Global Data Processing and Forecasting System: Building Community Earth System

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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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World Meteorological Organization
Organisation météorologique mondiale

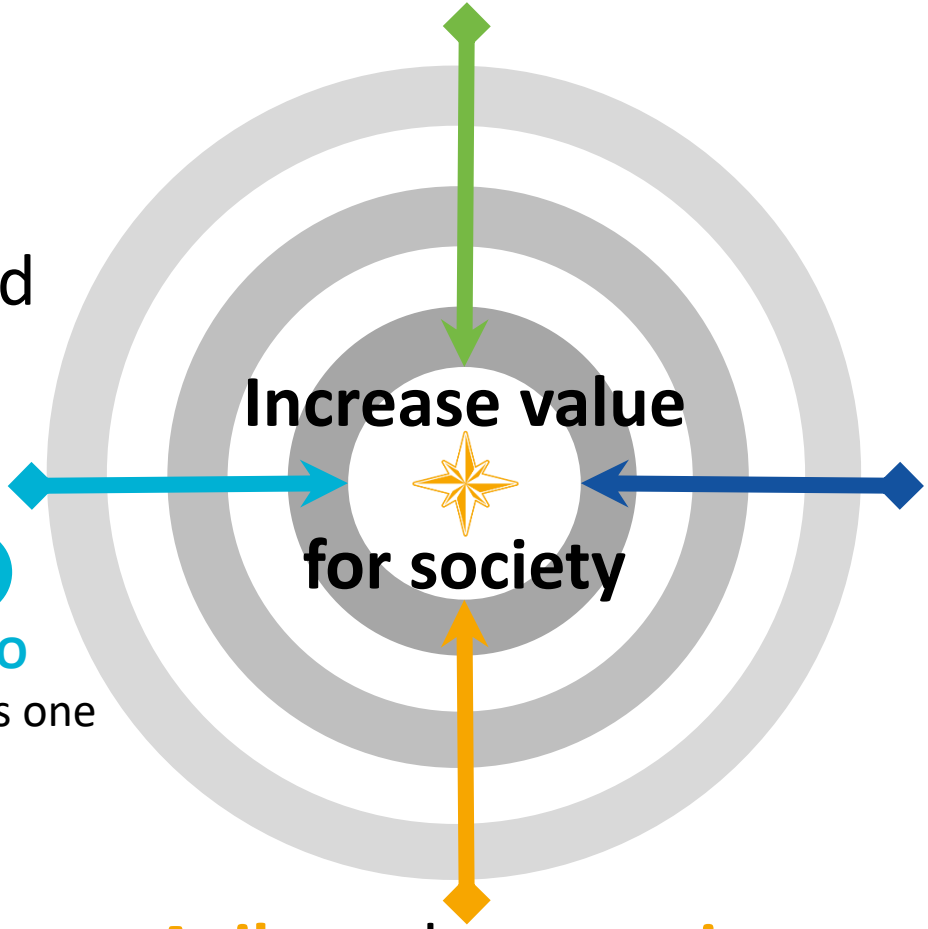
REFORM OBJECTIVES

Effectiveness and **efficiency**

Seamless and **integrated** approach

Earth System approach

WMO acting as one



Engagement of Members and Partners

Agile and **responsive** to **new challenges**

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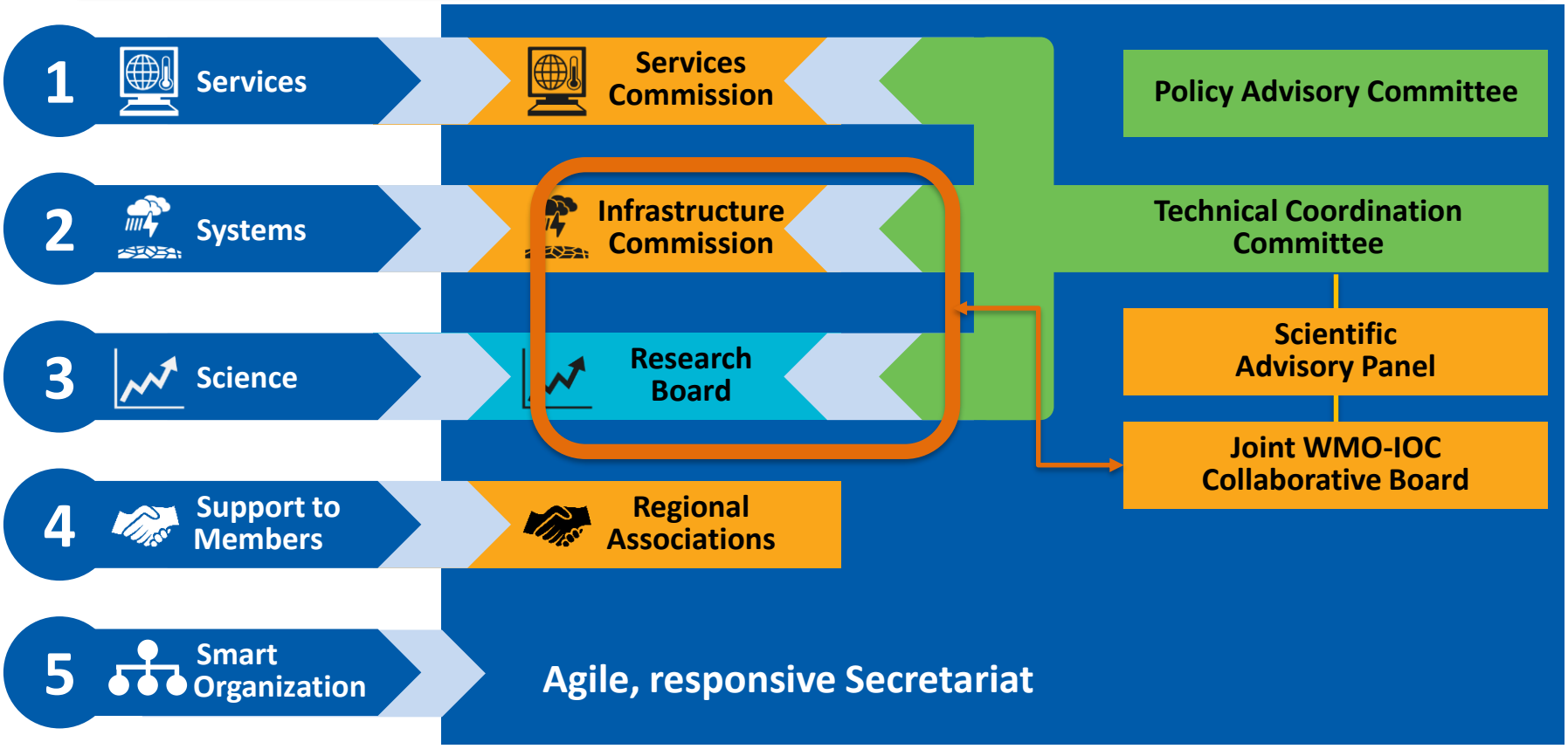
ALIGNMENT OF WMO STRUCTURES

GDPFS2.0 – Building Community Earth System



- EC-70 Recommendations to Congress
- Established by EC-70

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GDPFS2.0
Building Community Earth System

- GDPFS is an effective way to coordinate and implement global and regional operational seamless Earth System prediction for the benefit of worldwide citizens
- Seamless prediction considers not only all compartments of the Earth system, but also all disciplines of the weather–climate–water–environment value cycle to deliver tailor-made weather, climate, water and environmental information covering minutes to centuries and local to global scales.

GDPFS2.0

Building Community Earth System

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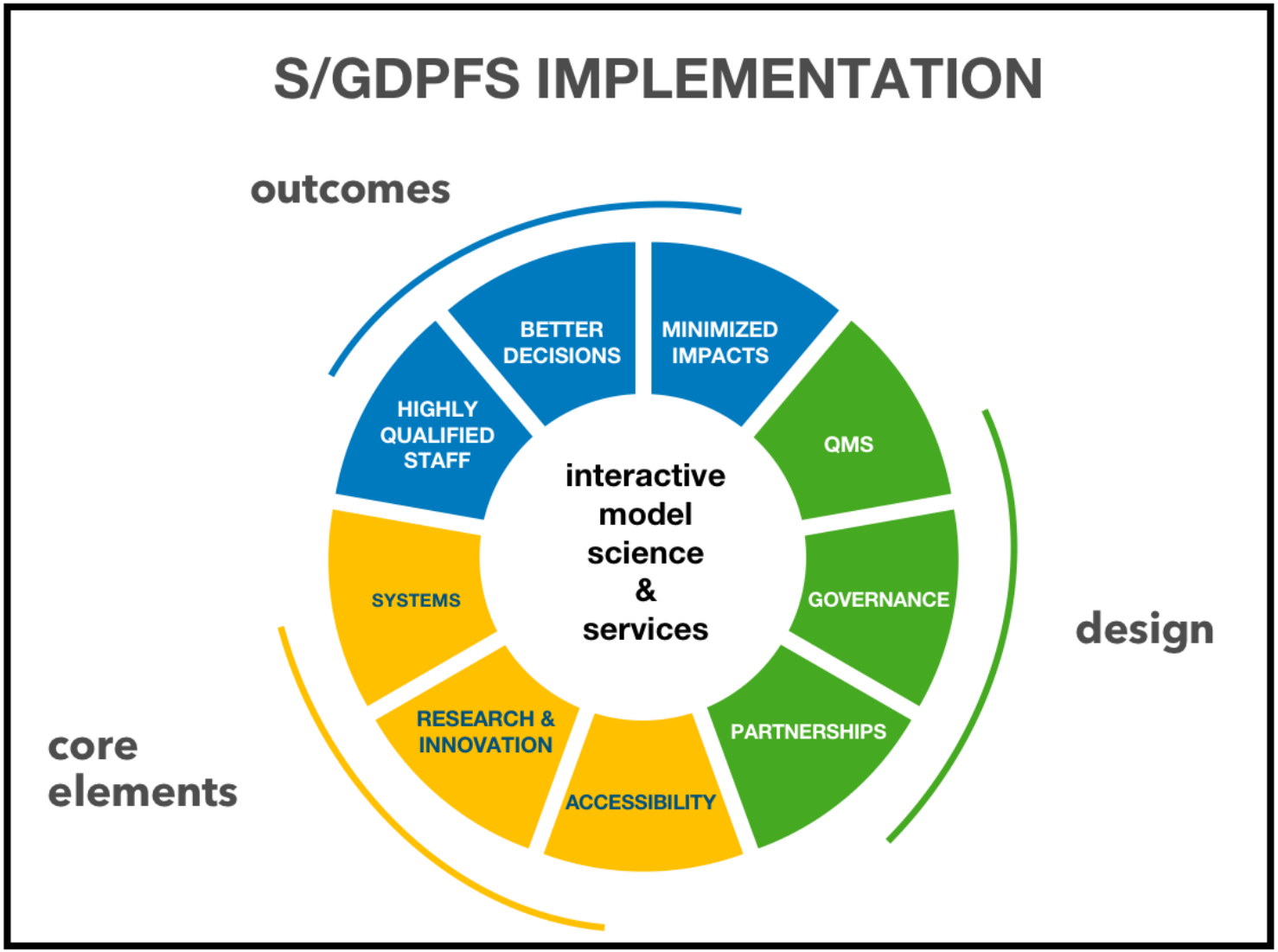
Implementation Plan Components



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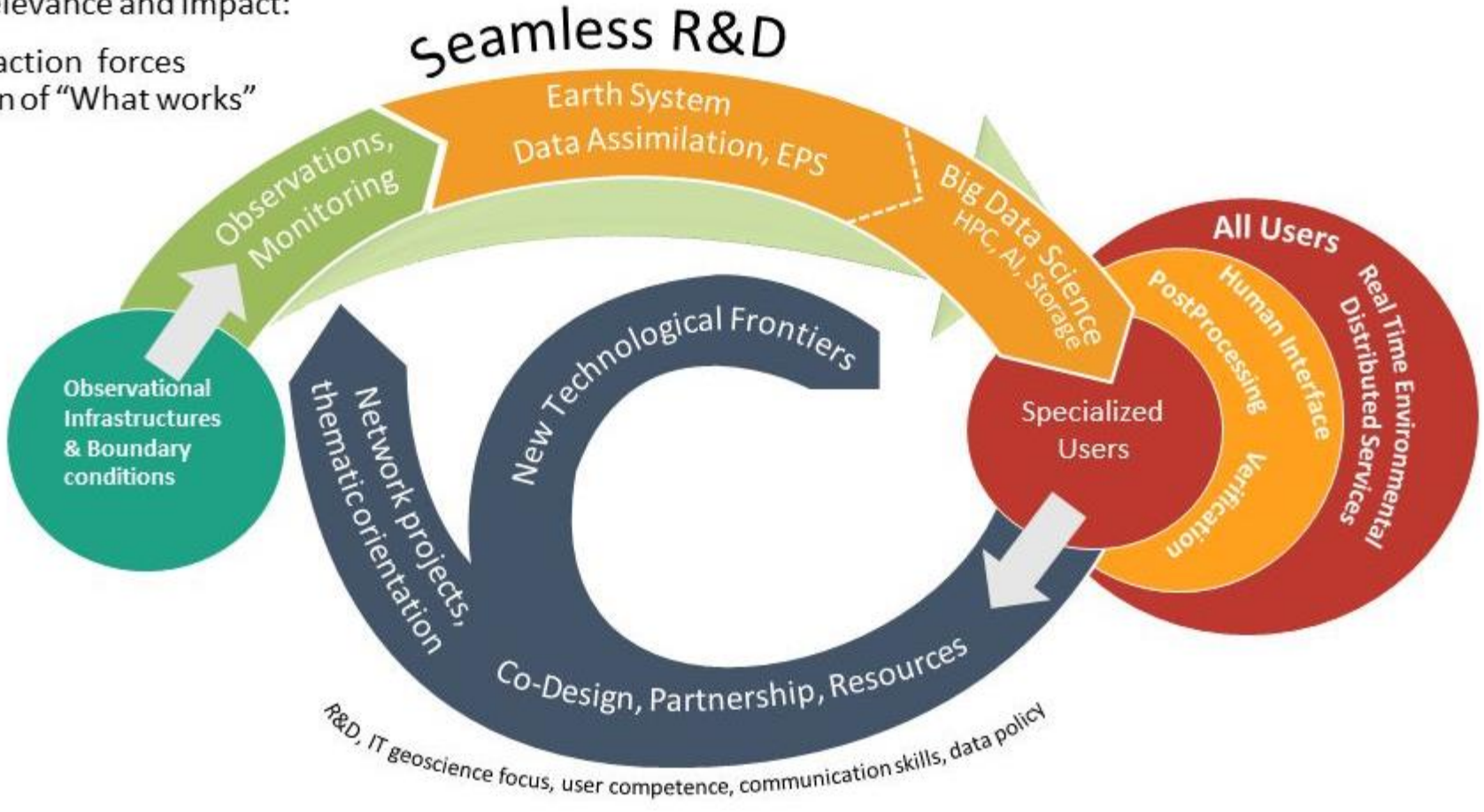
A value cycle approach

Quality, Relevance and Impact:

User Interaction forces exploration of "What works"



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An Integrated and Customized System across multiple time and space scales, addressing broader spectrum of user needs, applying an Earth system approach, generating tailored products for specific user needs

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Research & Innovation

Strengthen science linkages among compartments of Earth system, allow development of novel operational products, exploit predictability on all time and space scales, promote socio-economic research.

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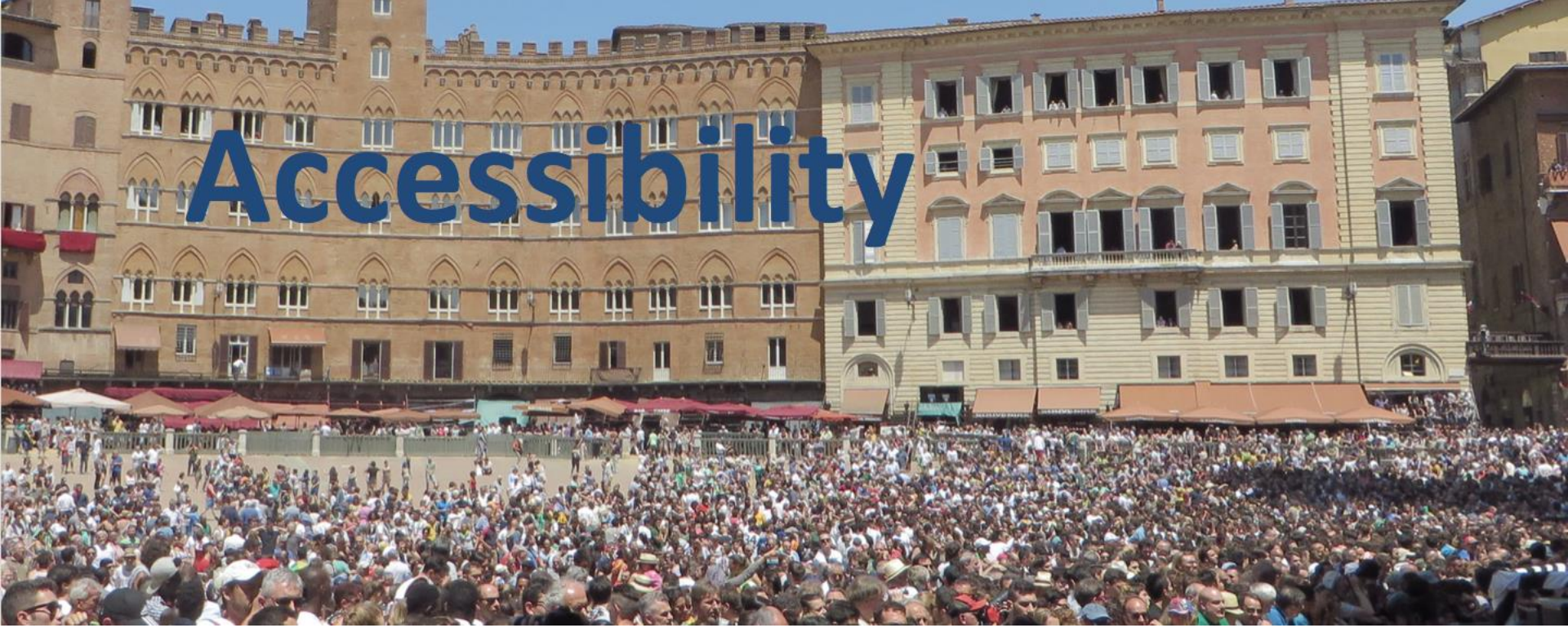

Accessibility

Accessibility of data products and services from S/GDPFS complemented by future plans for the federated WMO Information System. Address challenges of growing data volumes, providing familiar interfaces and applications, combining meteorological data with data from other agencies / socio-economic data.

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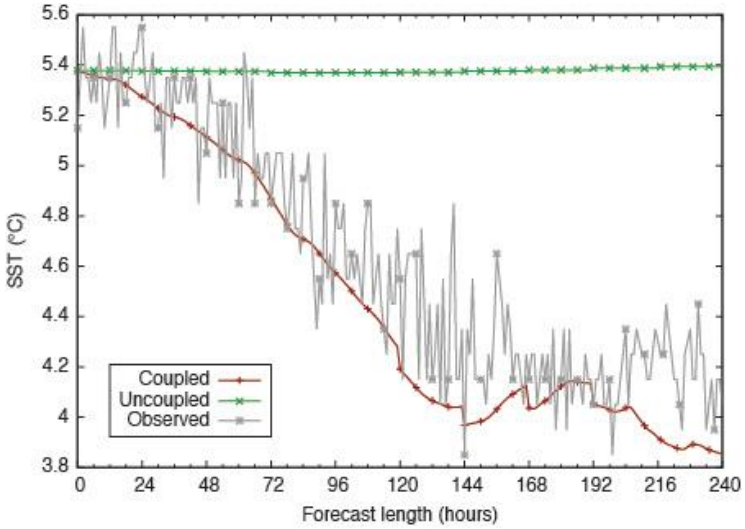
Ocean Relevance for Earth System modeling

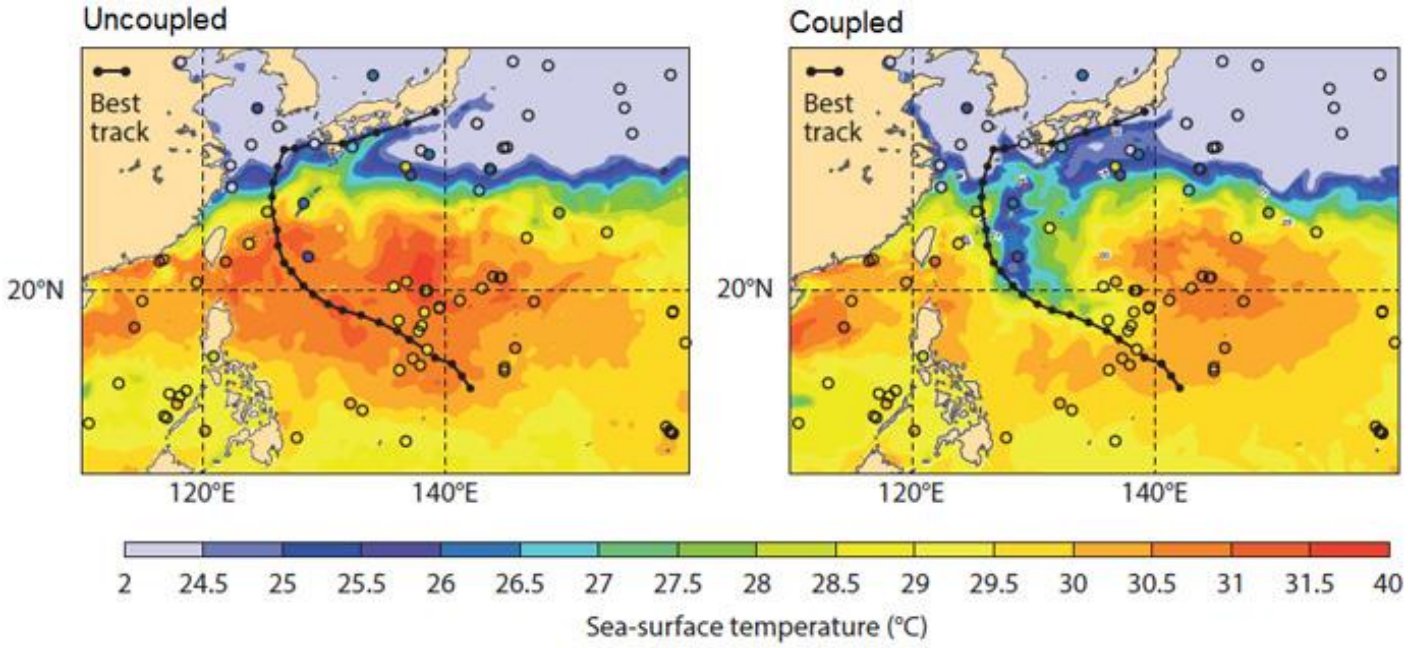
- Improve the multi-scale interactions through the land – sea – ice -atmosphere interfaces.
- Improve coupled modeling of atmosphere/land/ocean/water, in particular vertical and lateral exchange processes need to be better understood and modelled
- Investigate the coupling of numerical environmental prediction models with impact models and observations
- Improve data assimilation for moist processes and coupled systems.
- Demonstrate coupled analysis/reanalysis capabilities

Seamless Short Term Prediction



Neoguri-ocean interaction. *Five-day SST forecasts for the area of Neoguri starting on 5 July 2014 using the uncoupled model (left) and the coupled model (right). SST observations from ships and buoys (circles) confirm that the coupling leads to more realistic SST predictions along the path of the cyclone ('best track' data – black line).*

The SSTs predicted by the coupled system closely matched the SSTs observed by a North Sea weather buoy.



Value Chain Example: Polar Prediction

1 DESIGNING NEW OBS NETWORK

Key questions from operational centers and society have inspired the development of the Polar Prediction Project

2 PREDICTIVE CAPABILITIES

Polar Prediction Project planned research activities with a strong connection to operational aspects (ECMWF, NCEP)

3 ENGAGING COMMUNNITIES

Climate Community strongly engaged on process studies

4 PROVIDING INPUTS TO DECISION MAKERS

YOPP provided key inputs in high level meetings (Arctic Science Ministerial, …)

YOPP YEAR OF POLAR PREDICTION

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Year of Polar Prediction

Arctic Winter Special Observing Period (SOP) (1 Feb–31 Mar 2018)

- 1,990 extra radiosondes from 17 Arctic stations including field work (7 nations involved)
- Major addition of buoys for SOP2
- YOPP endorsed campaigns
  - **Iceland-Greenland Seas Project** (N Atlantic) –100 sondes from vessel
  - **OASIS-YOPP** (Thule Base, Greenland) –Helium shortage but 3 sondes
  - **ICECAPS** (Summit Camp, Greenland) – 2 daily sondes, no extra
  - **MACSSIMIZE** (Alaska, Canada) –aircraft campaign over Canada, snow emissivity

WWRP WORLD WEATHER RESEARCH PROGRAMME

Concrete Activities




A key part of the implementation of the future S/GDPFS will be the definition and carrying out of benchmarks, pilot projects and test beds (to be tested in a research or quasi-operational setting). Currently a number of potential activities have been identified around:

- **Developing and strengthening regional partnerships;**
- **Seamless prediction at the weather-climate interface;**
- **Seamless prediction from minutes to hours;**
- **Developing Public-Private Partnerships;**
- **Developing Integrated Air Quality Prediction and Forecast Systems in Africa;**
- **Developing probabilistic hydro-meteorological products; and**
- **Assessing future multiscale requirements.**

Need to identify gaps and develop / prioritise pilots where ocean matters for Earth System prediction!

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A glimpse of the future….

This short video will show you simulations from fully coupled atmosphere-ocean-ice modeling systems….

https://www.youtube.com/watch?v=cjKrIp5ZGPQ

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WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

Thank you
Merci
Nadia… floor is yours !

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