



Developing a truly global framework for climate services: The GFCS

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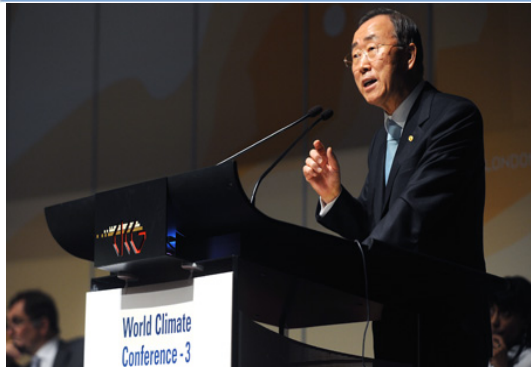
presented at the

ERA-CLIM2

4th general assembly

(Bern, 14 December 2017)





The 3rd World climate Conference: an historic event

Endorsed by :

- 13 Heads of state or government
- 81 Ministers
- 2,500 scientists

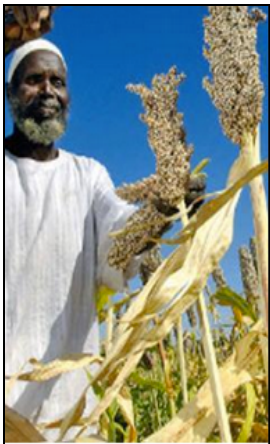




Vision of the GFCS

To enable **better management of the risks** of climate variability and change and **adaptation to climate change**, through the development and incorporation of **science-based climate information** and prediction into planning, policy and practice at global, regional and national scales.”

Priority Areas



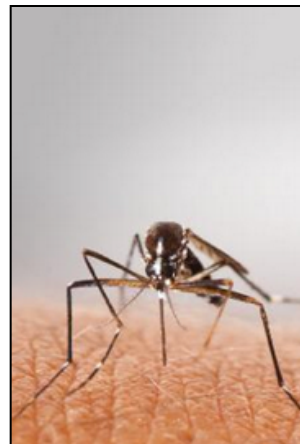
Agriculture and food security



Disaster risk reduction



Water



Health



Energy



What are Climate Services?

- **Information on past, present and future climate, and on its impacts on natural and human systems**
 - Historical climate data sets
 - Climate monitoring
 - Decadal / Monthly / Seasonal climate predictions
 - Climate change projections
- **Improved climate related outcomes**
 - Access to products adapted for decision making, and
 - Use them appropriately, including aspects of uncertainty

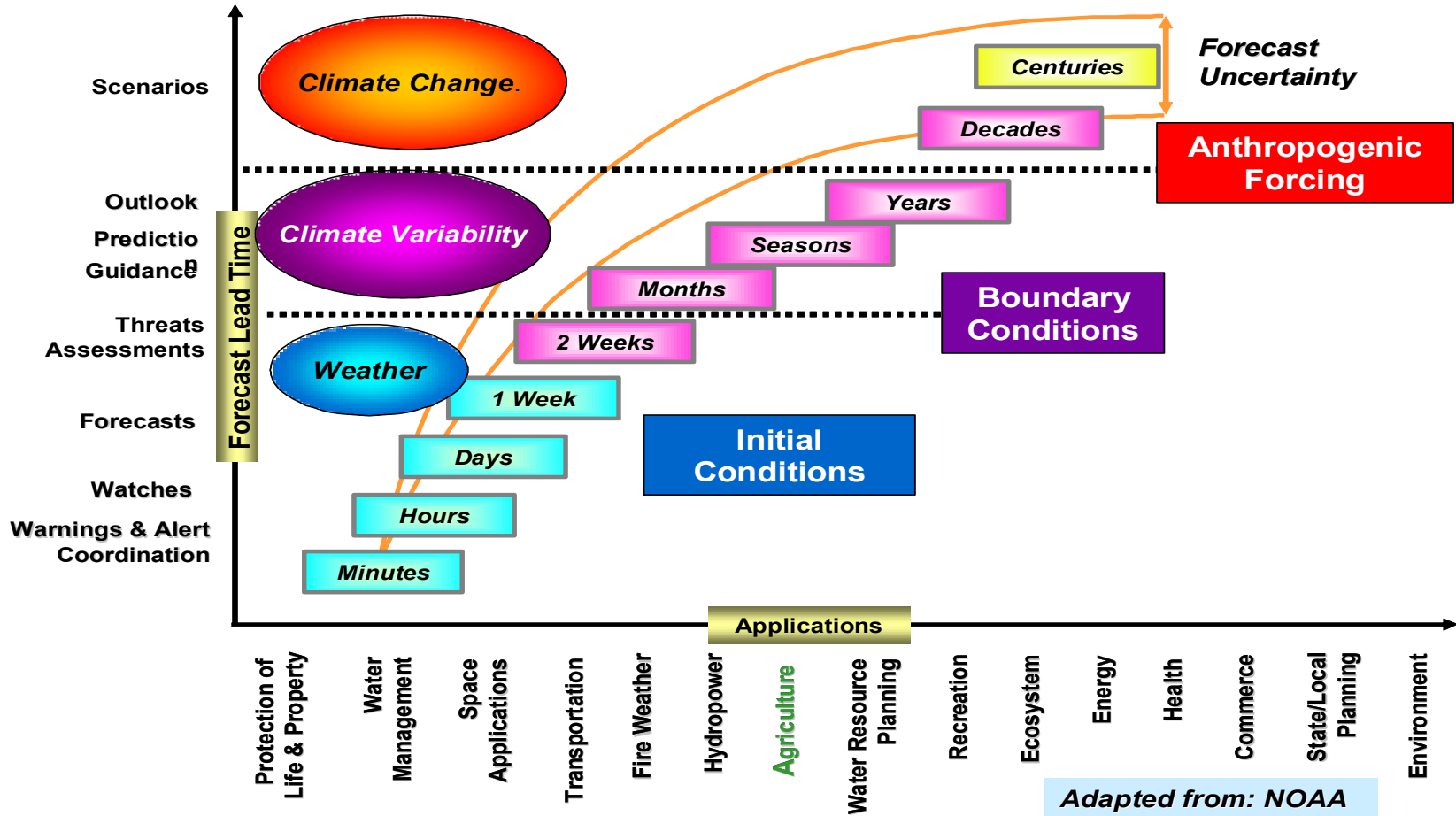


Photo Credits: NASA, Pedro Sanchez, Renzo Taddei

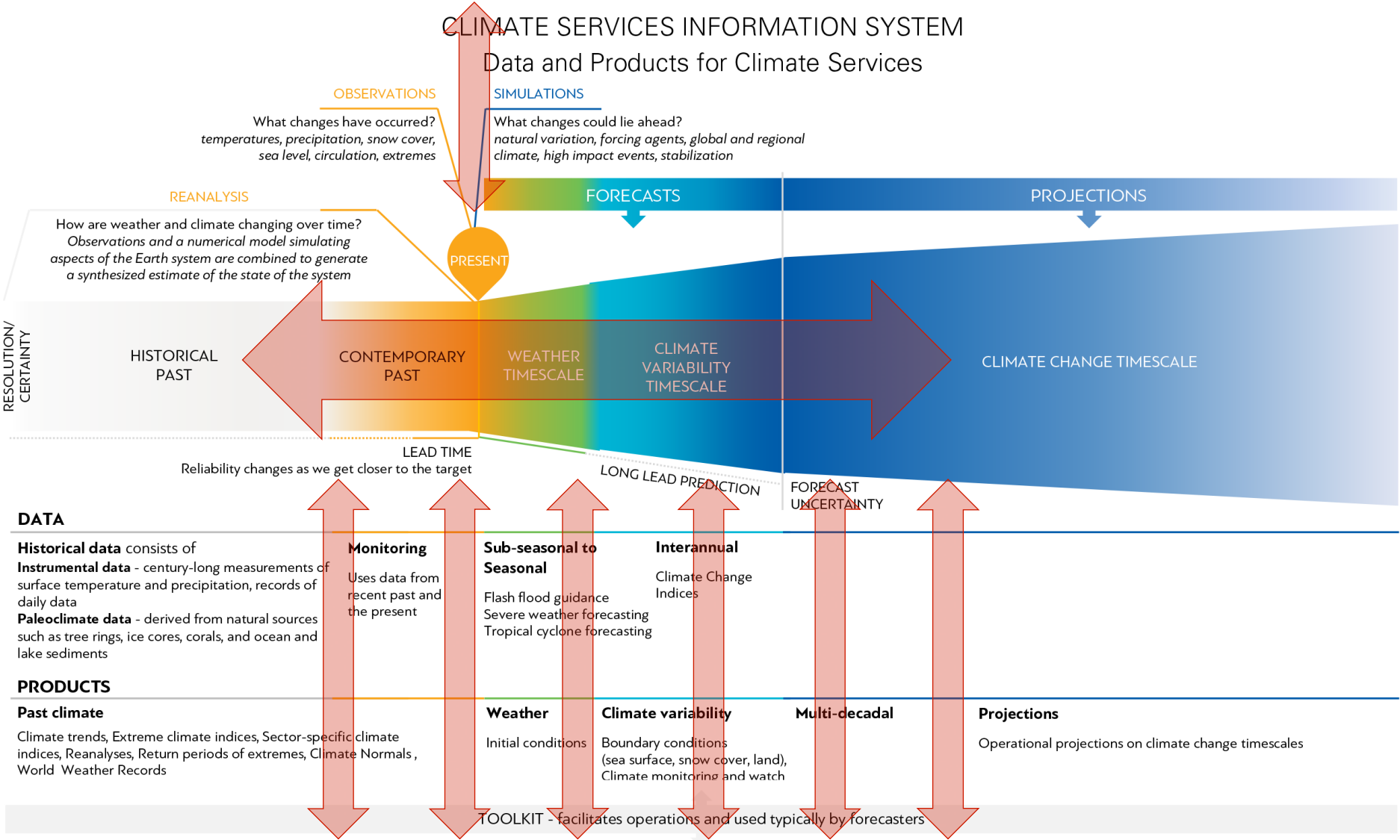


Seamless hydrometeorological and climate services

Climate Prediction Framework



INDICATORS FOR GLOBAL POLICY PROCESSES, E.G. GLOBAL STOCKTAKE, SDG 13



TAILORED PRODUCTS FOR DECISION SUPPORT – products can either be tailored in space and time or according to the decision relevance

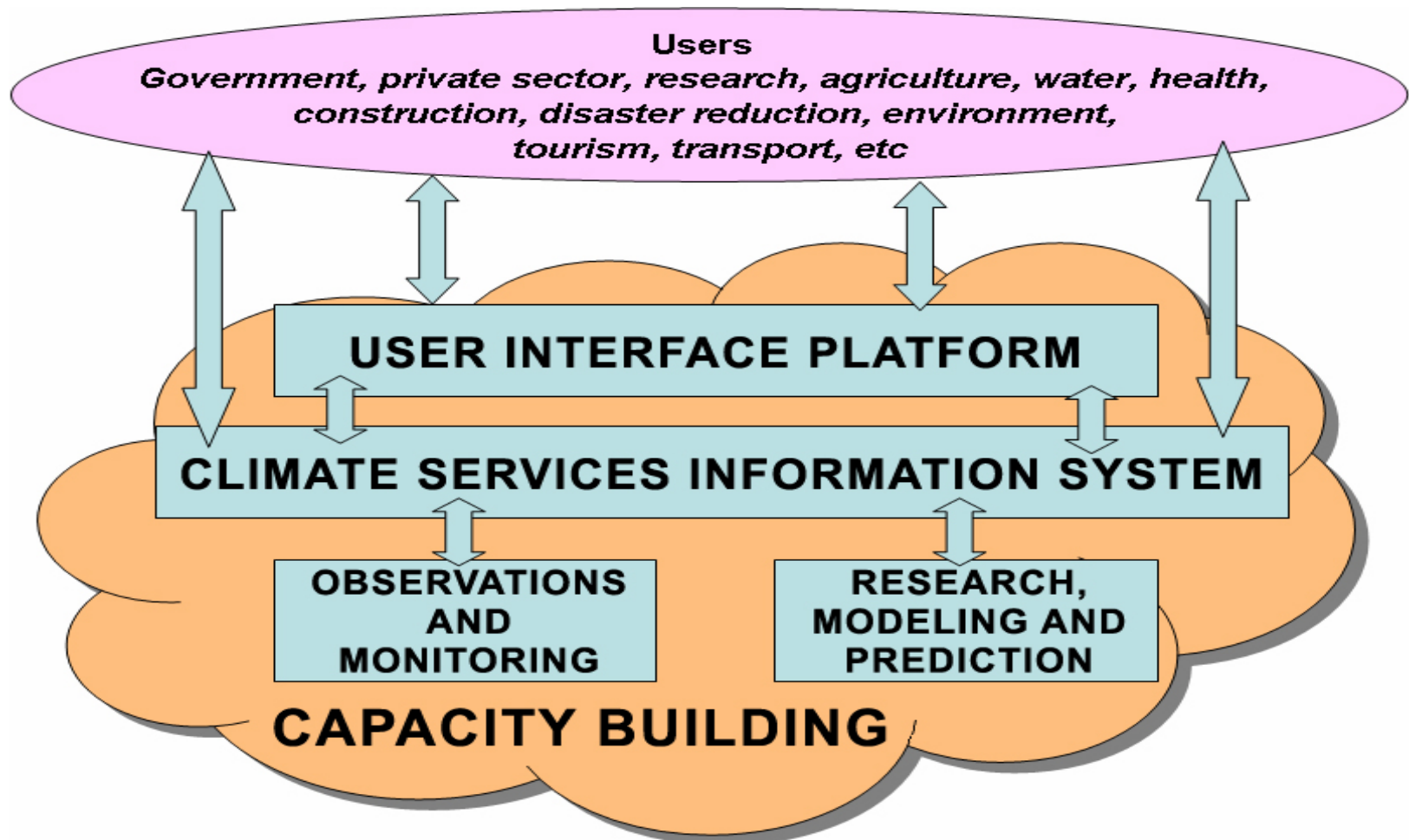
DECISION SUPPORT APPLICATIONS – climate services apply past climatological records, contemporary monitoring and expected future conditions to socio-economic sectors

In agriculture, to inform crop choice, planting to optimize yield and minimizing crop failure risk Disaster risk identification based on extreme event return periods and trends	Emergency response, Disaster Risk Reduction	Contingency plans, humanitarian response, government and private infrastructure investment	Informs mitigation policy and adaptation choices Impacts on water resources, heat stress, crops, infrastructure
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SERVICE DELIVERY AT COUNTRY LEVEL



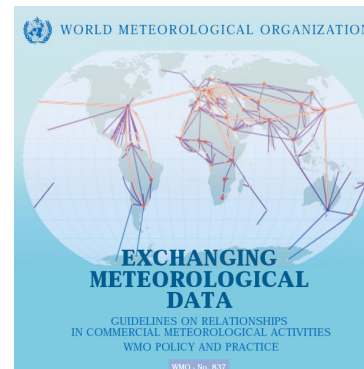
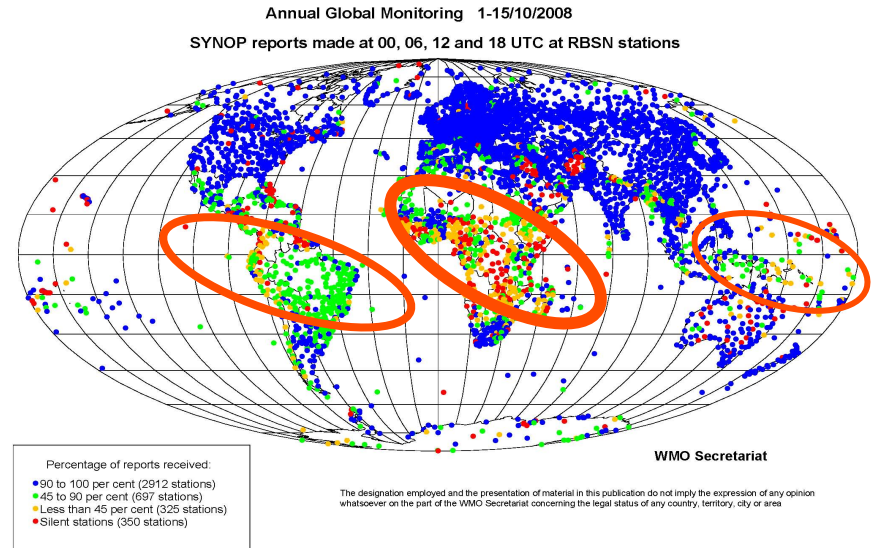
Overall structure





Some of the challenges: 1) observations

- ✓ **Traditional observations**
 - ✓ Too many gaps still
 - ✓ Need for more parameters
- ✓ **Data rescue**
- ✓ **Reanalysis**
 - ✓ Extend length
 - ✓ Additional observations
- ✓ **Data exchange**
 - ✓ Reso 40 (Cg-XII 1995)
 - ✓ Reso 25 (Cg-XIII 1999)
 - ✓ Reso 60 (Cg-XVII 2015)





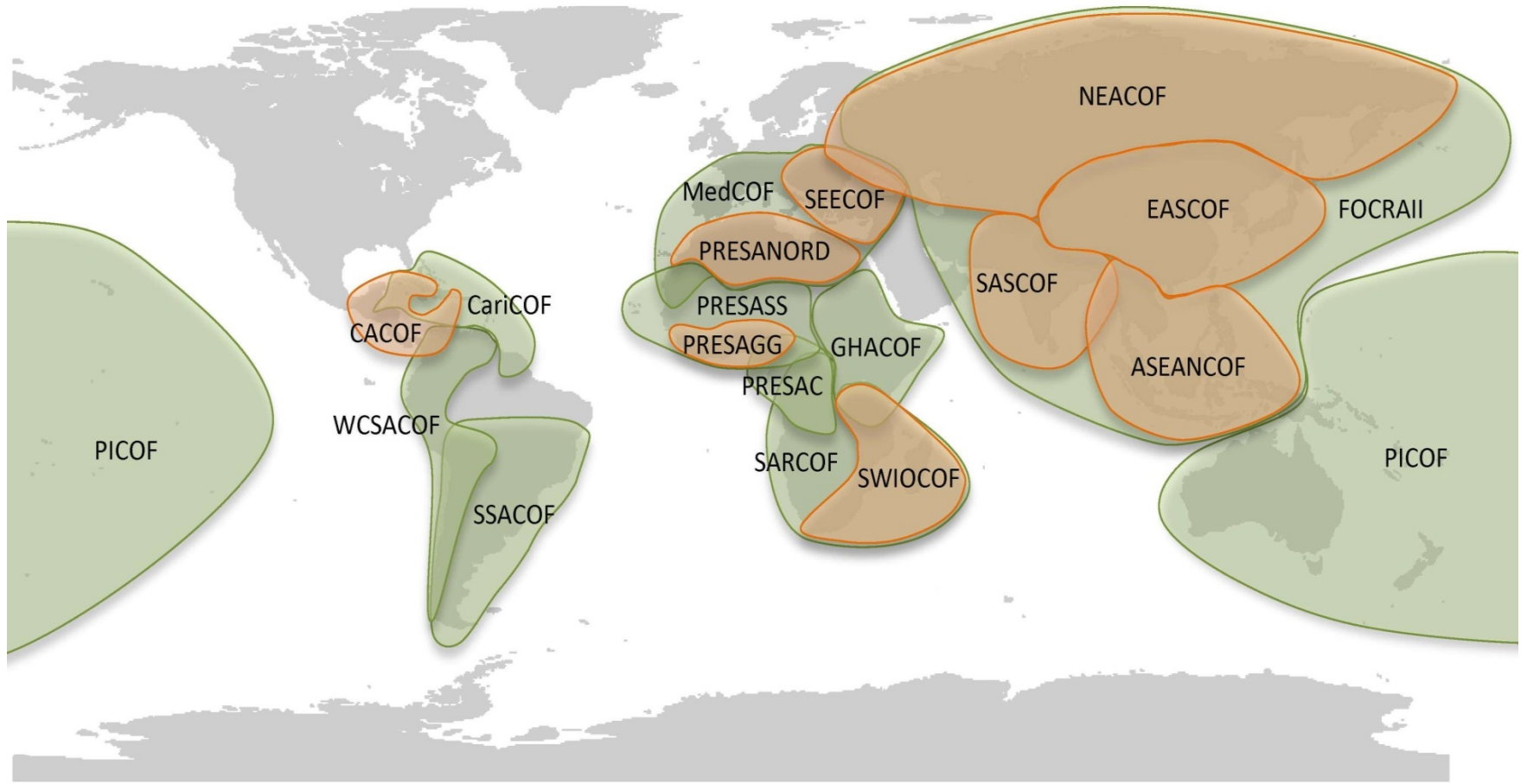
2) Development issues

- ✓ **Support to Agenda 2030 (SDGs)**
- ✓ **Gender empowerment**
- ✓ **Human resources development**
- ✓ **Continuing education and training**
- ✓ **Special needs of LDCs**





Regional Climate Outlook Forums





3) Socio-economic aspects

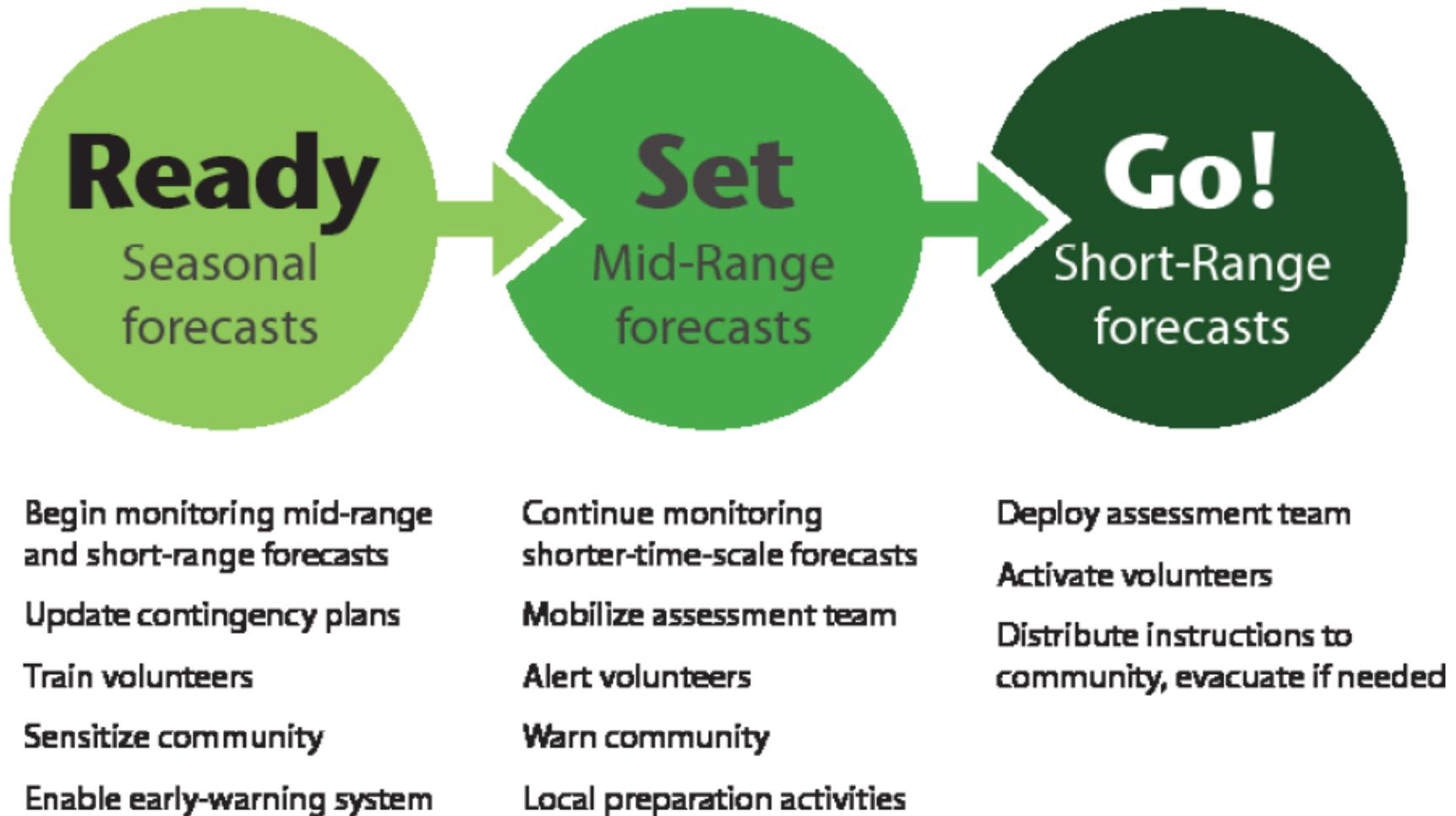
In line with the 2030 Agenda, the following issues are increasingly significant for GFCS development:

- ✓ **Decision-makers awareness**
- ✓ **Dialogue and partnership with all actual & potential user sectors**
- ✓ **Outreach to academia & the media**
- ✓ **Consistent evaluation methodologies**
- ✓ **National development strategies & regional perspectives**





4) Decision-making across timescales



The Global Framework for Climate Services: a partnership

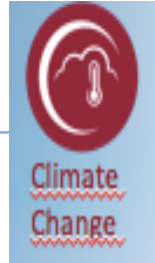


Successful adaptation (and mitigation) will require substantially increased investment in climate services





C3S and the ecosystem



etc...



National Climate Services

- Value chain at local level, governments, etc.
- Provision of pan-European dimension for national businesses



EEA (Climate Adapt):

- State of Climate for Europe
- Climate Indicators
- CDS toolbox
- CC IV report

GFCS:

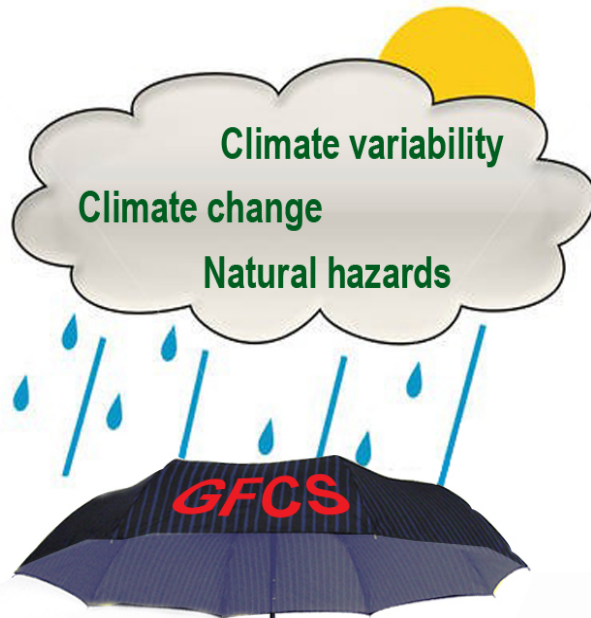
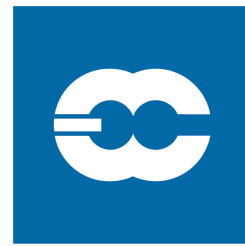
- Global products (ECVs, reanalyses, seasonal forecasts and projections)
- WIS compliance
- Training and outreach
- Global Sector Information System
- Liaison with RCCs

H2020/ERA4CS/JPI/KIC/etc.:

- CDS as a data resource
- Liaison with RD projects
- Underpinning science

GEO:

- C3S discoverable through GEOSS portal
- Contribution to many SDGs



**SOCIOECONOMIC
DEVELOPMENT**

Decision-making,
security, energy,
science & technology,...

**SUSTAINABLE
DEVELOPMENT**

MDGs: food, health,
water, education,
poverty alleviation,...

Danke

Merci

Thank you



Contribution of the High-level Taskforce on GFCs



WMO Global Producing Centres



- **Beijing:** China Meteorological Administration (CMA) / Beijing Climate Center (BCC)
- **CPTEC:** Center for Weather Forecasting and Climate Research / National Institute for Space Research (INPE), Brazil
- **ECMWF:** European Centre for Medium-Range Weather Forecasts
- **Exeter:** Met Office, United Kingdom
- **Melbourne:** Bureau of Meteorology (BOM), Australia
- **Montreal:** Meteorological Service of Canada (MSC)
- **Moscow:** Hydrometeorological Centre of Russia
- **Offenbach:** Deutscher Wetterdienst
Wetter und Klima aus einer Hand
- **Moscow:** Hydrometeorological Centre of Russia
- **Pretoria:** South African Weather Services (SAWS)
- **Seoul:** Korea Meteorological Administration (KMA)
- **Tokyo:** Japan Meteorological Agency (JMA) / Tokyo Climate Center (TCC)
- **Toulouse:** Météo-France
- **Washington:** Climate Prediction Center (CPC) / National Oceanic and Atmospheric Administration (NOAA), United States of America



Source: WMO LC-LRFMME

**STATION INVENTORY AND METADATA
REVIEW OF REQUIREMENTS
IMPLEMENTATION AND MAINTENANCE PLAN**

**NATIONAL SCALE
REANALYSES/
BLENDED PRODUCTS**

OBSERVATIONS

What changes have occurred?
temperatures, precipitation, snow cover,
sea level, circulation, extremes

SIMULATIONS

What changes could lie ahead?
natural variation, forcing agents, global and regional
climate, high impact events, stabilization

REANALYSIS

How are weather and climate changing over time?
Observations and a numerical model simulating
aspects of the Earth system are combined to generate
a synthesized estimate of the state of the system

PRESENT

FORECASTS

RESOLUTION/
CERTAINTY

HISTORICAL
PAST

**DATA RESCUE
HOMOGENISATION
& QUALITY CONTROL**

CONTEMPORARY
PAST

CLIMATE DATA MANAGEMENT SYSTEM

WEATHER
TIMESCALE

CLIMATE
VARIABILITY
TIMESCALE

LEAD TIME

Reliability changes as we get closer to the target

LONG LEAD PREDICTION

FORECAST
UNCERTAINTY

DATA

Historical data consists of
Instrumental data - century-long measurements of surface temperature and precipitation, records of daily data
Paleoclimate data - derived from natural sources such as tree rings, ice cores, corals, and ocean and lake sediments

Monitoring
Uses data from recent past and the present

Sub-seasonal to Seasonal
Flash flood guidance
Severe weather forecasting
Tropical cyclone forecasting

Interannual
Climate Change Indices

CLIMATE SERVICES INFORMATION SYSTEM
Data and Products for Climate Services