



World Meteorological Organization

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# Climate Variability and Change: Impacts on Water Availability

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WMO

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## OUTLINE

1. Latest scientific understanding on climate change,
2. WMO delivering science based services through its various programmes,
3. Global Framework for Climate Services (GFCS), new initiative that has been taken by the WMO in collaboration with other international agencies to provide climate information and services
4. Need for broader collaboration and cooperation among different development sectors at global as well as regional and national levels.

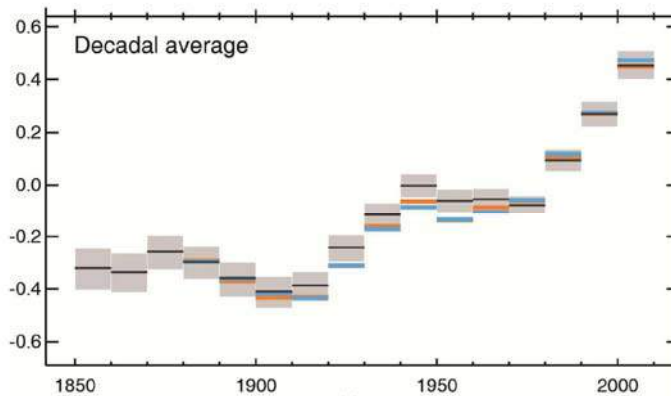


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## Latest scientific understanding on climate change



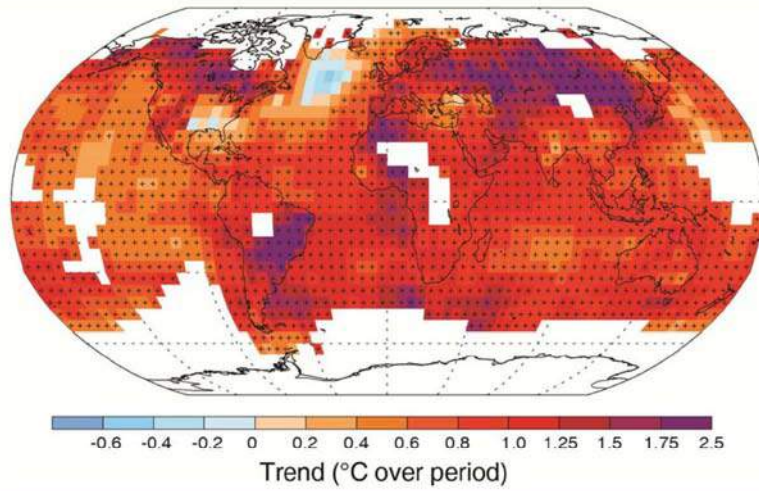
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(IPCC 2013, Fig. SPM.1a)

Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.

In the Northern Hemisphere, 1983–2012 was *likely* the warmest 30-year period of the last 1400 years (*medium confidence*).

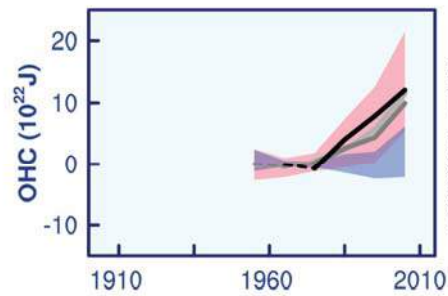
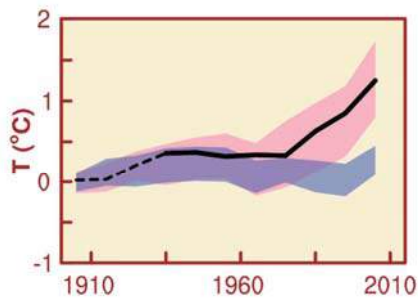


(IPCC 2013, Fig. SPM.1b)

**Warming in the climate system is unequivocal**

IPCC AR5 Working Group I  
Climate Change 2013: The Physical Science Basis

ipcc  
INTERGOVERNMENTAL PANEL ON climate change  
WMO UNEP

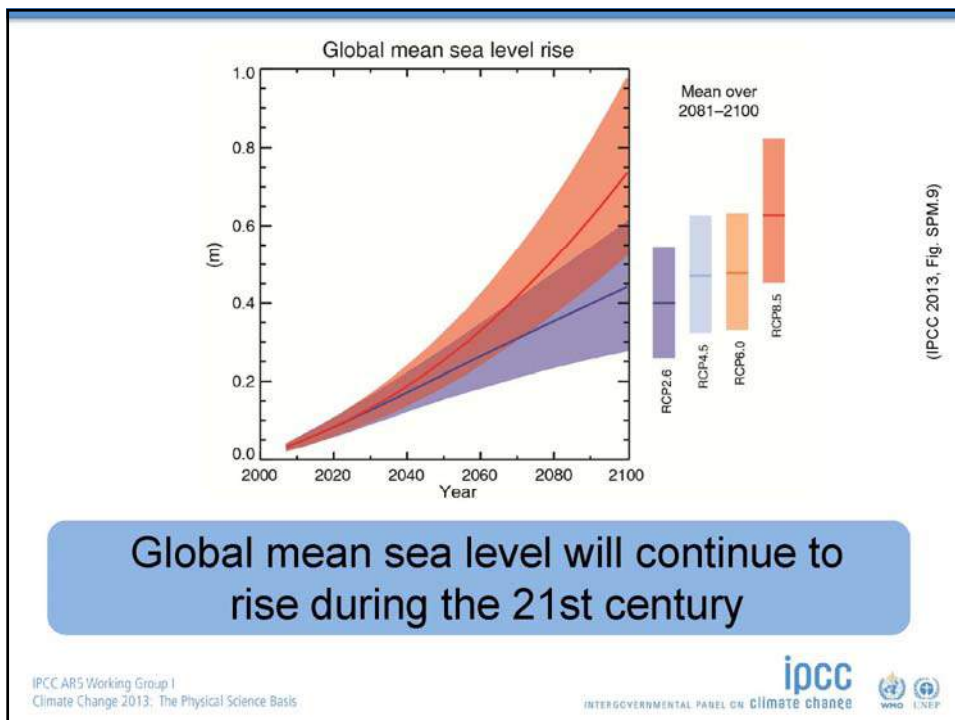
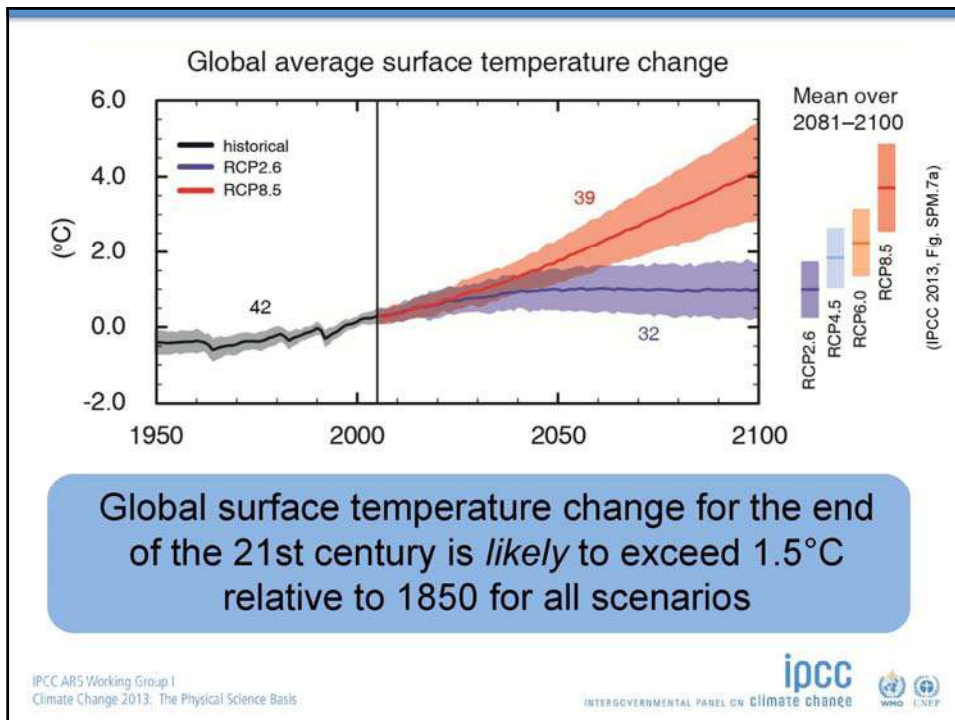


(IPCC 2013, Fig. SPM.6)

**Human influence on the climate system is clear**

IPCC AR5 Working Group I  
Climate Change 2013: The Physical Science Basis

ipcc  
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## WMO Programmes: Delivering science based services



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The screenshot shows the homepage of the Associated Programme on Flood Management (APFM). The header features the APFM logo (a blue circle with three wavy lines) and the text "APFM ASSOCIATED PROGRAMME ON FLOOD MANAGEMENT". To the right of the logo are two rows of navigation buttons: "INFODESK:" with buttons for "PUBLICATIONS", "PROJECTS", "ABOUT APFM", and "COMMUNITY"; and "HELPDESK:" with buttons for "GET HELP | HELP YOURSELF", "EDUCATION", "DATABASES", and "FAQ". Below the header is a "HIGHLIGHTS:" section with a large image of water splashing. Overlaid on the image is the text "INTEGRATED FLOOD MANAGEMENT" in large blue letters, followed by "A NEW APPROACH TO FLOOD MANAGEMENT" in smaller blue letters. Below this text is a horizontal row of six numbered buttons (1-6), with button 1 highlighted in dark blue. At the bottom of the page, the text "Associated Programme on Flood Management - APFM" is displayed in bold black font, followed by the website address "www.apfm.info" in bold black font.



## High-Level Meeting on National Drought Policies

- **March 11-15 2013**
- **Over 414 participants from 87 countries**
- **Main Partners – UNCCD, FAO, WMO**
  
- **Key message: Help countries move from reactive to proactive drought policies**
  
- **Final Declaration adopted – [www.hmndp.org](http://www.hmndp.org)**



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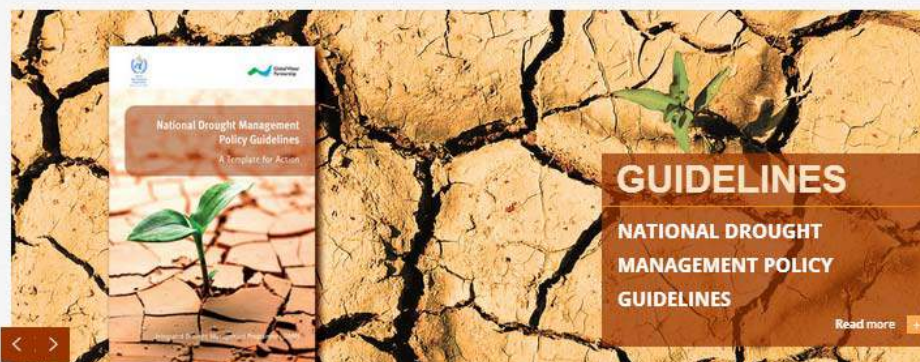
### IDMP

Integrated Drought Management Programme



HOME ABOUT FIND CONNECT-ACTIVITIES

Search



## Integrated Drought Management Programme - IDMP

[www.idmp.info](http://www.idmp.info)

## Global Framework for Climate Services (GFCS)



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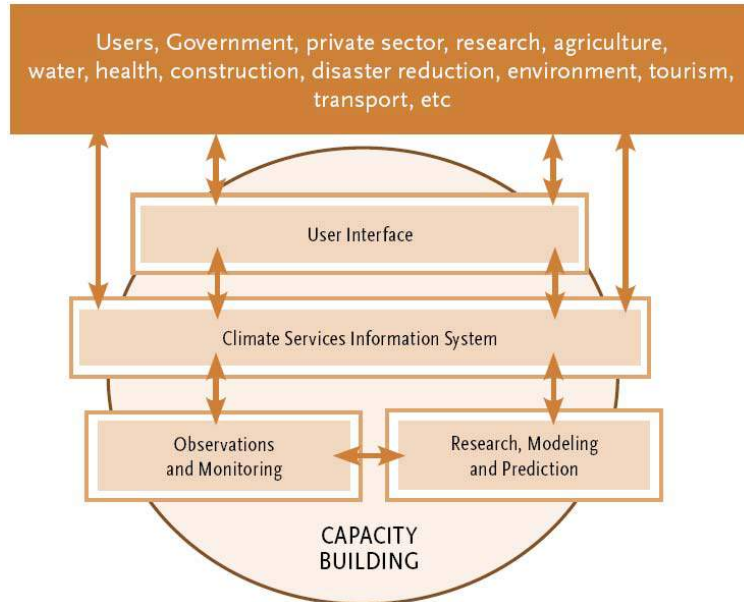
## Global Framework for Climate Services

- Goal: Enable better management of the risks of climate variability and change and adaptation to climate change at all levels, through development and incorporation of science-based climate information and prediction into planning, policy and practice.



**WORLD CLIMATE CONFERENCE - 3**  
Geneva, Switzerland  
31 August–4 September 2009

## GFCS Components



## GFCS Priorities

- **Agriculture**
- **Disaster risk reduction**
- **Water**
- **Health**





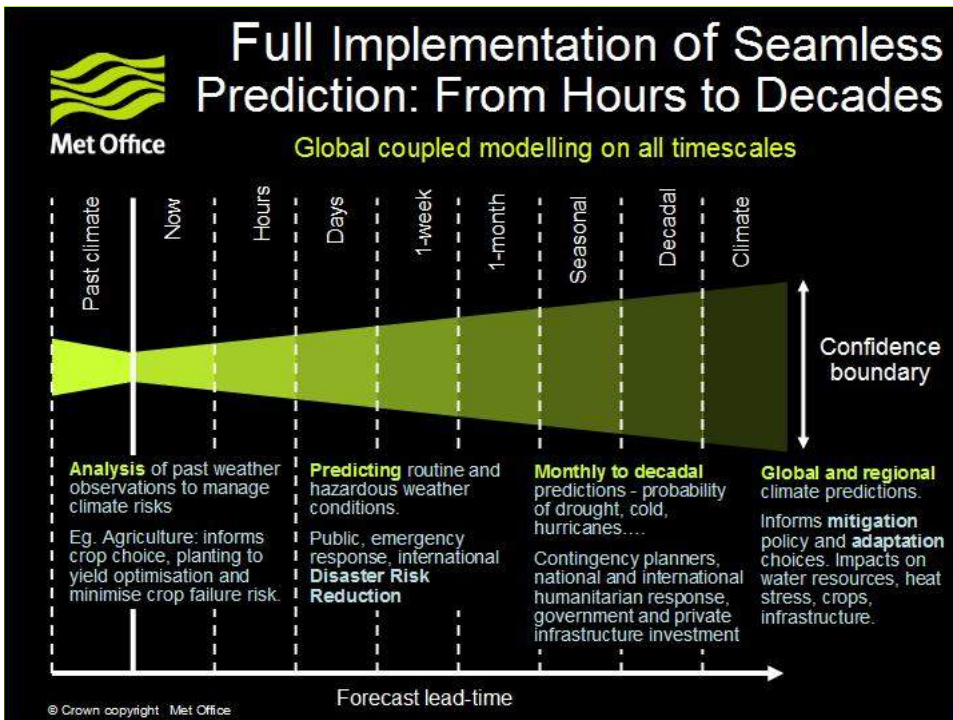
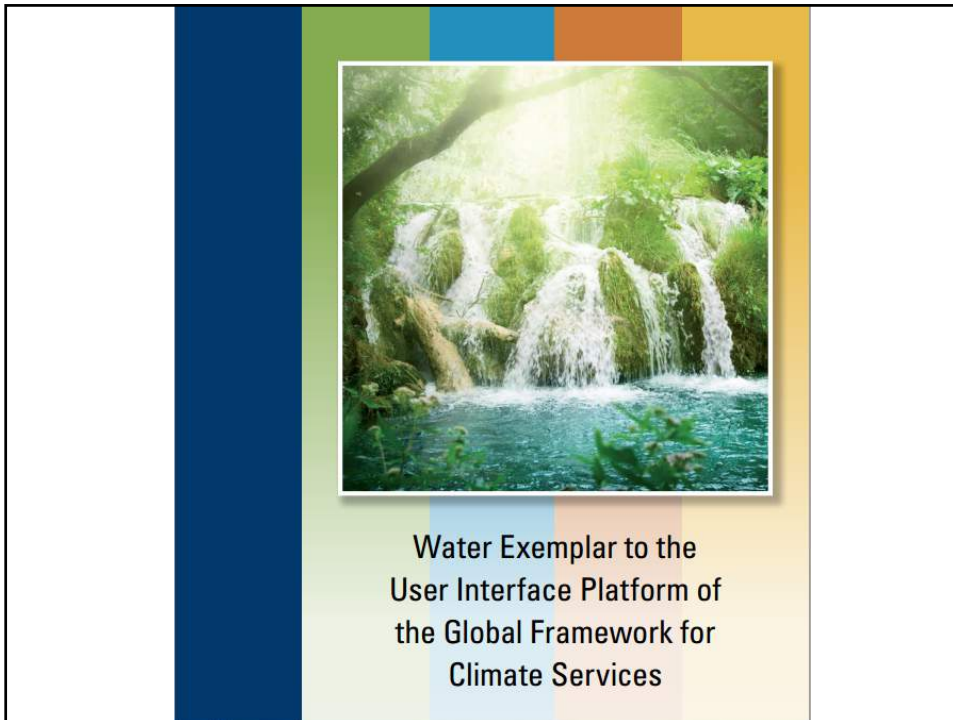


Agriculture and Food Security  
Exemplar to the User Interface  
Platform of the Global Framework  
for Climate Services

### Seminars – Interactions with Farmers

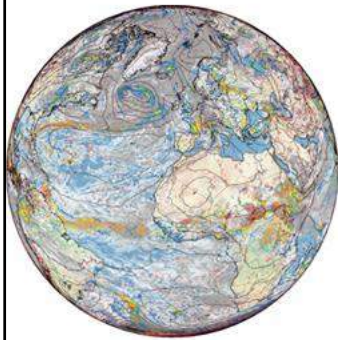


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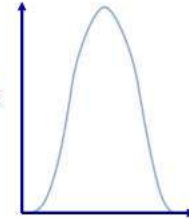
## Full Implementation of Seamless Prediction: From Global to Local and from Weather to Climate



**N x Global predictions  
at ~20km with lead  
times of days to years:  
Synoptic drivers**



**<N x Regional predictions  
at ~1km:  
Local meteorology**



**PDF of local hazard:  
Impacts**



## Key Challenges for the Future



- Preparing for future computing architectures
- Driving down model resolution at the global and local scale... and in the horizontal and vertical.
- From weather and climate to the local environment and global Earth system
- Ensuring the observational base keeps pace with the models – avoiding 'fairyland'!
- Effective translation and application of weather and climate science - from hazard to impact
- International cooperation – sharing data, knowledge and capabilities

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**Need for broader collaboration and cooperation among different development sectors (global, regional, & national levels)**



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Thank you for your attention

[www.wmo.int](http://www.wmo.int)

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