



WCRP

World Climate Research Programme

WCRP update

WDAC5, Asheville, 7-8 April 2016

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International Council for Science

Mission & Objectives



World Climate Research Programme supports **climate-related decision making** and **adaptation planning** by coordinating research required to improve

- (1) climate predictions and
- (2) understanding of human influence on climate

“for use in an increasing range of practical applications of direct relevance, benefit and value to society”

(WCRP Strategic Framework 2005-2015).

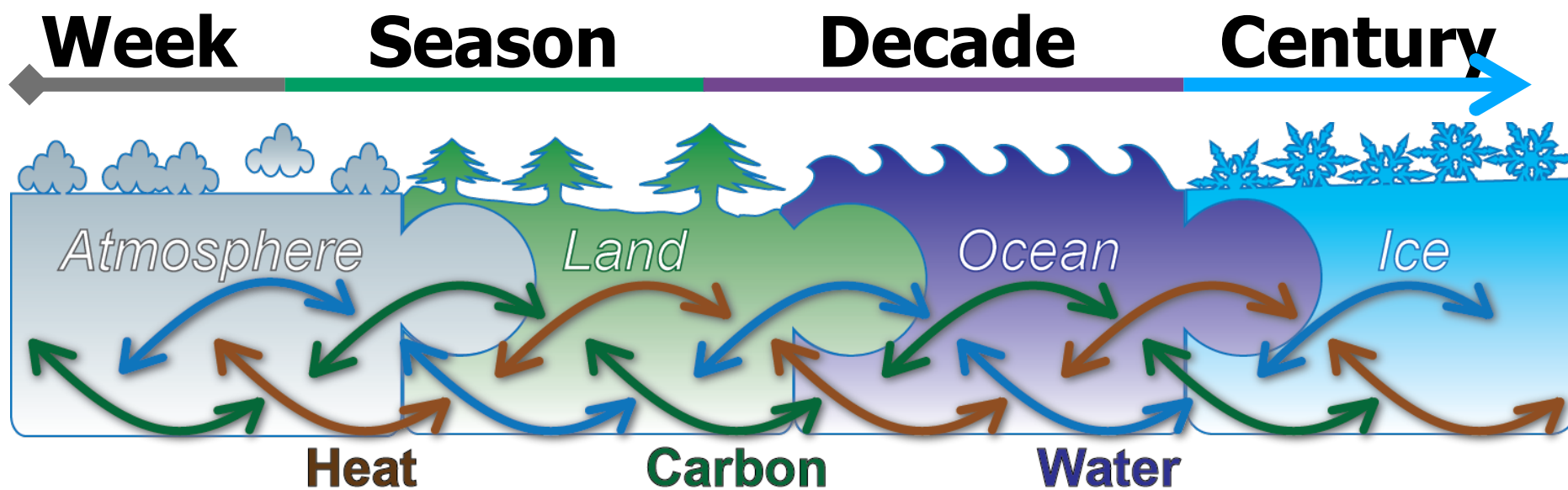
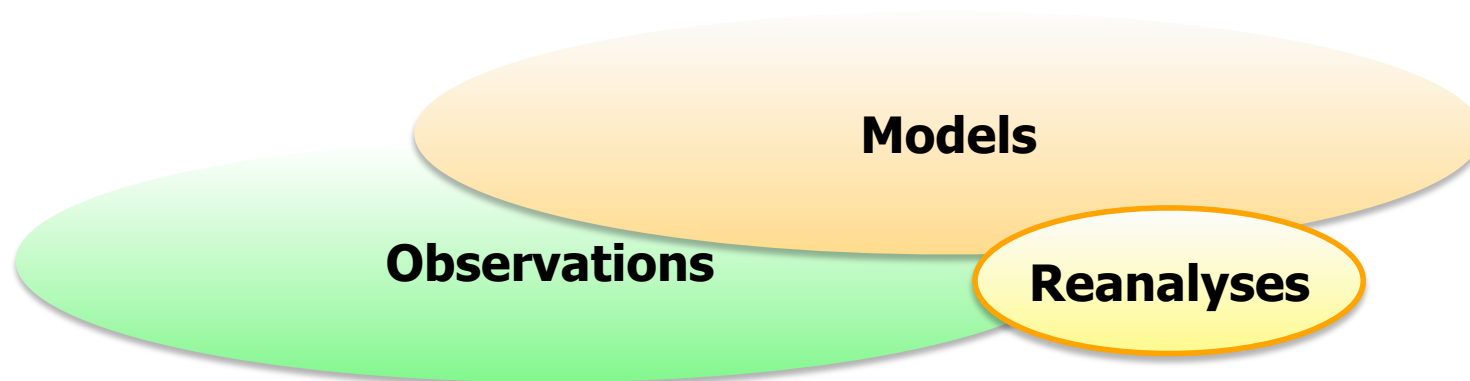


The big picture

- UNFCCC: Paris agreement, 1.5 degC aim
 - SBSTA: IG3IS
- GFCS: research, modeling and prediction
- Sendai Framework on Disaster Risk Reduction
- Expected new UN Urban Agenda
- IPCC: AR6, ocean, regional, 1.5 degC, urban

WCRP

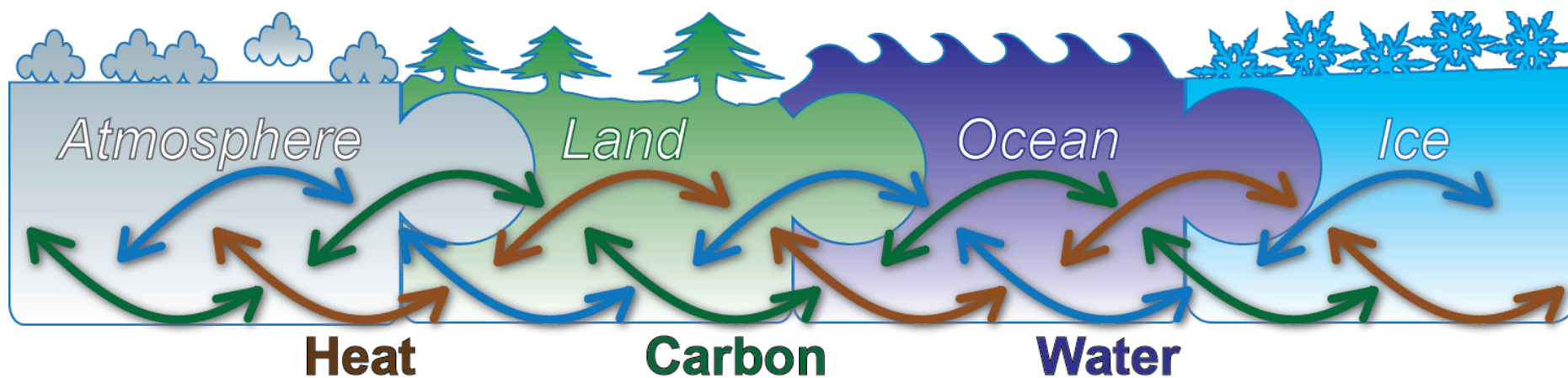
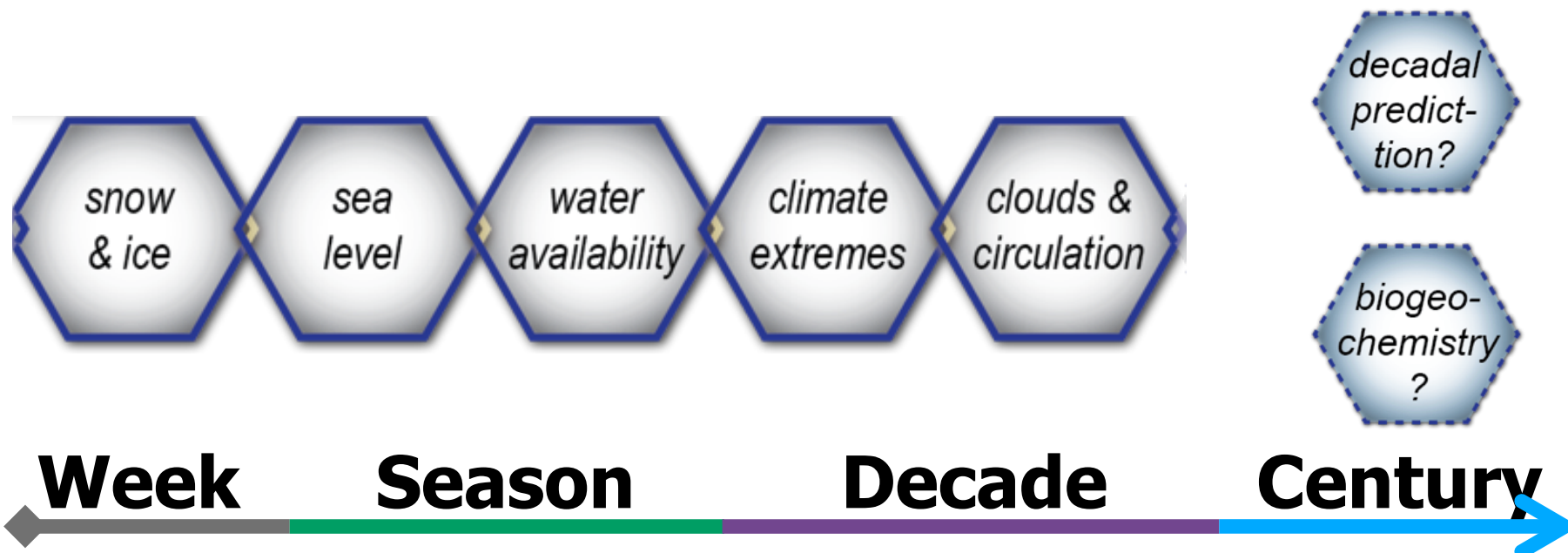
World Climate Research Programme



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Joint Scientific Committee

Joint Planning Staff

Modeling Advisory Council

Data Advisory Council

Working Groups on: Coupled Modeling (WGCM), Numerical Experiment (WGNE),
Regional Climate (WGRC), Seasonal to Interannual Prediction (WGSIP)

CLIC

CLIVAR

GEWEX

SPARC

CORDEX

Regional Sea-Level Change and Coastal Impacts

Cryosphere-
Climate

Ocean-
Atmosphere

Melting Ice and Global Consequences

Land-
Atmosphere

Troposphere -
Stratosphere

Regional
Climate
Downscaling

Changes in Water Availability

Cloud Circulation and Climate Sensitivity

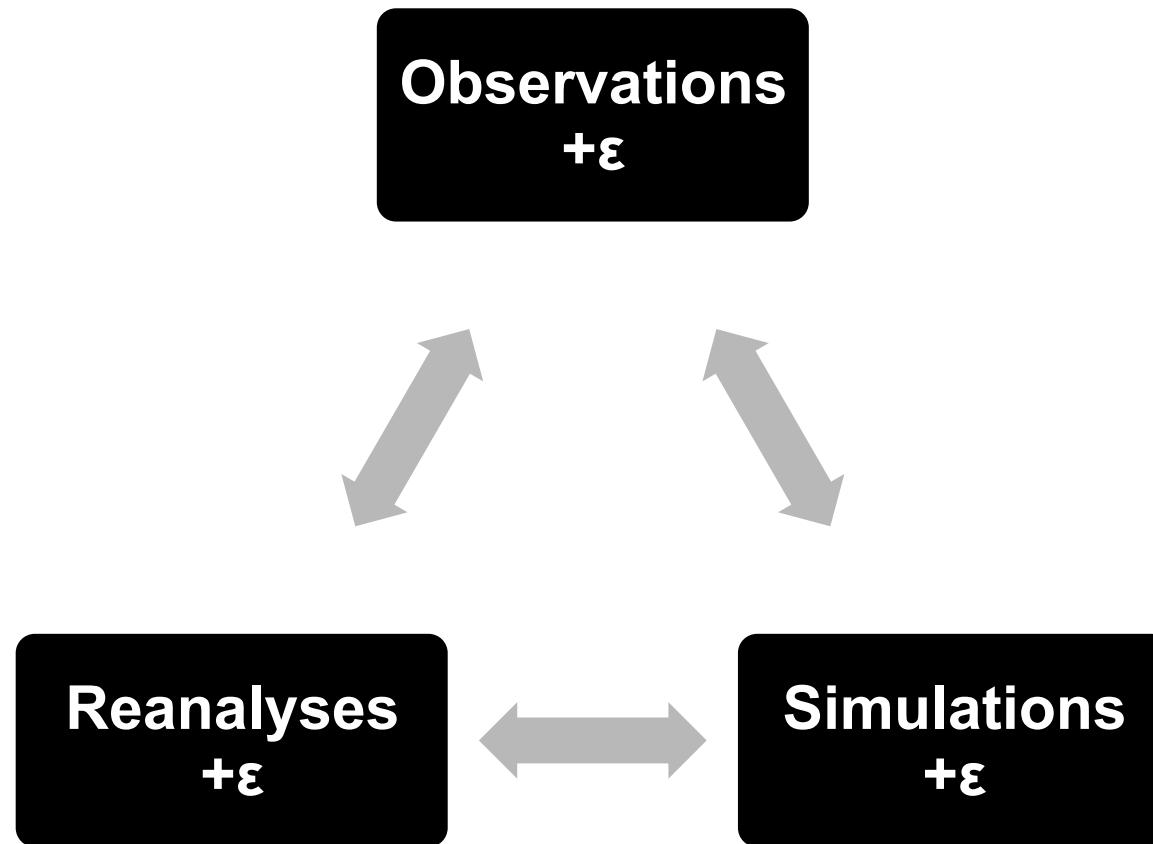
Understanding and Predicting Weather and Climate Extremes



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WCRP vision for a data infrastructure: Earth System Grid Federation



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THE
CLIMATE SYMPOSIUM
2014

Darmstadt, Germany
13-17 October 2014

Climate Research and Earth
Observations from Space

Climate Information
for Decision Making



GCOS

GLOBAL CLIMATE OBSERVING SYSTEM

GLOBAL CLIMATE
OBSERVATION
THE ROAD TO THE FUTURE



SHAPING THE NEXT GCOS
IMPLEMENTATION PLAN

2-4 March, 2016
Amsterdam

What's next?



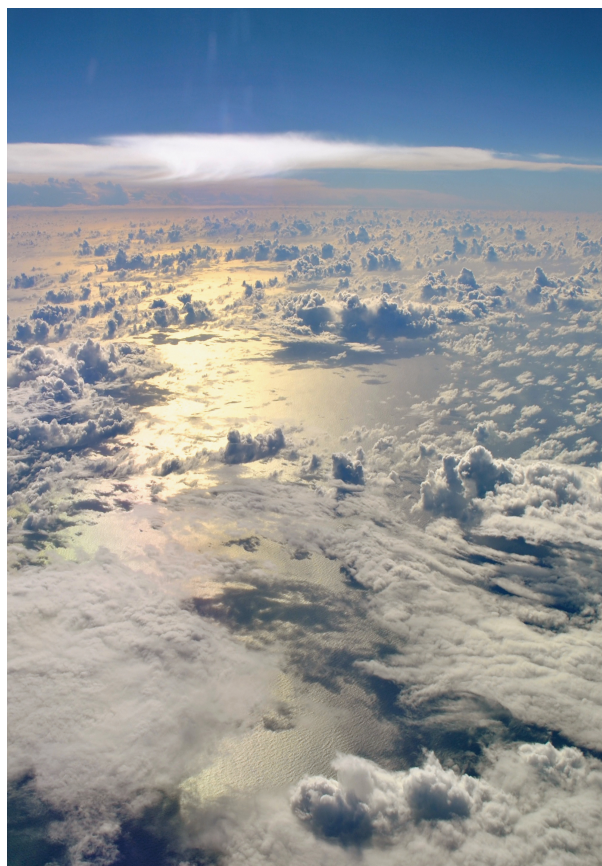
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“The elephant in the room” (A. Ratier)

- Risk management and decision making
- Propagation along the supply chain
- Need for traceability and ref observations
- Capturing uncertainties
- Error covariances
- Capturing new skill (reanalyses, sub-seasonal to decadal forecasts)
- How good is **good enough**? Moments? PDF?

Fiduceo

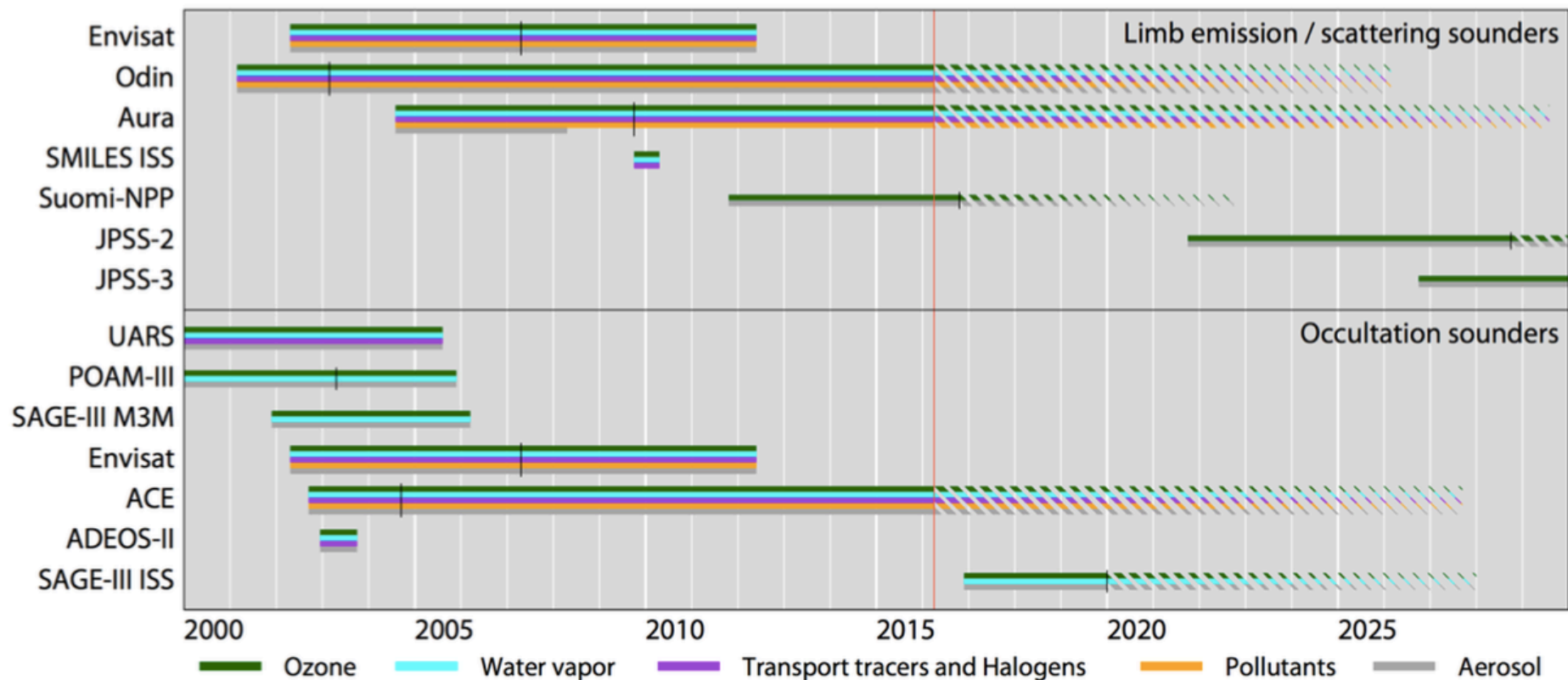


1. Atmospheric cloud radiative effects (CERES-like, for sfc radiation budget and vertical profiles of radiative cooling)
2. Highly-vertically resolved water vapor in LT (sharp gradients bw/ PBL and free troposphere)
3. Better estimates of cloud water path (separation of clouds and precipitation)
4. Vertical structure of latent heating, including surface evaporation (esp. below clouds for feedback studies)
5. Large-scale vertical velocity / convergence (esp. for mean circulation, tropics, MJO, prospects w/ ADM-Aeolus)
6. Support for a more continuous culture of complementary field experiments

(see details in S. Bony, GCOS conference 2016)

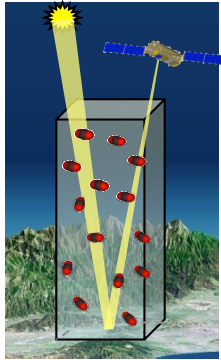


- **Vertical profiles** of many **atmospheric constituents** from UT to MS with **global coverage**
- **Stratospheric composition and circulation**
- **Problem:** gap expected in ozone and other trace species and aerosol measurements after current satellites fail



Integrated Global Greenhouse Gas Information System (IG3IS)

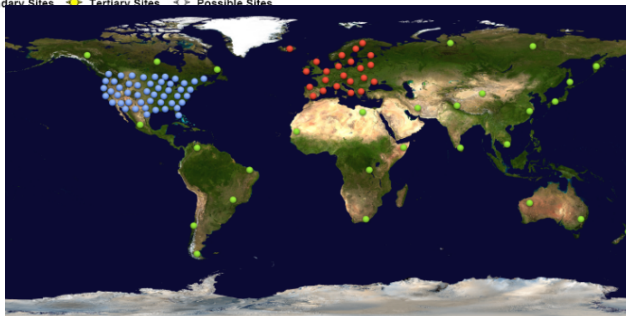
Satellites



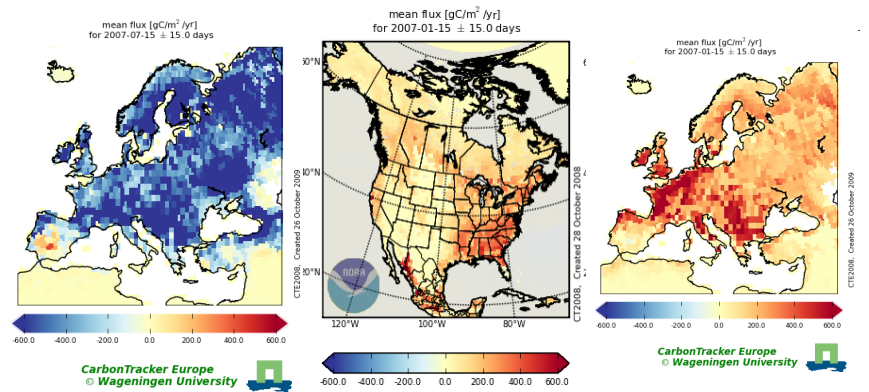
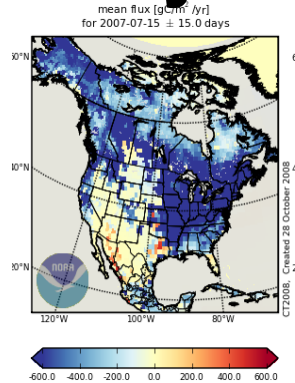
TCCON



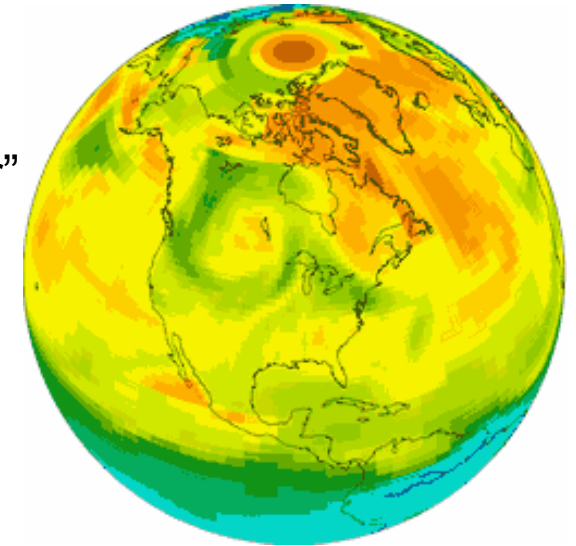
Earth Networks



China



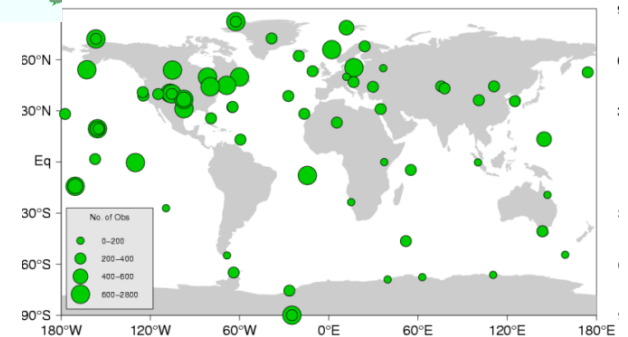
“Carbon Weather”



SE Asia



Current Network



Brazil





Next challenges

- Data set assessments: uncertainty
- obs4MIPs and ESGF: relaxing CMIP5, in-situ
- Fluxes: preparing for the model after next
- Reanalysis: towards coupling and ESM, 'reanaMIP'
- Possible WCRP-GCOS Data Prize: 2016 start
- Open data policy: review and finalization
- Next WCRP strategic plan: WDAC vision and input

Some upcoming events

- WCRP JSC37 and WMAC5, Geneva, 25-27 April 2016
- ICRC CORDEX Conference, Stockholm, 16-20 May 2016
- CLIVAR Open Science Conference, Qingdao, China, 18-25 September 2016
- S2D Conference, Spring 2017, TBD
- WGNE systematic error workshop, Montreal, 19-23 June 2017
- International conference on reanalysis, UK?, fall 2017

POLAR CHALLENGE

Be the first to complete a
2000 km continuous mission
with an Autonomous
Underwater Vehicle (AUV)
under the sea ice.



PRIZE MONEY AWARD 500,000 CHF

Compete for the Prize!
Become a co-sponsor!
www.wcrp-climate.org/polarchallenge

POLAR CHALLENGE



CONTEXT

The cryosphere plays a fundamental role in the climate system.
We need much better monitoring and prediction capabilities for the
polar regions.



OPPORTUNITIES

...erse. We can expand
capabilities to operate



VISION

A cost-effective, sustainable and autonomous polar ocean monitoring
system to drive a new era for climate research and services.

Co-sponsors:



WMO



Environment
Canada

Environnement
Canada



GOO GROUP ON
EARTH OBSERVATIONS



Endorsed by:



THE POLAR CHALLENGE



PRINCE ALBERT II
OF MONACO
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Many thanks to
NCEI,
CICS-NC,
Otis and colleagues!



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