

GEMS: *Global Earth-system Monitoring
using Space and in-situ data*

Introduction to GEMS 2006 Assembly

A.Hollingsworth

*GMES Integrated Project,
12.5MEuro, 30 Institutes, 14 Countries
www.ecmwf.int/research/EU_projects/GEMS*

Scope of this Presentation

- **Goals of the Assembly**
 - Progress & Planning in Plenary & Parallel Sessions
 - Contractors Committee
 - Board Meetings, following the main part of the Assembly
 - Schedule of GEMS work 2005-2009
 - Schedule for Global System, March 2006-August 2007
- **Outreach**
 - GCOS
 - GEOLAND_Next /Global
 - IASI launch, June 2006
 - NASA/OCO
- **A Forward Look:**
 - EU Plans for Framework 7
 - Preparation of a GMES Atmospheric Service (2009-)

Goals of the Assembly

- Report progress, and obstacles to progress
- Review the mandatory reporting requirements
 - Activity reports
 - Management Reports & Auditing
 - The unpleasant consequences of unsatisfactory reporting
- Review the overall plan and the detailed sub-project plans
- Resolve cross-cutting issues in the plan

GEMS: *Progress & Planning in Plenary & Parallel Sessions*

- Delays in contract signature led to a diffuse start
- Nevertheless the GEMS project is up, and running fast
- Many thanks to WMO and to the Space agencies

Greenhouse Gases	P Rayner
Reactive gases	G.Brasseur / M.Schultz
Aerosol	O.Boucher
Production system	A Simmons
Regional Air Quality	V-H.Peuch

GEMS: *Contractors Committee Agenda*

12.15 Tuesday

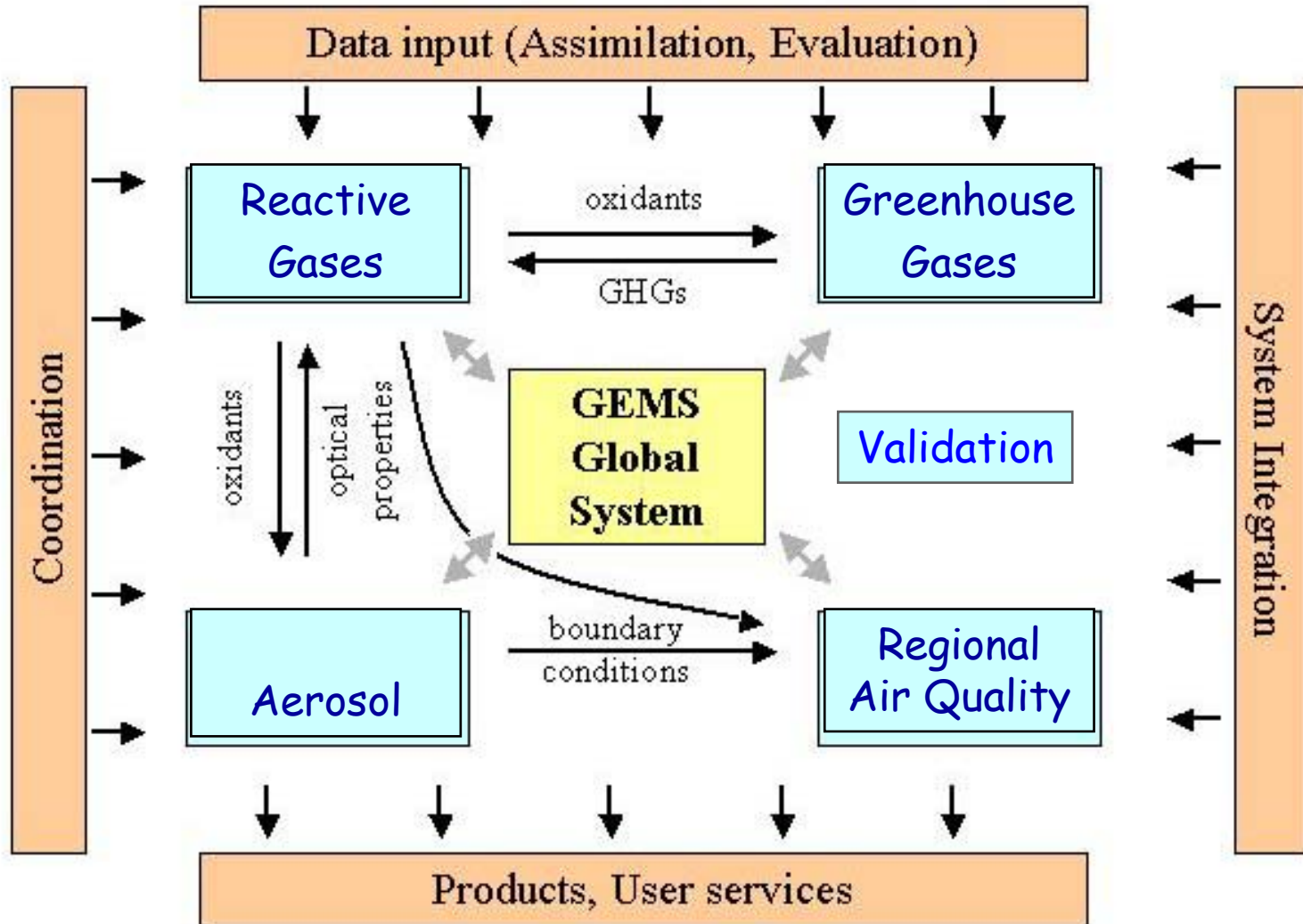
1	Coordinator	Progress on Contract changes proposed at Hamburg
2	Coordinator	Rearrangement of Work between KNMI and ECMWF
3	Coordinator	Rearrangement of Work between MPI-Hamburg and Forschungszentrum Julich - New Partner
4	P.Breger, CEC	Reporting Requirements for Integrated Projects

*GEMS: Board Meetings,
following the main part of the Assembly*

Thursday 1330-1730	GEMS Advisory Board (IGACO, WCRP, PROMOTE-2, CarboEurope, EEA, ESA, EUMETSAT, CNES, DLR)
Thursday 1330-1530	GEMS_Regional Air Quality: User advisory Board ADEME (Fr), UBA(D), UBA(At), SMHI (SE), INM (E)
Friday 0900-1730	GEMS Management Board

Organisation of the GEMS Project

GEMS is organised in 6 projects



Four-Year Schedule of GEMS work at ECMWF

Year 1 May 2005 - April 2006	<ul style="list-style-type: none">• Build and validate 3 separate assimilation systems for Greenhouse gases, Reactive gases, Aerosol.• Acquire data; build web-site
Year 2 May 2006 -April 2007	<ul style="list-style-type: none">• Produce 3 different reanalyses for GHG, GRG, Aerosol• Make reanalyses available for validation by all partners• Provide feedback to data providers
Year 2-2.5 May 2007 -Oct 2008	<ul style="list-style-type: none">• Merge the 3 assimilation systems into a unified system;• Upgrade the models and algorithms based on experience
Year 2.5-3.5 Nov 2007 - Oct 2008	<ul style="list-style-type: none">• Build operational system, & interfaces to partners• Produce unified reanalyses for GHG, GRG, Aerosol
Year 3.5 - 4 Nov 2008 - May 2009	<ul style="list-style-type: none">• Final pre-operational trials• Documentation & Scientific papers

Plans for Global System March 2006-August 2007

	MAM 2006	JJA 2006	SON 2006	DJF 2007	MAM 2007	JJA 2007
Greenhouse Gases						
Aerosol						
Reactive Gases						
	Build three 4D-VAR Assimilations		3 Separate Reanalyses			Upgrade & Unify

GEMS Outreach

- **GCOS Steering Committee, Thirteenth Session, 5-8 October 2005, St Petersburg, Russian Federation**
 - [CONSOLIDATED LIST OF CONCLUSIONS](#),
 - [RECOMMENDATIONS AND ACTION ITEMS](#)
 - [Atmospheric Observation Panel for Climate \(AOPC\)](#)
 - The GCOS Steering Committee welcomed the plans and progress of the GEMS project ('Global Earth-system Monitoring using Satellites'), aimed at developing a real-time operational assimilation and forecast capability of aerosols, greenhouse gases and reactive gases and being funded by the European Union and coordinated by ECMWF. The Committee encouraged the AOPC to investigate the use of the results of such projects to refine the global observation requirements for atmospheric constituents.
- **GEOLAND_Next /Global**
- **IASI launch, June 2006**
- **Welcome today to the PIs of NASA's OCO mission**

A Forward Look: EU Plans for Framework 7

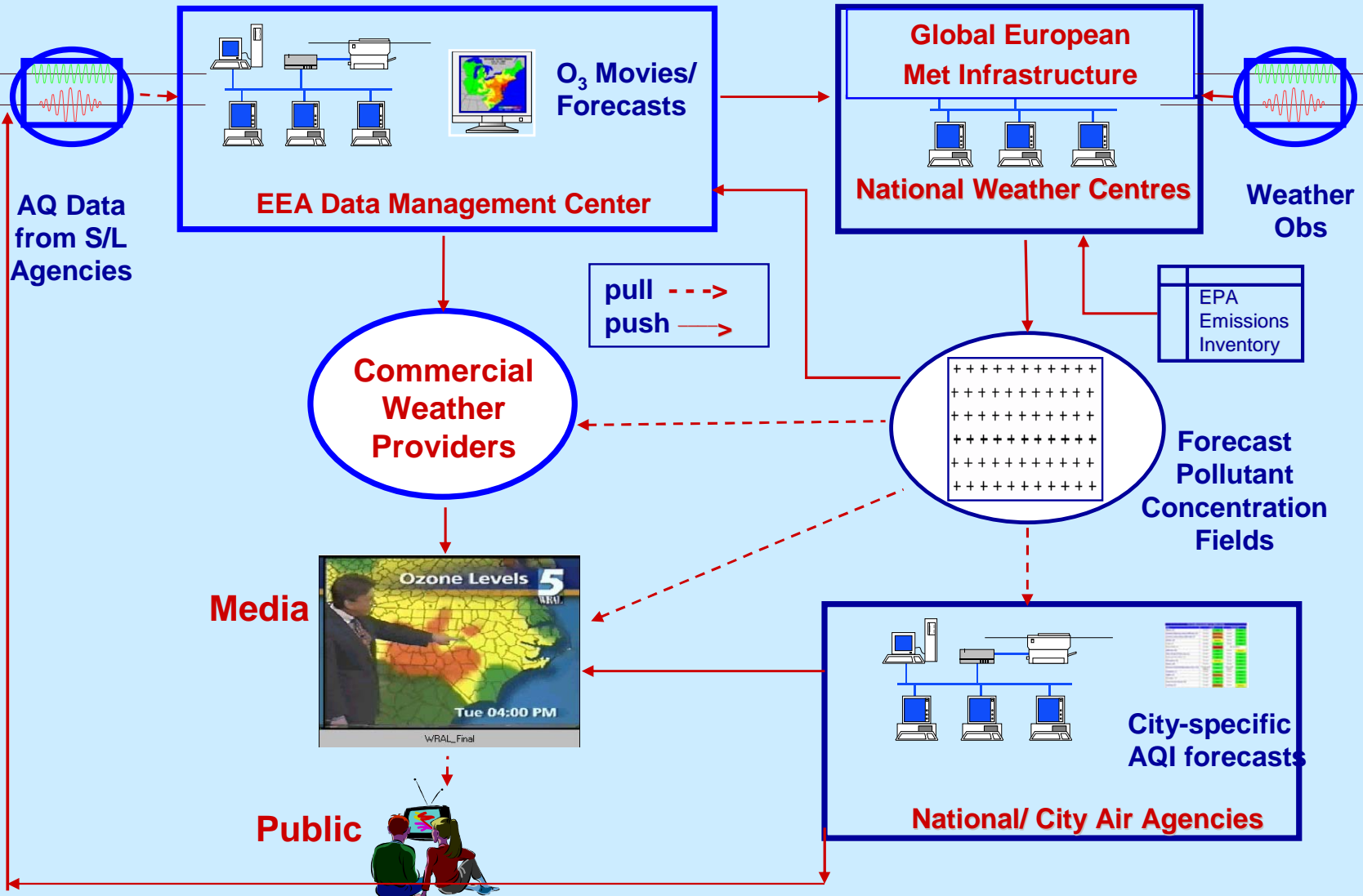
- FP_7 funding will average ~€10B per annum for 25 countries (FP6 ~ €7B for 15 countries)
- FP_7 should be announced in 2006, with the first calls in late 2006.
 - first contracts in late 2007
- FP_7 will have budget lines for
 - Climate and Environment
 - GMES
- Climate and Environment funding will probably include a strong element on chemistry & climate
- GMES funding will probably include resources for a 'GMES Atmospheric Service' to start in 2009, after completion of GEMS & PROMOTE_2

A Forward Look: Preparation of a GMES Atmospheric Service (2009-)

- Short scoping paper will be prepared by GMES Programme Office in 1st quarter of 2006, for approval by GMES Advisory Committee in April
- More detailed scoping paper to be developed in 2nd & 3rd quarters by GPO & stakeholders, for presentation at a stakeholders workshop in 4th quarter of 2006
- Possible elements of the proposal include
 - Core service
 - Downstream services
 - Greenhouse gas service
 - Real-time air quality service
 - Science service in support of GCOS, ...
 -

GAS Real Time-Service: Initial Operational Configuration

Global, European, National & City Links



Agreements needed for a real-time Air Quality element of a GMES Atmospheric Service (2009-)

- If the INSPIRE directive is delayed, multi-lateral agreements will be needed on exchanges of observations and products
- Air Quality Observations:
 - Much European real time data is published on the Web.
 - EEA is ready to help in federating real-time NEA observation delivery.
- GMES Air Quality Products for mandated authorities,
 - ECMWF products are available for national use.
 - In practice, agreements may be needed between the National Met Services (the national points of entry) and National Environment Agencies
 - EEA has indicated a willingness to be helpful in federating NEA's requirements
- GMES Air Quality Products for other parties,
 - Products available through the ECMWF catalogue for either scientific or commercial use.
 - The position will be reviewed in the next year or two

END

Thank you for your attention!

Questions?

Progress since May 2005 in the global sub-projects

- Data Issues:

- WMO involvement in Chemical Weather:- BUFR issues being worked
- Data acquisition proceeding well, with considerable cooperation from the space Agencies (ESA, EUMETSAT, NASA, NOAA)

- Modelling

- Generic capability in the model to advect many (~100) species
- In-line parametrisations implemented for Greenhouse gases & Aerosol
- Surface fluxes specified climatologically (CO₂) or dynamically (Aerosol)
- Year-long test runs with specified meteorology and free-running chemistry
- Year-long test assimilations to assess Brewer-Dobson circulation
- For reactive gases: Forecast model coupled via OASIS-4 to CTMs (Chemical Transport Models)

- 4D-VAR (Four-dimensional variational assimilation)

- Forecast error correlations assessed by Ensemble 4DVar & NCEP methods
- Generic capability implemented in 4D-Var to assimilate radiances, retrieved profiles, and total column amounts
- First assimilations being assessed