information services for operational use.





ESSEM

ES0901 European procedures for flood frequency estimation (FloodFreq – end 2013)

- Pan-European comparison and evaluation of methods for flood frequency estimation under the various climatologic and geographic conditions found in Europe, and different levels of data availability.

Working Groups:

WG1 Compile dataset and inventories of existing data and methods

WG2 Use of statistical methods for flood frequency estimation

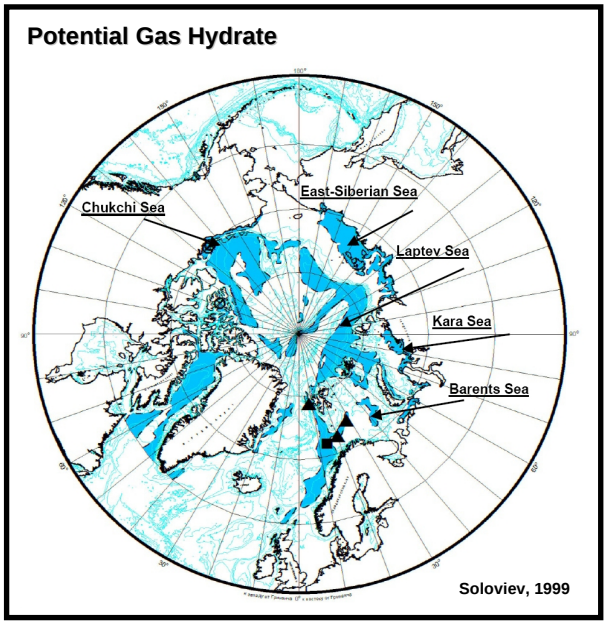
WG3 Flood frequency analysis using rainfall-runoff methods

WG4 Flood frequency estimation methods and environmental change

ESSEM

ES0902 Permafrost and gas hydrate related methane release in the Arctic and impact on climate change: PERGAMON (End 2013)

- To quantify the methane input from marine and terrestrial sources into the atmosphere in the Arctic region
- To evaluate the impact of Arctic methane seepage on global climate.
- To implement a EU cooperation for a long-term monitoring.



WG3 Methane fluxes from the terrestrial environment (wetlands, tundra, Arctic lakes), and remote and land-based atmospheric methane monitoring (ex. GOSAT)

WG4 Data compilation, integration and organization of data distribution among the scientific community

ESSEM

ES0903 Spectral sampling tools for vegetation Biophysical Parameters and Flux measurements in Europe (End 2013)

- **To standardise ground spectroradiometric measurements across different ecosystems**
- To develop common protocols and new instruments within a larger European network for optical measurements
- To bring together scientists from the existing research networks **with** those from scientific instruments **industries.**
- **To analyse the saturation problem of the current vegetation indices**
- To introduce a new low-cost sensor for continuous monitoring of biomass and fluxes.

Other ongoing Actions (1/2)

- **Climate Change**
  - ES0604 - Atmospheric Water Vapour in the Climate System
- **Observing Systems and Networks**
  - ES0702 - European ground-based observations of essential variables for climate and operational meteorology
- **Environment & Health, Biometeorology**
  - 726 - Long term changes and climatology of UV radiation over Europe => important database on cloud coverage
- **Marine Sciences**
  - 735 - Tools for assessing Global air–sea fluxes of climate and air pollution relevant gases => strong interaction with SOLAS
  - ES0801 - The Ocean Chemistry of Bioactive Trace Elements and Paleoclimate Proxies

Other ongoing Actions (2/2)

- **Biogeochemical Cycles**
  - ES0804 - Advancing the integrated monitoring of trace gas exchange between biosphere and atmosphere
- **Biosphere, Ecology**
  - ES0805 - The Terrestrial Biosphere in the Earth System
- **Geodesy**
  - ES0701 - Improved Constraints on Models of Glacial Isostatic Adjustment
- **Air Quality**
  - ES0603 - Assessment of production, release, distribution and health impact of allergenic pollen in Europe => in MACC, PROMOTE
- **Archeology**
  - TD0902: Submerged prehistoric archeology and lanscapes of the continental shelf

Examples of strategic activities

- The Domain Committee has strong relationships with EC, EEA, ESA, ESF, EUMETNET, GMES, GEO/GEOSS, WMO
- COST-ESF Forward Look “European Food Systems in a Changing World”: Report available on ESF website (www.esf.org).
- COST Exploratory Workshops - **The Energy-Water Nexus**: Managing the Links between Energy and Water for a Sustainable Future. 2 years initiative. Participation in EC Side Event at **COP15** on Friday 18!
- Joint ESF/COST Frontiers of Science initiative **RESCUE**: Responses to Environmental and Societal Challenges for Our Unstable Earth. 18 months initiative. Description available on ESF website (www.esf.org).
- Two sessions organised at **EGU2010** (2-7 May):
  - **EG2/CL5.2/ERE6.4:** Responses to Environmental and Societal Challenges for our Unstable Earth (RESCUE) Convener: Bernard Avril | Co-Convener: Carine Petit
  - **EG6:** The contribution of Geoscientists to the development of sustainable participative societies Convener: Carine Petit | Co-Convener: Bernard Avril
- ESF-COST High-Level Research Conference on “Marine Biotechnology: Future Challenges”, 20-25 June 2010, Acquafredda di Maratea, Italy. Deadline for application: 28 March 2010. http://www.cost.esf.org/events/marinebiotech

The "**Open Call**" Scheme

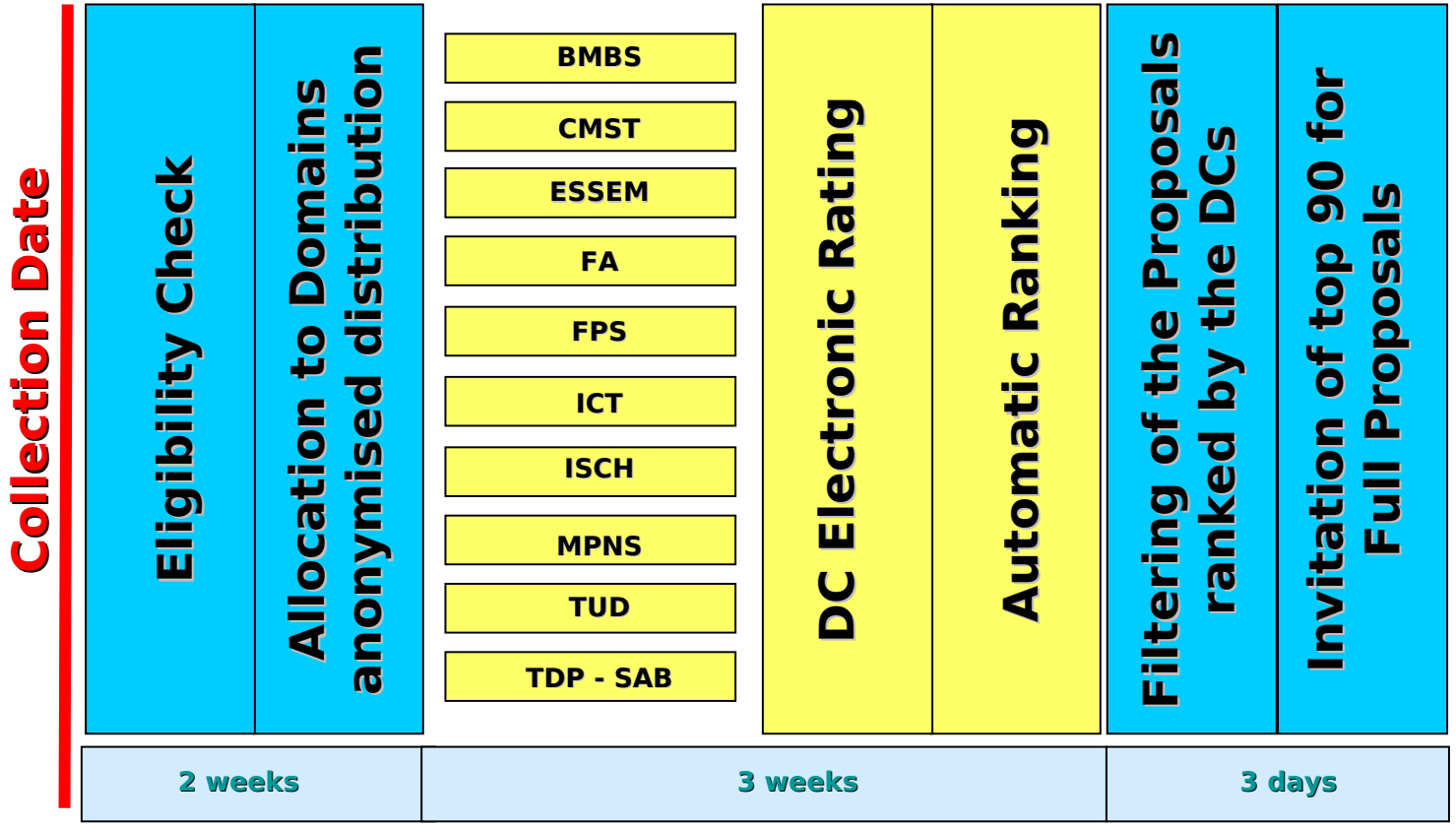
- Two collection dates per year: **60 new Actions per year**
- Next Collection Dates for pre-proposals:

  26 March 2010 and 24 September 2010
- "Open Call" = Thematically open, criteria are public
- 3-stage process results in short list recommended for funding
  - DC assessment of **pre-proposals (4-5 p.; 10-20 %)**
  - Peer reviewed evaluation of **full proposals (20-30 p.; 50 %)**
  - DC **hearings**
- Successful COST Actions proposals can expect to start activities within 9-12 months after the collection date

http://www.cost.esf.org/participate/open_call

COST Open Call process

Selection process – Preliminary Proposals (Step 1):



Minimum time span

"CD6"	27-03-2009	15-04-2009		13-05-2009	15-05-2009
"CD7"	25-09-2009	08-10-2009		06-11-2009	13-11-2009

Dates

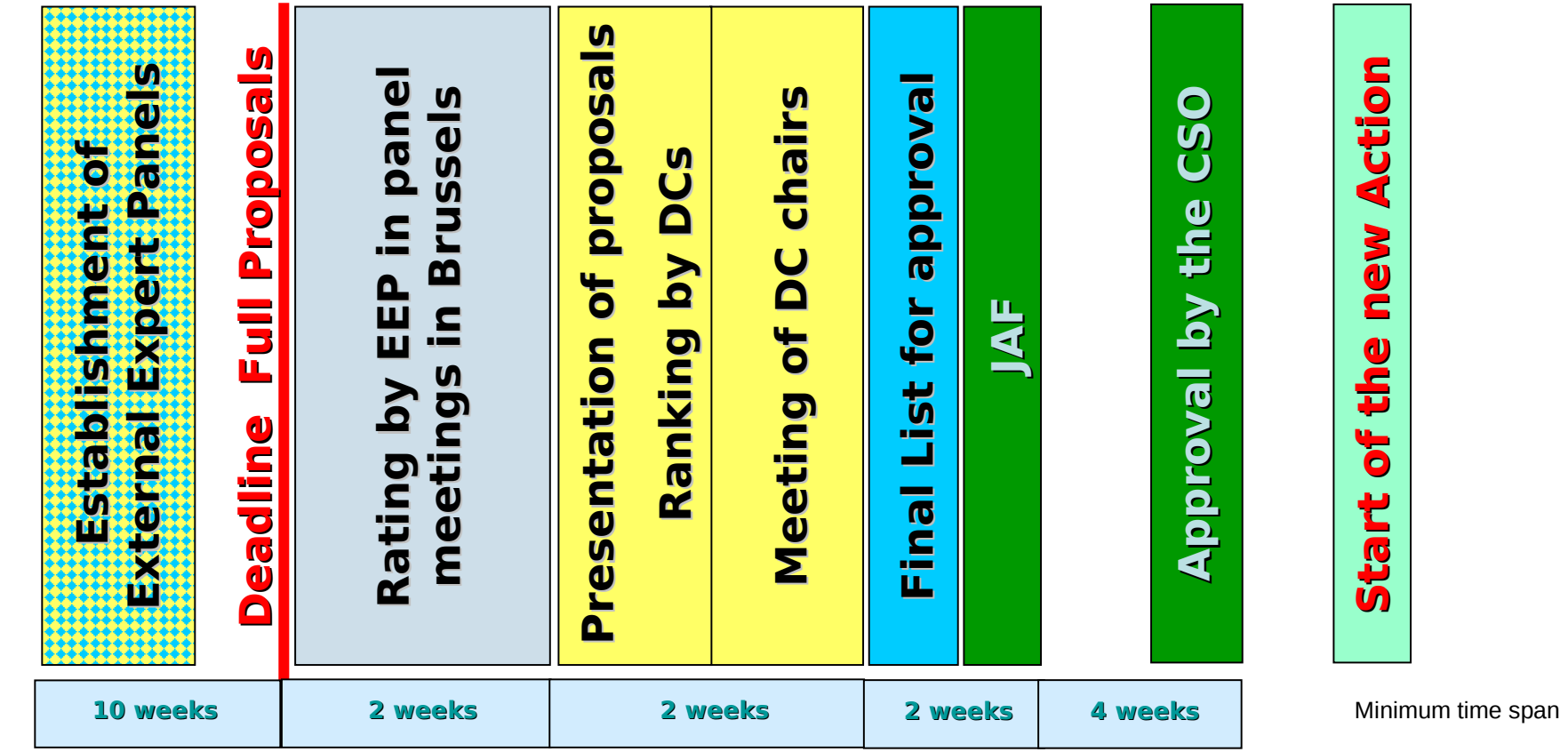
COST Open Call

Assessment criteria – Preliminary Proposals:

I.1	RIGHT FOR COST? **Is COST the best mechanism for achieving the Action's objectives?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS LOW SCORES IN THE FOLLOWING CRITERIA	yes no ❒❒❒❒ 4 3 2 1
I.2	SCIENCE **Does the proposed Action address real current problems/ scientific issues?**	yes no ❒❒❒❒ 4 3 2 1
I.3	INNOVATION **Is the proposed Action innovative?**	high low ❒❒❒❒ 4 3 2 1
I.4	IMPACT **Would the proposed network make a significant difference in terms of knowledge, capacity building, social impacts, etc?**	yes no ❒❒❒❒ 4 3 2 1
I.5	PRESENTATION **Is the proposed Action presented in a clear and understandable way?**	yes no ❒❒❒❒ 4 3 2 1

COST Open Call process

Selection process – Full Proposals (Step 2):



COST Open Call

Assessment criteria – Full Proposals:

A	**CRITICAL CRITERIA**	
A.1	**IS THIS RIGHT FOR COST NETWORKING OF EUROPEAN NATIONAL RESEARCH TEAMS? Is COST the right funding mechanism for achieving the proposal's objectives?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS REJECTION	❒❒❒❒ 4 3 2 1
A.2	**IS THE PROPOSAL PRESENTED IN A CLEAR, CONVINCING, AND APPROPRIATE WAY?** A SCORE OF 2 OR 1 AUTOMATICALLY TRIGGERS REJECTION	❒❒❒❒ 4 3 2 1
B	**SCIENCE**	
B.1	**Does the proposed Action address real current problems/scientific issues?**	❒❒❒❒ 4 3 2 1
B.2	Does the proposed Action show awareness of the state-of-the-art of the relevant scientific/ technical fields?	❒❒❒❒ 4 3 2 1
B.3	Is the proposed Action innovative?	❒❒❒❒ 4 3 2 1
C	**IMPACT**	
C.1A	If the proposed Action aims primarily to meet European economic or societal needs, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.1B	If the proposed Action aims primarily to contribute to the development of the scientific or technological field, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.1C	If the proposed Action aims BOTH to meet European economic or societal needs, AND to contribute to the development of the scientific or technological field, how likely is it to achieve useful impacts?	❒❒❒❒ 4 3 2 1
C.2	Are there clear plans for stimulating the production of high quality outputs?	❒❒❒❒ 4 3 2 1
C.3	Is attention given to the potential application of results (including, where appropriate, fostering their commercial exploitation)?	❒❒❒❒ 4 3 2 1
D	**STRUCTURE AND ORGANISATION**	
D.1	Are the workplan and organisation appropriate?	❒❒❒❒ 4 3 2 1
D.2	Are the time schedule and the setting of milestones appropriate?	❒❒❒❒ 4 3 2 1
D.3	Are appropriate plans made for monitoring and evaluating the achievement of objectives?	❒❒❒❒ 4 3 2 1
E	**CONTRIBUTION TO WIDER COST GOALS**	
E.1	How well does the proposed Action aim to involve early stage researchers?	❒❒❒❒ 4 3 2 1
E.2	How well does the proposed Action aim at gender balance?	❒❒❒❒ 4 3 2 1
E.3	Will the proposed Action attract interest from a wide range of European countries?	❒❒❒❒ 4 3 2 1

How to join an on-going COST Action?

- Visiting the website:

  http://www.cost.esf.org/participate/join_action

- Contacting the Science Officers of ESSEM:
  - Dr Stefan Stueckrad, sstueckrad@cost.esf.org
  - Dr Carine Petit, cpetit@cost.esf.org

www.cost.esf.org