COST- European Cooperation in the Field of Scientific and Technical Research

A Network of Networks for the ERA

COST-ESF Workshop on "Coastal Model Validation"
18-20 November 2009
IFREMER, Brest, France

COST is supported by
the EU RTD Framework Programme

ESF provides the
COST Office through an EC contract

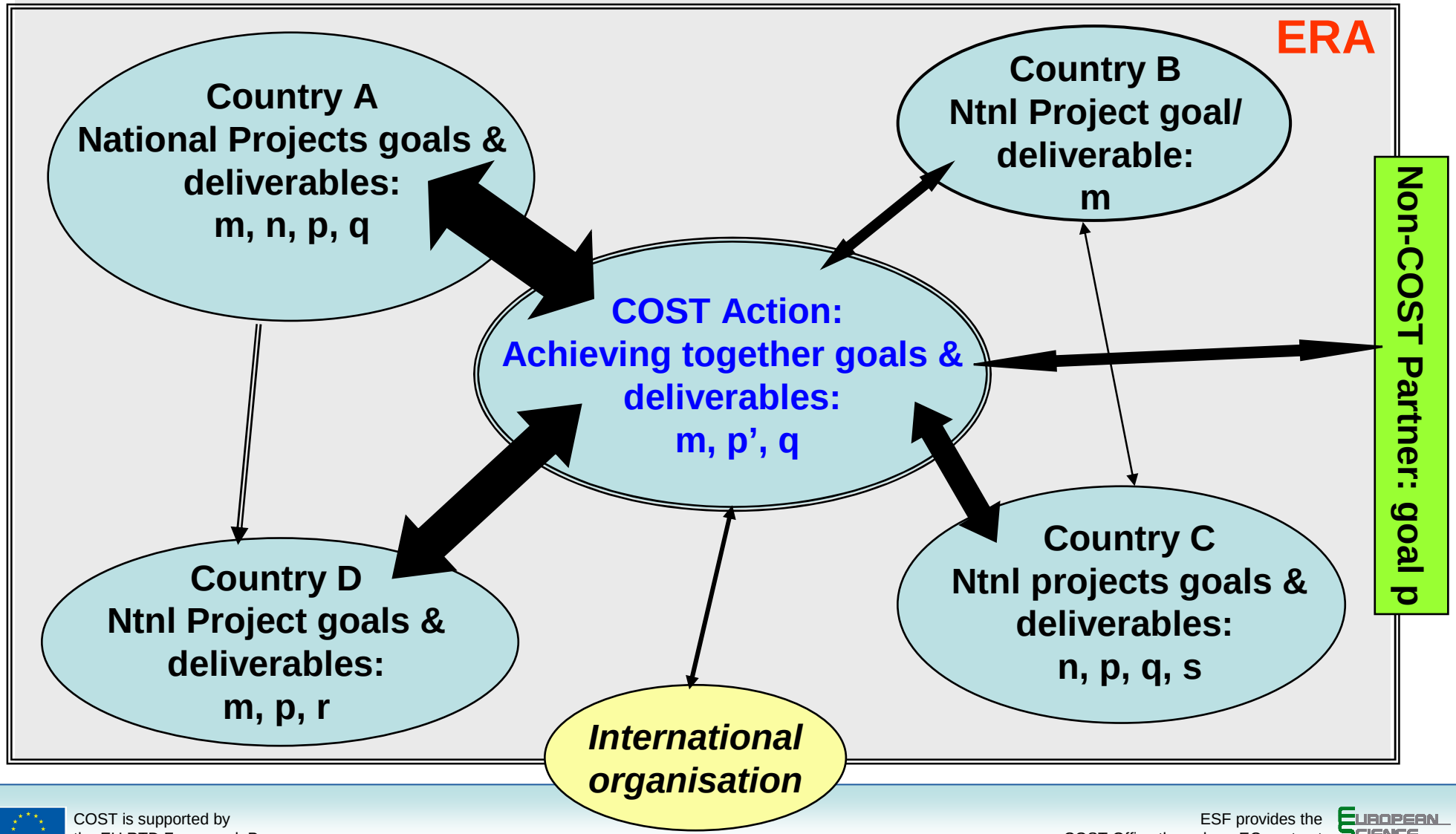
The COST mission

"Strengthen European scientific and technical research through the support of cooperation and interactions between European researchers"

Longest running and widest European intergovernmental network for cooperation in research established by a Ministerial Conference of 19 European States in 1971

COST does not fund research itself but networking activities

Allying/Pooling National Projects into a COST Action



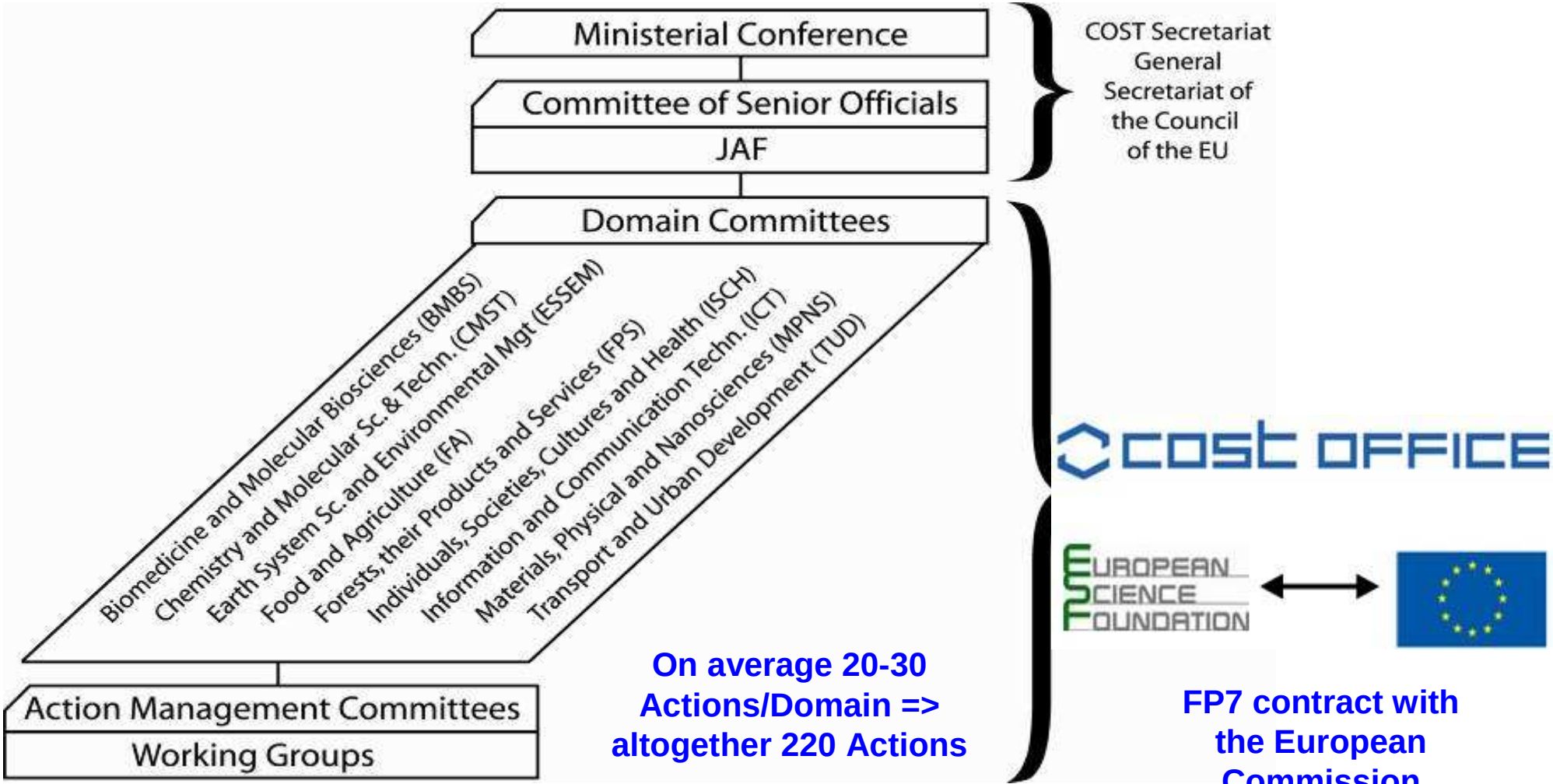
COST Main Characteristics

- "**Bottom-up**": initiative from researchers, no pre-defined programmes/priorities, equal access => **Exploratorium** of new ideas.
- **Basic & pre-competitive research** as well as activities aiming at public utilities. Multi-disciplinarity.
- **Flexible** "à la carte" participation, but broadly pan-European >20 MS
- Open to **global cooperation** based on mutual benefits
- Specific support for Early Stage Researchers (PhD + <10 yrs)

Actions = "Acting Networks" allying nationally funded **projects** from at least 5 countries => national responsibility & coordination:

=> Joint objectives; Work-load sharing; Concrete deliverables (not discussion club); Coordination; Synergising; Leaving long-lasting impacts after the Action; Advancing the research agenda; Leverage effect; Capacity building; ESRs to the front scene; …..

COST Governance and Partnership



COST Scientific & 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)

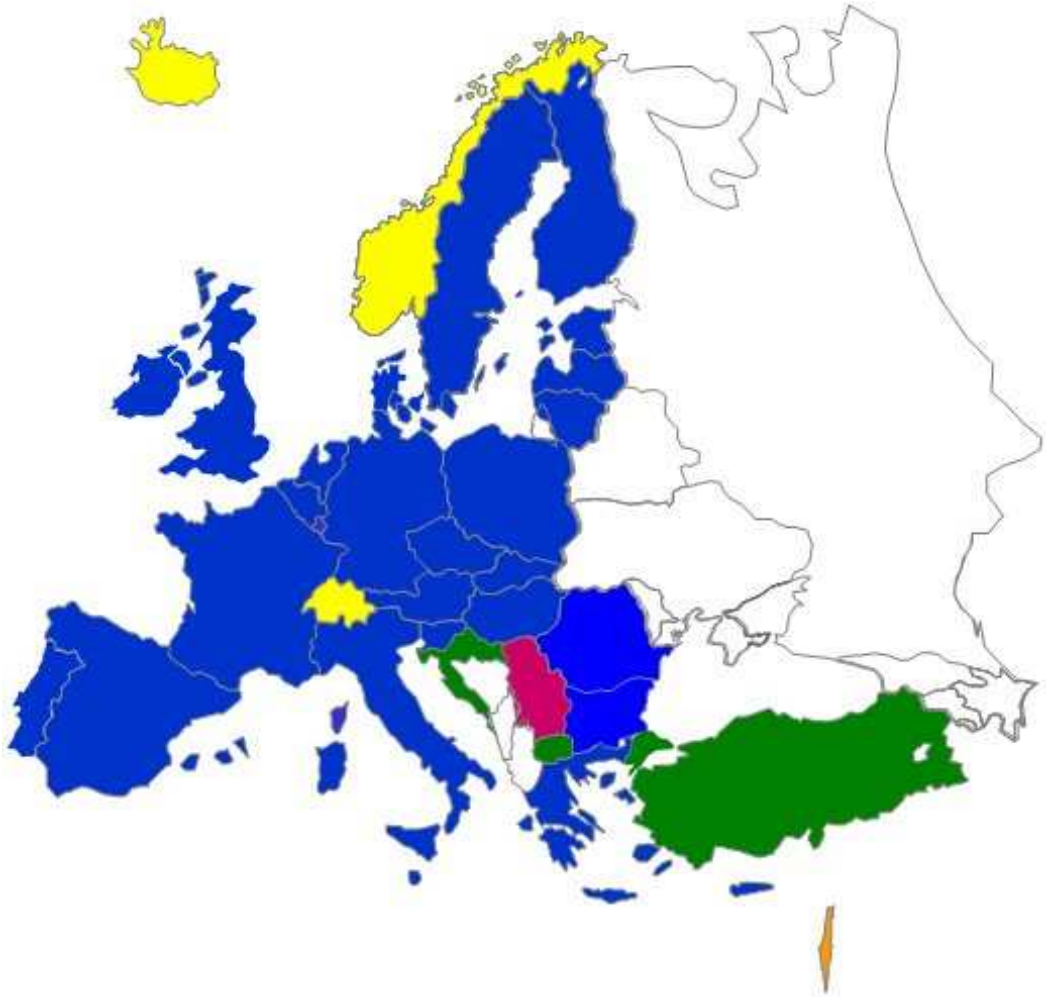
+ Special route for Trans-Domain proposals

The role of the Domain Committees (DCs)

- **Assessment** of submitted proposals in the Open Call
  - Reviewing and rating of Preliminary Proposals vs. 5 open criteria
  - Hearing and ranking of Full Proposals selected by EEP
- **Monitoring** of Actions in progress
  - **Rapporteur** allocated for each Action from the DC + Annual hearings
- **Evaluation** of completed Actions
  - Peer review by an Evaluation Panel

The COST Open Call:

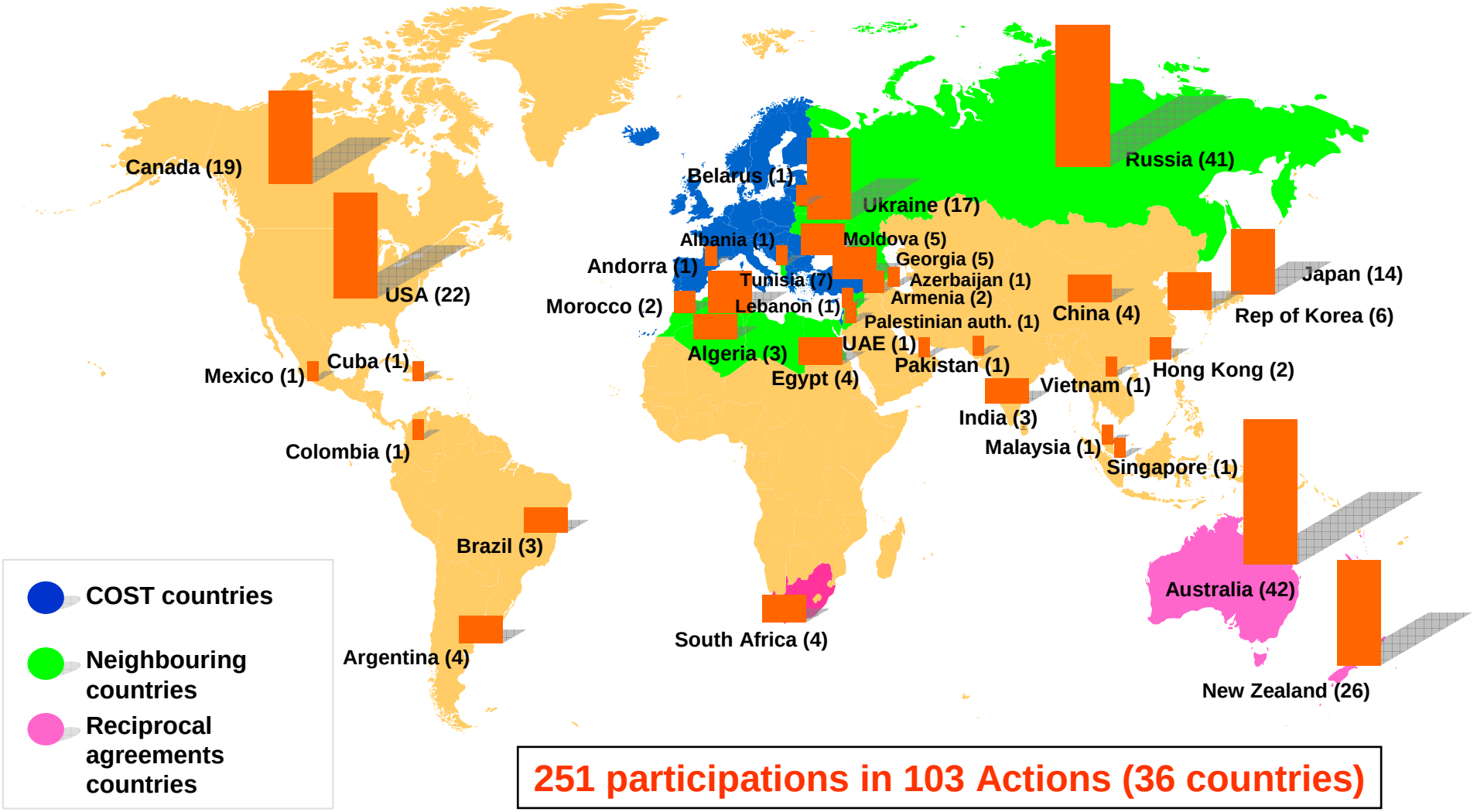
- Two collection dates per year (end of March and September) => **26/03/2010**
- 2-stage process:
  1. Pre-proposals (3 pages: user-friendly) => 10-20% selected
  2. Full proposals (25 pages) > External Peer Review Panel => 25-40%
- Successful COST proposals can expect to start activities **within 9 months** after the collection date.



COST = 35 + 1 countries

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

COST Actions: global participation (status: May 2009)



251 participations in 103 Actions (36 countries)

Actions run through a Management Committee (MC)

- **The Action MC:**
  - **Supervises & coordinates the implementation of the Action;**
  - **Promotes and disseminates results;**
  - **Liaises with stake-holders**
  - **Integrates and steers scientific work carried out in 3-5 WGs (WPs)**
  - **Selects Early Stage Researchers to perform intra-COST visits**
- **MC composed of:**
  - **Maximum 2 representatives of each party**
    - **Ensuring the scientific coordination at national level**
    - **More national scientists involved through the WGs**
  - **Representatives of any non-COST institution**
  - **Observers and Invited experts**

What is funded by COST?

- **COST supported by a specific budget line of EU FP7 (2007-2013): at least 210 M€ and up to 250 M€ (mid-term evaluation in 2010)**

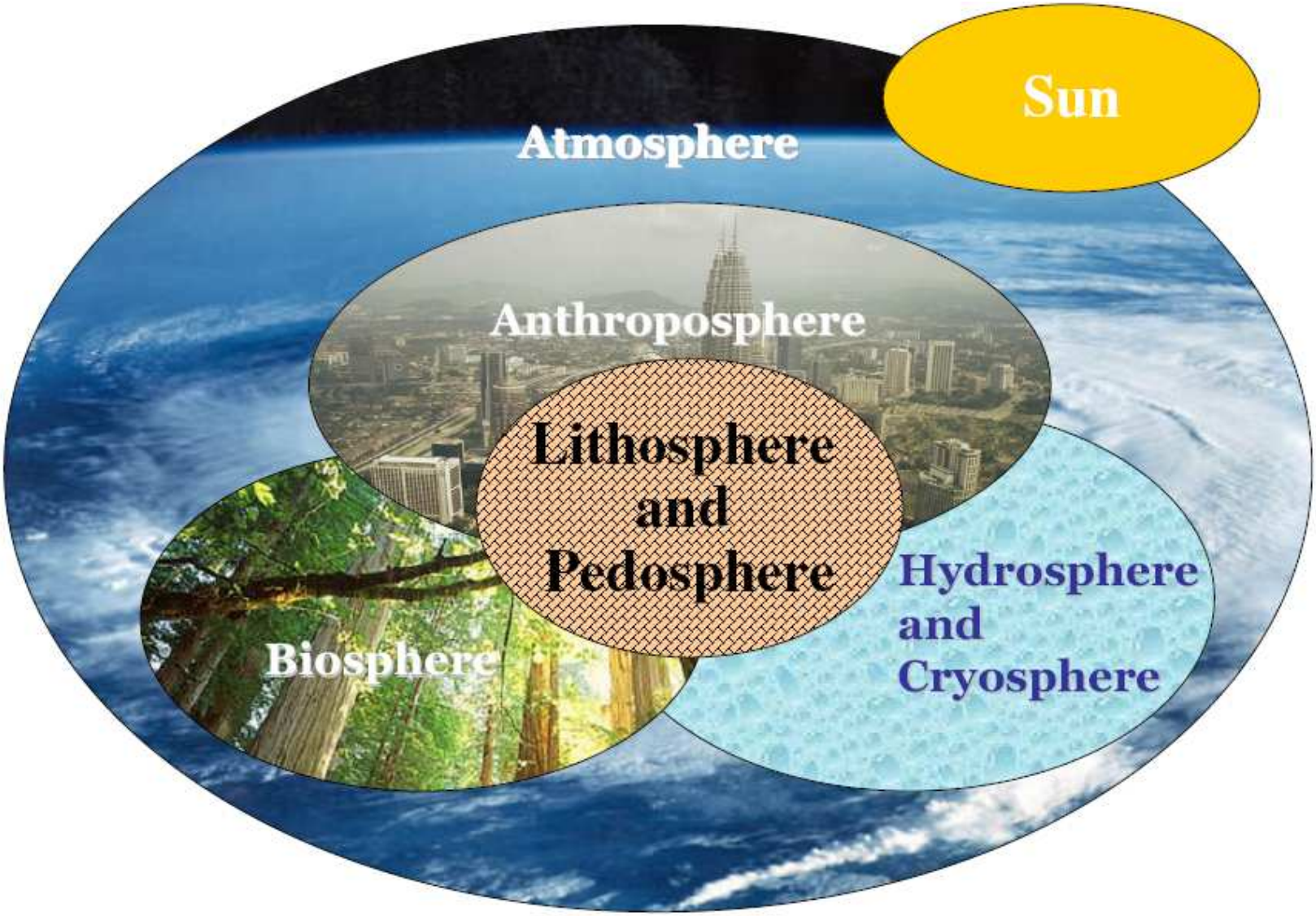
- **COST Actions receive a financial contribution based on a joint Work Programme for:**
  - **Science management meetings**
  - **Scientific workshops and seminars**
  - **Short Term Scientific Missions (STSMs): mobility interactions, ESRs**
  - **Training Schools and Research Conferences**
  - **Dissemination, publications**

  Average funding about 100 000 € per year per Action

- **COST (DCs, CSO) can organise ad-hoc Exploratory/Strategic/Frontiers of Science Conferences/Workshops: to explore future scientific or societal needs, support policy developments or initiate new activities.**

  + Joint synergy initiatives with ESF (this workshop)

ESSEM Domain: ~2,5 M€ / yr

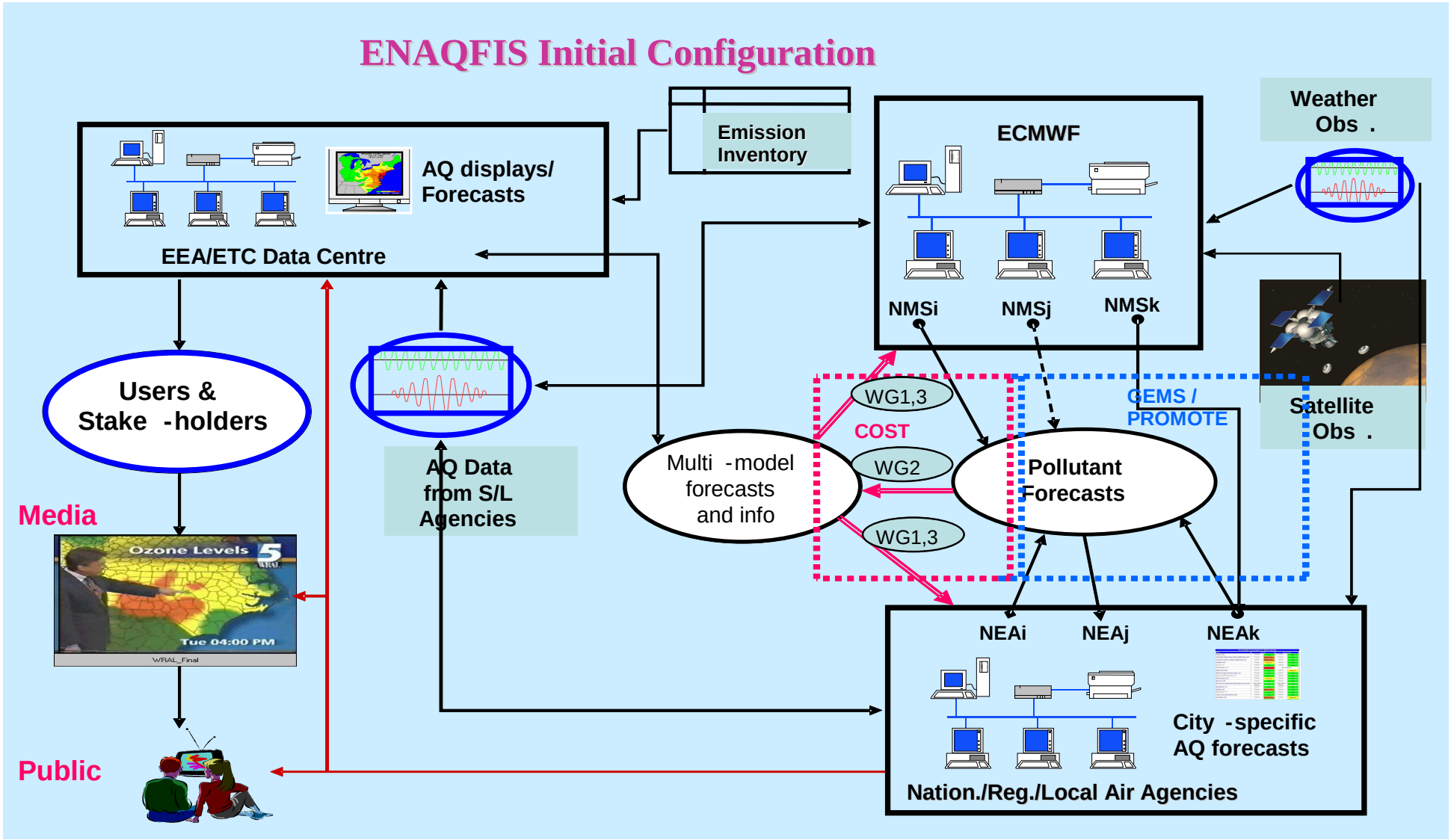


Some Strategic Achievements and Successes

- **First Success Story: COST Action 70 lead to the creation of ECMWF (European Centre for Medium-Range Weather Forecasts)**
- **5 COST Actions (72-73-76-716-717)** developed **data transfer standards,** which through partnership with **WMO, became global standards (radar, wind-profilers, GPS) => EUMETNET Programmes (OPERA, WINPROF, E-GVAP)**
- **COST 713 => Harmonised global UV-index (with WMO, WHO)**
- **COST 40: European sea level observing system**
- **COST 43: Experimental European network of ocean stations**
- **COST-725 => EUMETNET/PEP-725 + GEO US-09-03d Global Phenology**
- **COST-611: set the bases for including Environmental R&D themes into FP3**
- **COST Actions** = Often forum for launching successful **EU-FP proposals,**
- Many strategic first steps in various R&D Disciplines, e.g.:

  Road traffic aid system for adverse weather conditions ; 1st GSM standards ;

  Standards for low-floor buses ; Green Chemistry; …
- More info: Joffre S.M., WMO Bulletin, No.51(2) April 2002, p. 150-155.



COST ES0602: Contribution to an European architecture for an Air Quality Forecasting and Information System Network of networks, based on NMSs and NEAs capacities. The double red arrows depict still missing connections addressed by the COST Action.

COST ES0702 (EG-CLIMET): European Ground-Based Observations of Essential Variables for Climate and Operational Meteorology (> Nov. 2012)

- **Proposal coordinated by the president of the WMO Commission for Instruments and Methods of Observation (CIMO)**
- **Main objective**: **Specification, development and demonstration of cost-effective ground-based integrated profiling systems suitable for future networks providing essential atmospheric observations for both climate and weather.**
  - Atmospheric observing systems for GEOSS/GMES in Europe will be integrated to satisfy requirements for climate, environment and security.
- Action will coordinate deployment and further development of integrated ground-based remote sensing systems to provide key atmospheric variables (clouds, winds, temperature and humidity).
- Several HMEI (*Association of Hydro-meteorological Equipment Industry*) members represented in Working Group 1- Instrumentation.
- Interactions with EUMETNET EUCOS

ESSEM Portfolio of ongoing Actions (1/3):

Climate Change

- ES0601 - Advances in homogenisation methods of climate series: integrated approach => IPCC, CLIPS
- ES0604 - Atmospheric Water Vapour in the Climate System => SPARC, GCOS, IGACO
- ES0902 - Permafrost and Gas Hydrate related CH4 Release in the Arctic and Impact on Climate Change: European Cooperation for Long-term Monitoring => IGLO, GOSAT
- ES0907 - INTegrating Ice core, MArine and TErrestrial records (60,000 to 8000 years ago)

Observing Systems and Networks

- (727 - Measuring and forecasting atmospheric icing on structures)
- ES0702 - European ground-based observations of essential variables for climate and operational meteorology => EUCOS, ISOWG, THORPEX, GMES
- ES0802 - Unmanned Aerial Systems (UAS) in Atmospheric Research
- ES0903 - Spectral Sampling Tools for Vegetation Biophysical Parameters and Flux Measurements
- ES0906 - European Gliding Observatories Network – EGO.

Meteorology

- 733 - Harmonisation and applications of weather types classifications for European Regions
- ES0904 - Basic Concepts for Convection Parameterization in NWP and Climate Models

ESSEM Portfolio of ongoing Actions (2/3)

Air Quality

- 728 - Enhancing meso-scale meteorological modelling capabilities for air pollution and dispersion applications => WMO/GURME
- ES0603 - Assessment of production, release, distribution and health impact of allergenic pollen in Europe => MACC, PROMOTE, GEO/US-09-03d
- ES0602 - Towards a European Network on chemical weather forecasting and information systems => GMES (GEMS/MACC, PROMOTE), WMO/GURME

Biosphere, Ecology

- ES0805 - The Terrestrial Biosphere in the Earth System => iLEAPS, FluxNet, FLEX, COCOS, QUEST, US-NCEAS, US-NESCent
- ES0905 - Seagrass productivity: from genes to ecosystem management

Marine Sciences

- 735 - Tools for assessing Global air–sea fluxes of climate and air pollution relevant gases => SOLAS, WCRP
- ES0801 - Ocean chemistry of bioactive trace elements & paleoclimate proxies => GEOTRACES/SCOR, IMBER, SOLAS

Hydrology

- 731 - Propagation of uncertainty in advanced meteo-hydrological forecast systems
- ES0901 - European Procedures for Flood Frequency Estimation

ESSEM Portfolio of ongoing Actions (3/3)

Biogeochemical Cycles

- ES0804 - Advancing the integrated monitoring of trace gas exchange between biosphere and atmosphere => ILEAPS, ICOS, GEOLAND
- ES0806 - Stable Isotopes in Biosphere-Atmosphere-Earth System Research

Environmental Management

- 729 - Assessing and Managing Nitrogen Fluxes in the Atmosphere-Biosphere System in Europe => UN-ECE/CLRTAP (New Task Force on Reactive Nitrogen)
- 638 - Investigating and managing the impacts of marine sand and gravel extraction and use
- 734 - Impacts of climate change and variability on European agriculture => WMO

Space Research

- ES0803 - Developing space weather products and services in Europe => ESA

Geodesy

- ES0701 - Improved Constraints on Models of Glacial Isostatic Adjustment <=> GRACE

Water Quality and Waste Waters

- 636 - Xenobiotics in the urban water cycle
- 637 - Metals and Related Substances in drinking water
- TD0803 - Detecting evolutionary hot spots of antibiotic resistances in Europe

Soil Sciences

- 639 - Greenhouse gas budget of soils under changing climate and land use

COST ESSEM assets towards impactful initiatives

- COST ESSEM DC = 30 national delegates with expertise covering various aspects of Earth System and Environmental Science including **Oceanography, Meteorology, Atmospheric Sciences, Hydrology, Ecology and Earth Observation & Remote Sensing**
- Permanent Observers from: **WMO, EUMETNET, EC/DG-Res, EEA, EMS**

  => Efficient exploitation and transfer of COST results to wider forums

  => WMO assigns dedicated contact persons within its administration for all relevant COST Actions => interactions & coordination (e.g., WMO Inter-comparison campaigns, mutual exchange of experts)

  => Several COST Actions became EUMETNET Programmes, thus enabling full development from science to operationality.
- Several ESSEM Actions have direct activities supporting **WMO** objectives.
- COST Actions concern grossly all **9 GEO Societal Benefit Areas**
- Partnership with **HMEI** (Association of Hydro-meteorological Equipment Industry)
- COST Actions have a wide participation basis => easy reach-out, wide consensus & application coverage
- Ad-hoc Cooperation (+ coordination) with other organisations: **ITU, WHO, UNESCO-IOC, FAO, EUMETSAT, ESA, ECMWF, EC (JRC, EEA, GMES, DG-Env)**

Thank you for your attention!

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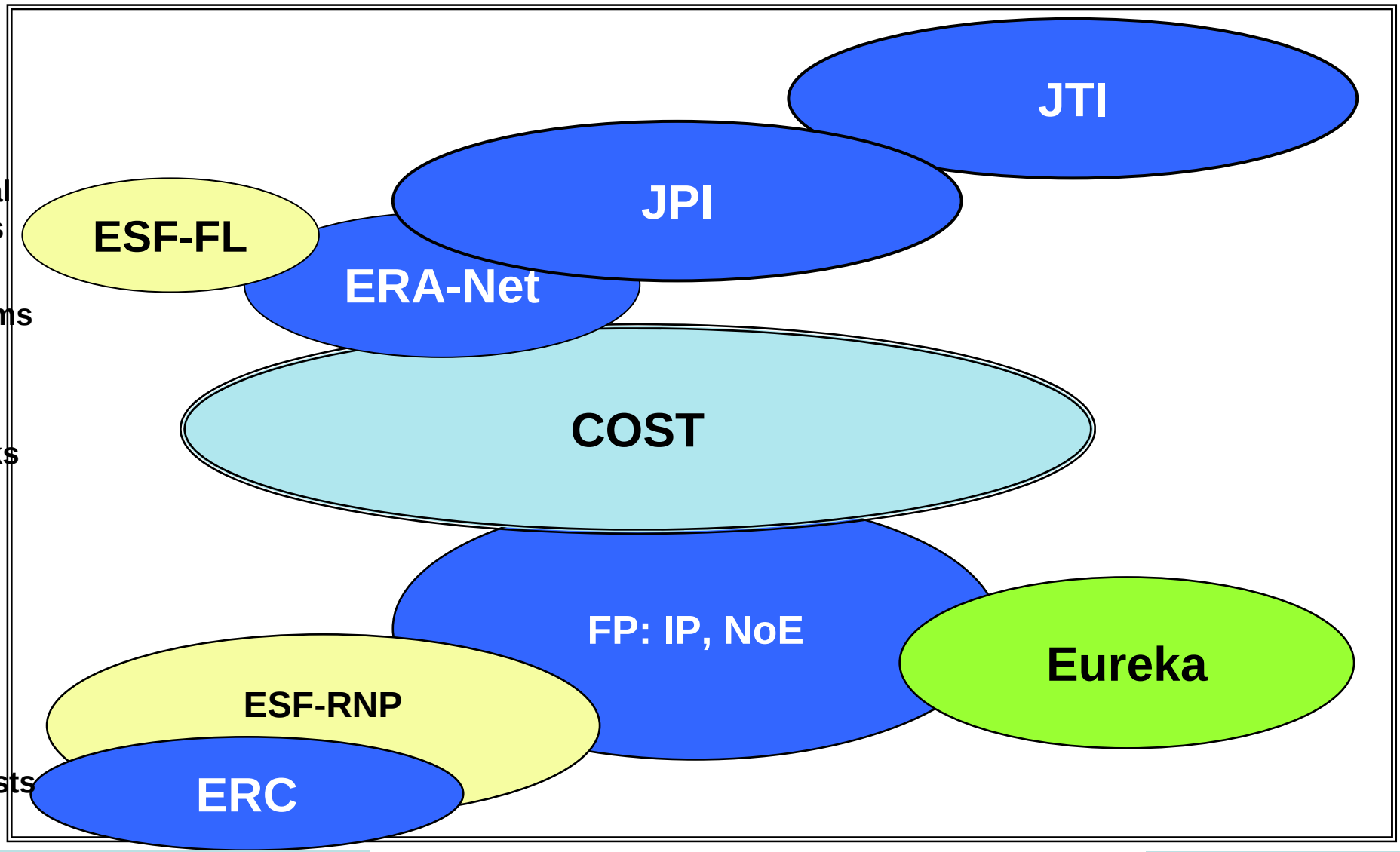
European R&D Schemes stratified according to: Basic vs. Applied research + Hierarchy of Integration

- Lead Markets
- Societal Drivers
- Programs
- Project Networks
- Issues
- Topics
- Scientists



Basic academic research | Applied R&D | Societal Applications | Markets

Applications of phenological data: climate change trends in IPCC 4th Assessment Report (2007)

US-09-03d

Global Phenology Data

UIC

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).

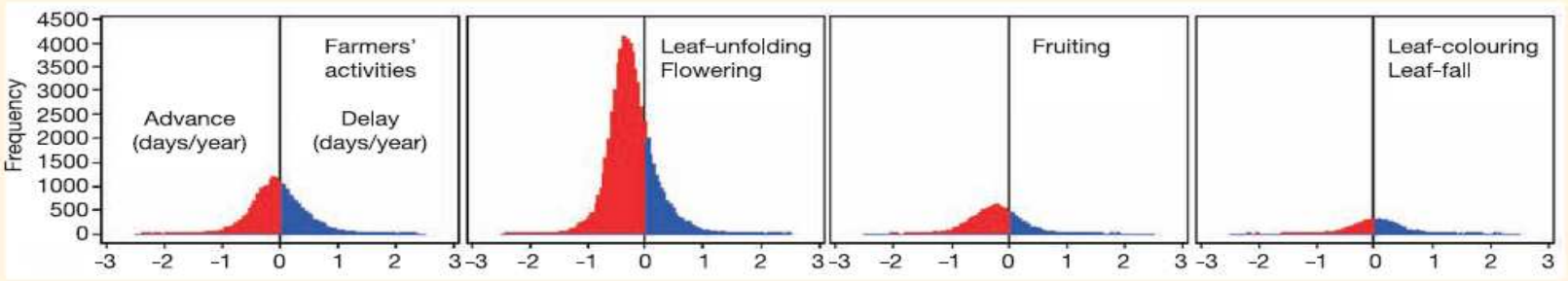


Figure 1.6. *Frequency distributions of trends in phenology (in days/year) over 1971 to 2000 for 542 plant species in 21 European countries. From Menzel et al. (2006b).*

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)

76 participations in 36 Actions