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# **AMAP Climate Expert Group**

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# Adaptation of Actions for a Changing Arctic – AACAC

## St. Petersburg, Russia 22-24 April 2013

- application of climate scenario results for users (economy sectors) . What can climate science suggest to users in various sectors?
- How to meet user needs to analyze consequences of CC on Arctic ecosystems and on social and economic development.
- near term (decadal) and the long term (centennial) projections on increased temperature and ice-melting, consequences for terrestrial and marine ecosystems, biodiversity, human health, transport, socio-economic adaptations.

## After the workshop

- phase 2 of AACAC 2013-2015 with a sector report from each phase 2 expert group. 2015-2016 the AMAP integrated assessment for AACAC is prepared based on each expert group report. The integrated assessment is to be delivered to the Ministerial meeting in 2017.

## Topics to be addressed/Participation in St Petersburg

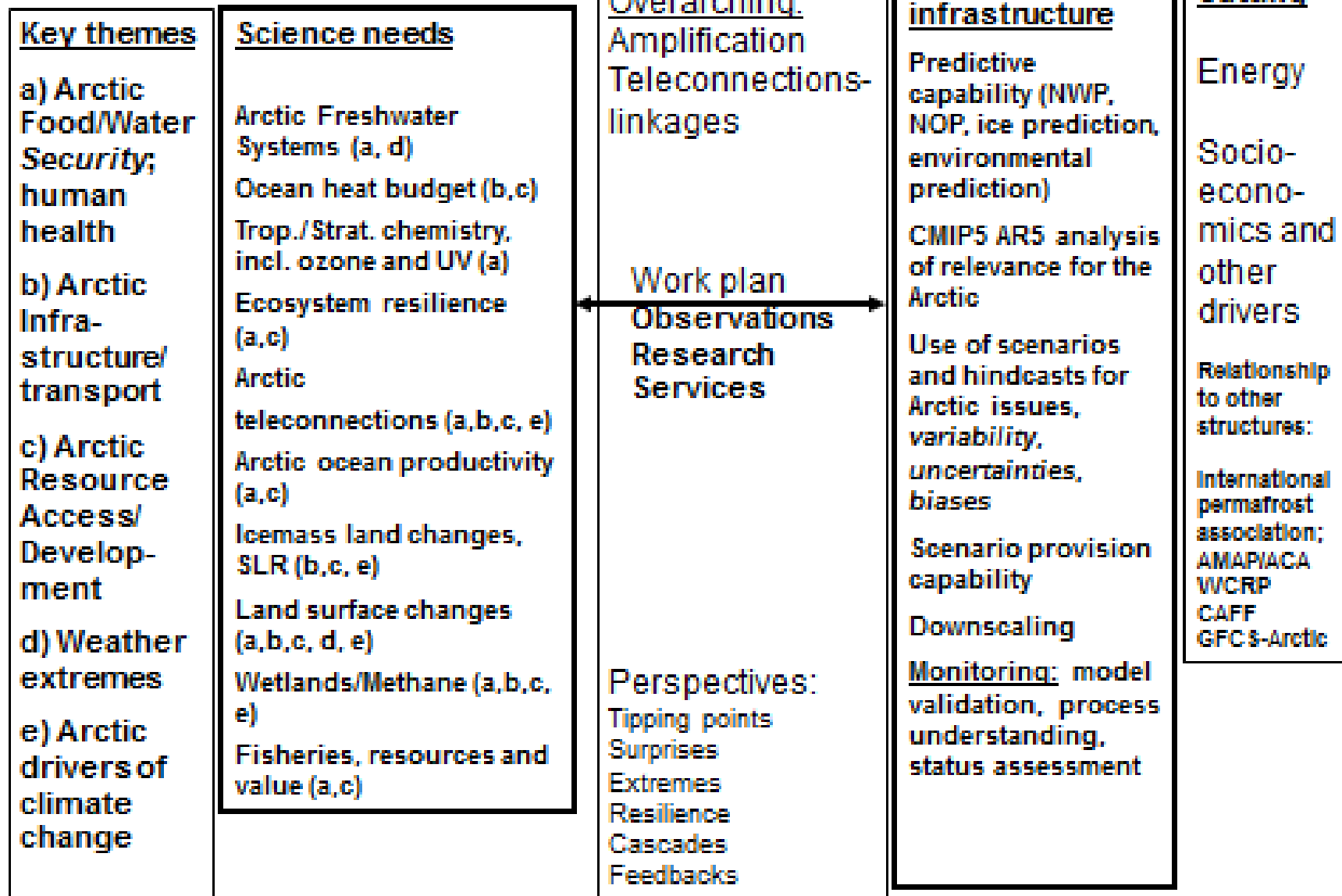
- Experts needed in different disciplines to elaborate a joint input to the integrated assessment. Experts to cover the following topics:
- climate change modelling including ocean acidification
- terrestrial and marine ecosystem (fisheries projections, contaminant uptake and pathways, riverine and atmospheric inputs, flora and fauna responses, permafrost, primary production)
- socio-economic perspectives (mining, tourism, shipping and other means of transport, oil and gas, herding, etc.)
- socio-economic modelling looking into lifestyles and well-being, energy supply, employment, impacts of all this on human health, diet, indigenous perspectives, etc.

## Geographical coverage

- Chukchi Sea/Bering Sea/Beaufort Sea and adjacent coastal and land areas.
- Barents Sea and adjacent coastal and land areas.
- Davis Strait and adjacent coastal and land areas.

# Climate Change (impacts) First and Worst in the Arctic"

## Arctic predictive capability



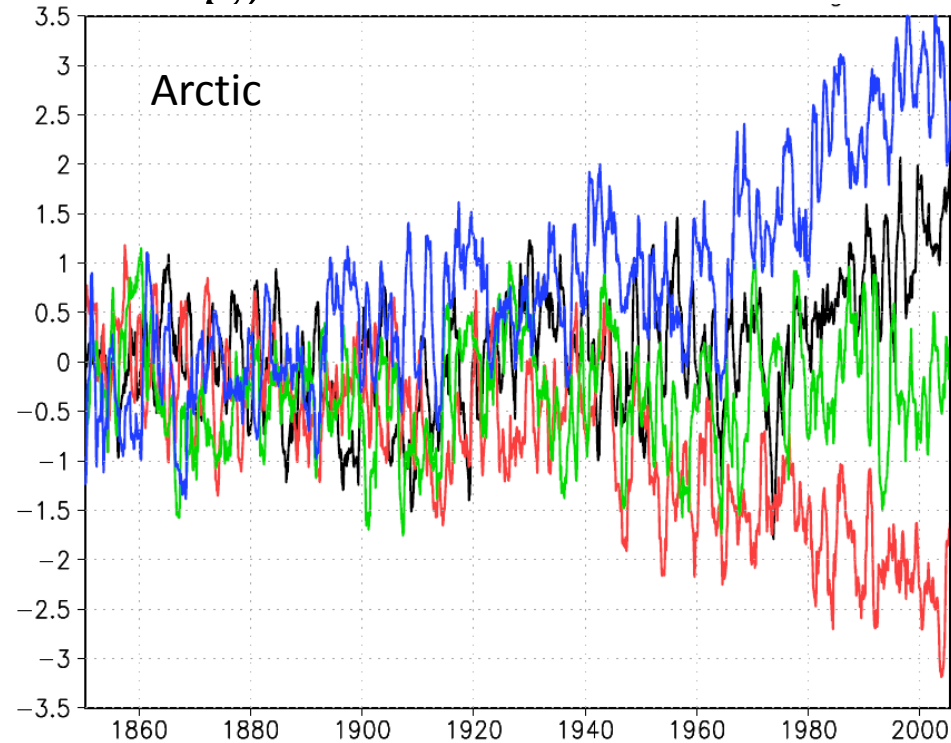
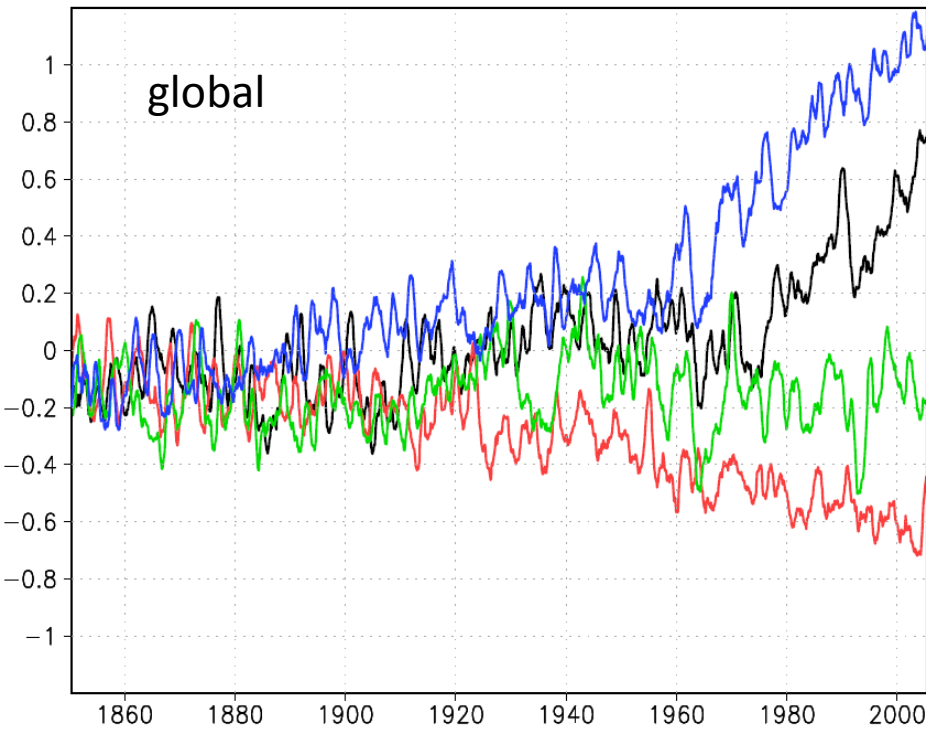
## R&D priorities

parameters, analysis and predictive capability  
observations, processes, modelling

- atmosphere,
- ocean,
- sea-ice,
- climate
- snow,
- sea level,
- permafrost,
- polar contaminants,
- (river and lake discharge and ice
- polar carbon cycle
- glaciers, ice caps,
- Greenland ice sheet,
- Surface properties)
- p.d.f. focus incl extremes
  - wind,
  - temperature,
  - precipitation,
  - fog,
  - icing,
  - Waves (MyWave GMES),
  - currents,
  - Pollution events incl fires
- iceberg drift,
- oil spill drift
- time and spatial scales

# Surface temperature response to forcings by natural factors, anthropogenic GHGs and anthropogenic aerosols

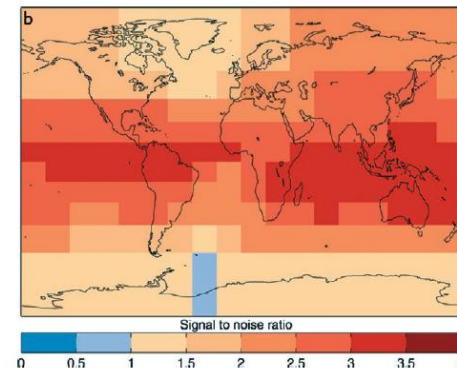
## NorESM (→ GFCS via downscaling)



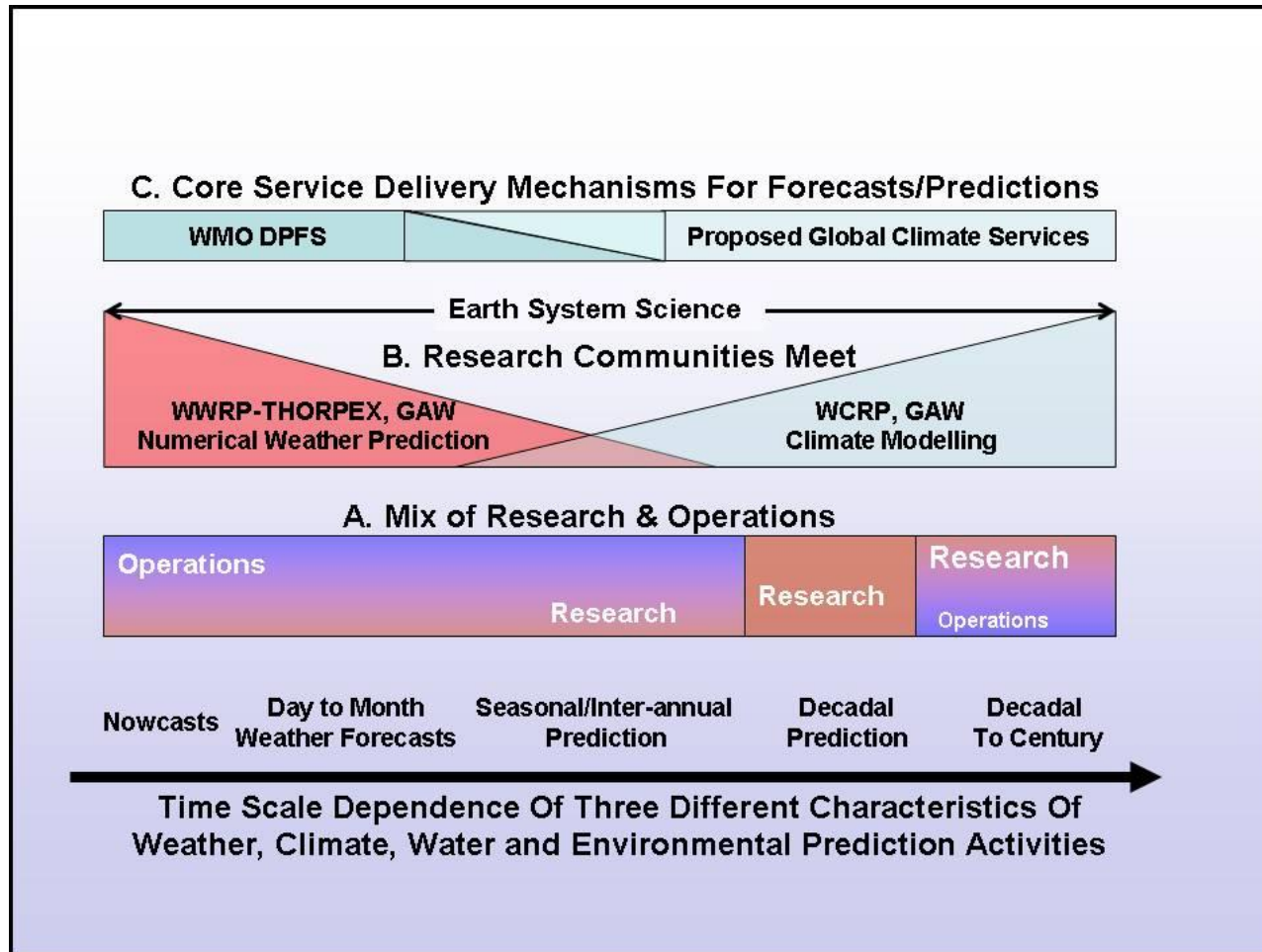
**All forcings**  
**Anthropogenic GHG**  
**Natural (Solar + volcanoes)**  
**Anthropogenic Aerosols**

S/N the fourth decade ahead

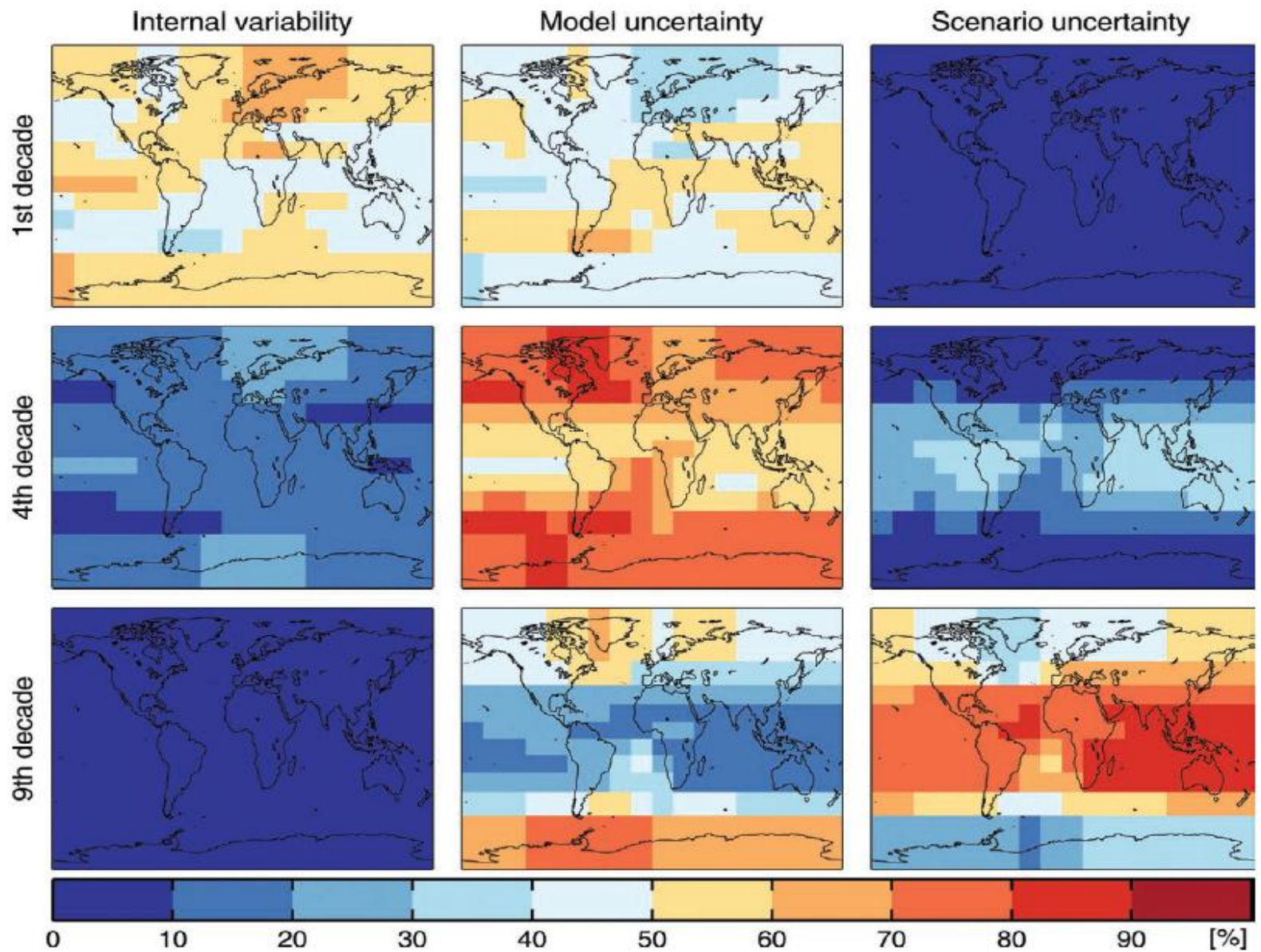
Hawkins and Sutton  
 BAMS 2009



# EC-RTT: WMO between operations, policy and research



Atmospheric composition and health; ecosystems impact; climate change - the cycling of greenhouse gases and interaction with AQ incl SLCF; N<sub>r</sub> cycling; NWP improvement; sand and dust storms (CLRTAP; EU; IPCC; Nitrogen initiative) (WMO Executive Council Task Team (EC-RTT) report April 2009)



Source of uncertainty (%) in climate projections for 1<sup>st</sup>, 4<sup>th</sup> and 9<sup>th</sup> decade into future. (Hawkins and Sutton, 2009)