



World Meteorological Organization
Working together in weather, climate and water

Climate and Ocean Adaptation

M.V.K. Sivakumar

Director

Climate Prediction and Adaptation Branch



Climatic Drivers of Marine Biogeochemistry

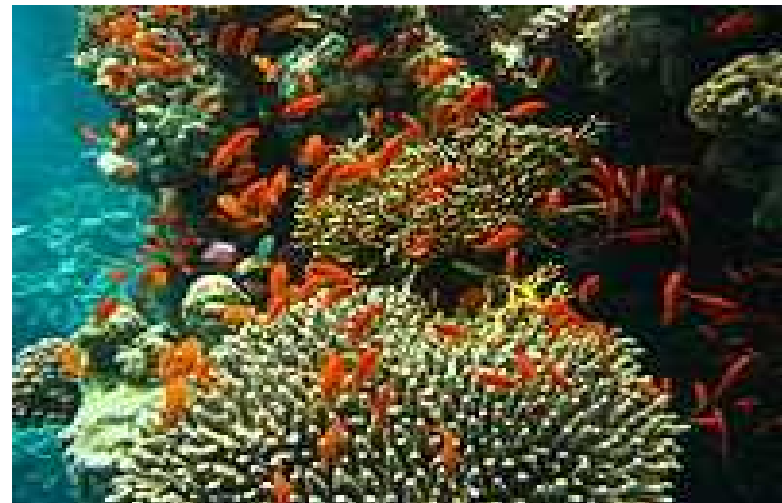
- Atmospheric CO₂
- Temperature
- Circulation
(Advection & Mixing)
- Light Supply
- Dust Deposition
- Rivers Input ...

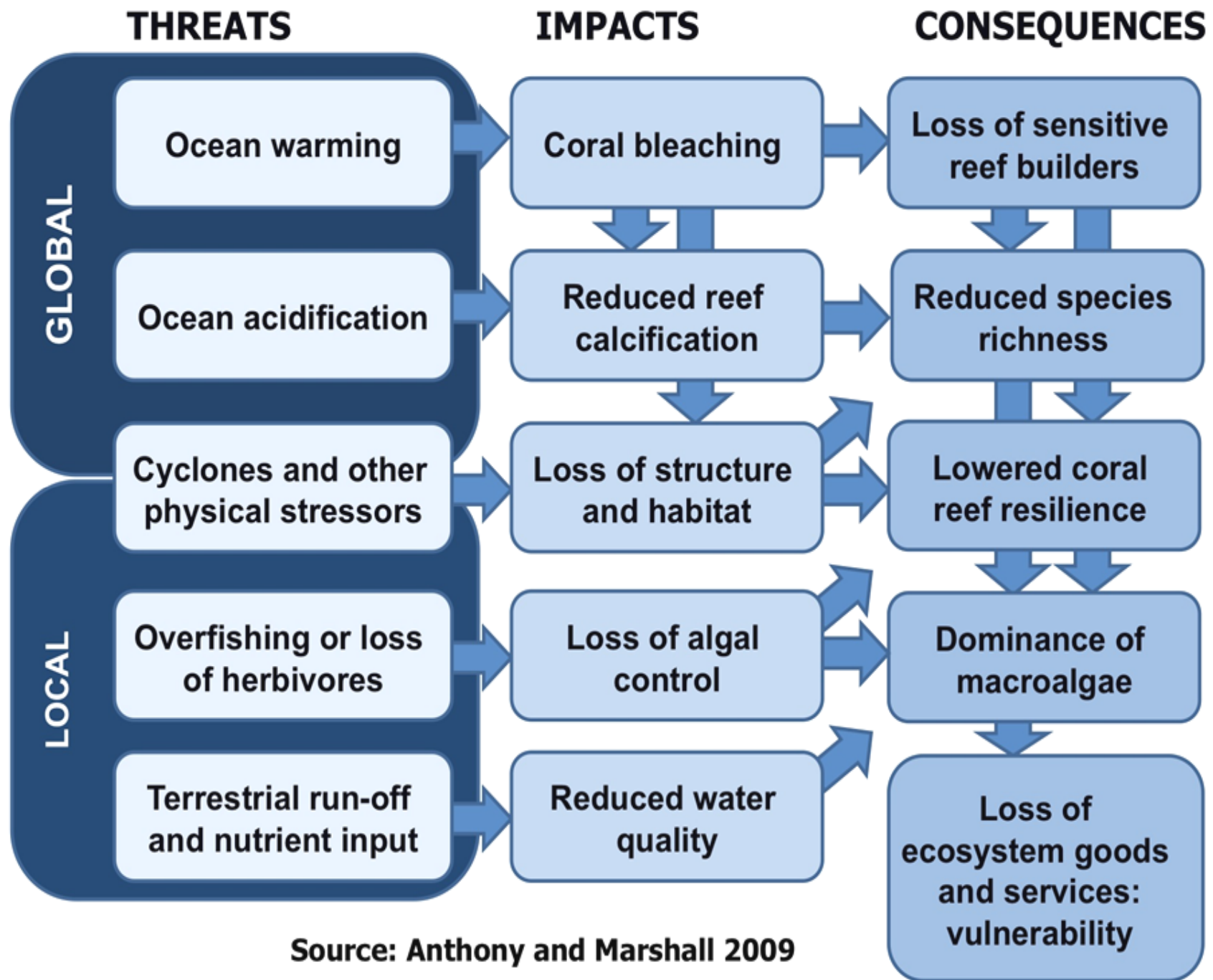




Threats to Ocean Ecosystems due to Climate Change

- Ocean ecosystems are threatened by changes to the environment associated with increased emissions of greenhouse gases, including
 - higher water temperatures,
 - increases in ocean acidification
 - changes in storm surges due to altered cyclone patterns.





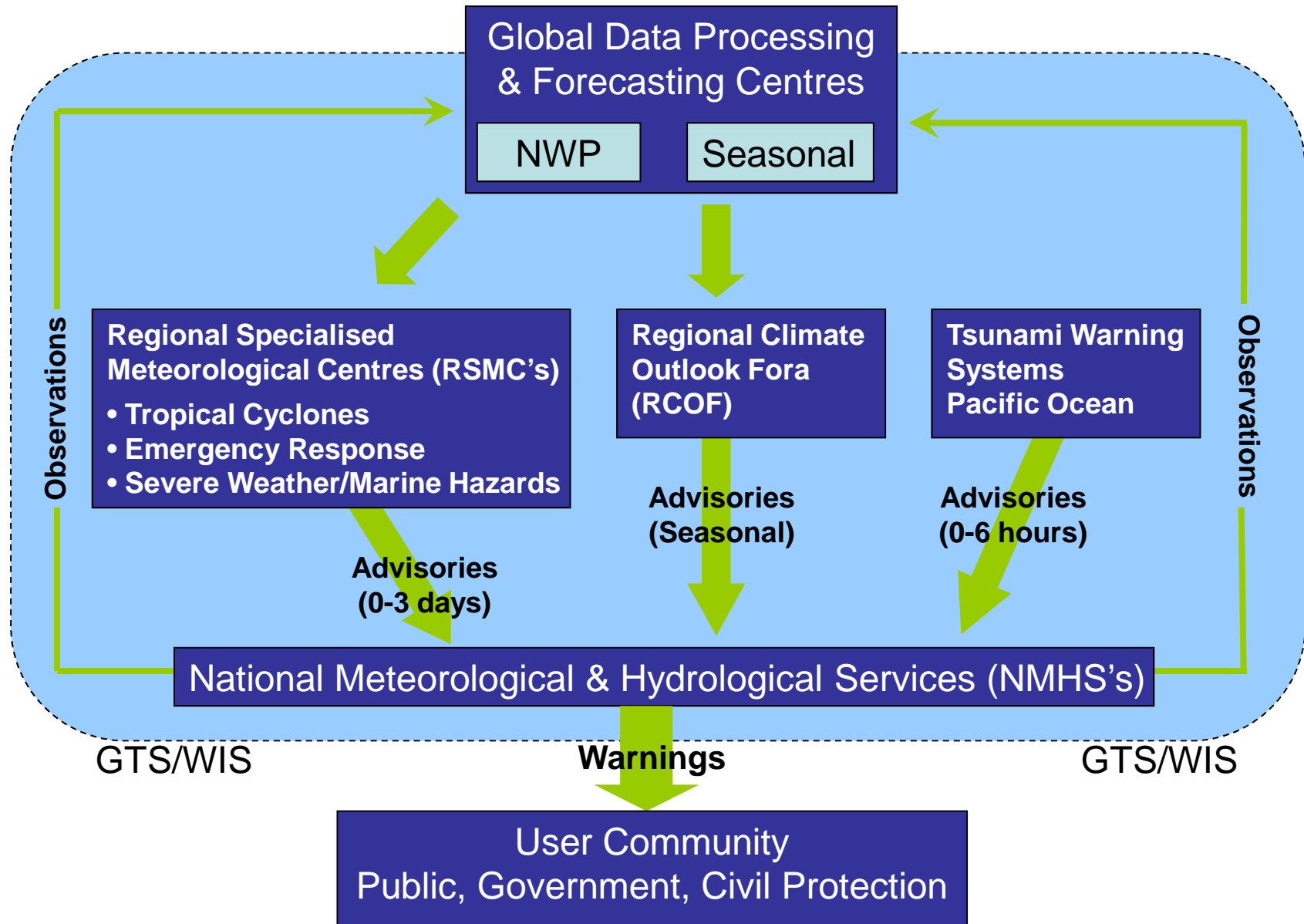
Source: Anthony and Marshall 2009



Role of Meteorological Services in Ocean Adaptation

- Marine meteorological services have traditionally delivered warnings of gales, storms, sea waves and tropical cyclones mainly in support of shipping activities.
 - With growing recognition of the impacts of global change on the coastal ecology, however, meteorological services are increasingly called upon to provide support to real-time oceanography and marine biology.
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WMO Warning System





Marine Meteorology and Oceanography Services

- Maritime Safety Services
 - Marine Pollution Emergency Response System
 - Support to Search and Rescue Operations
 - Operational Ocean Forecasting Systems
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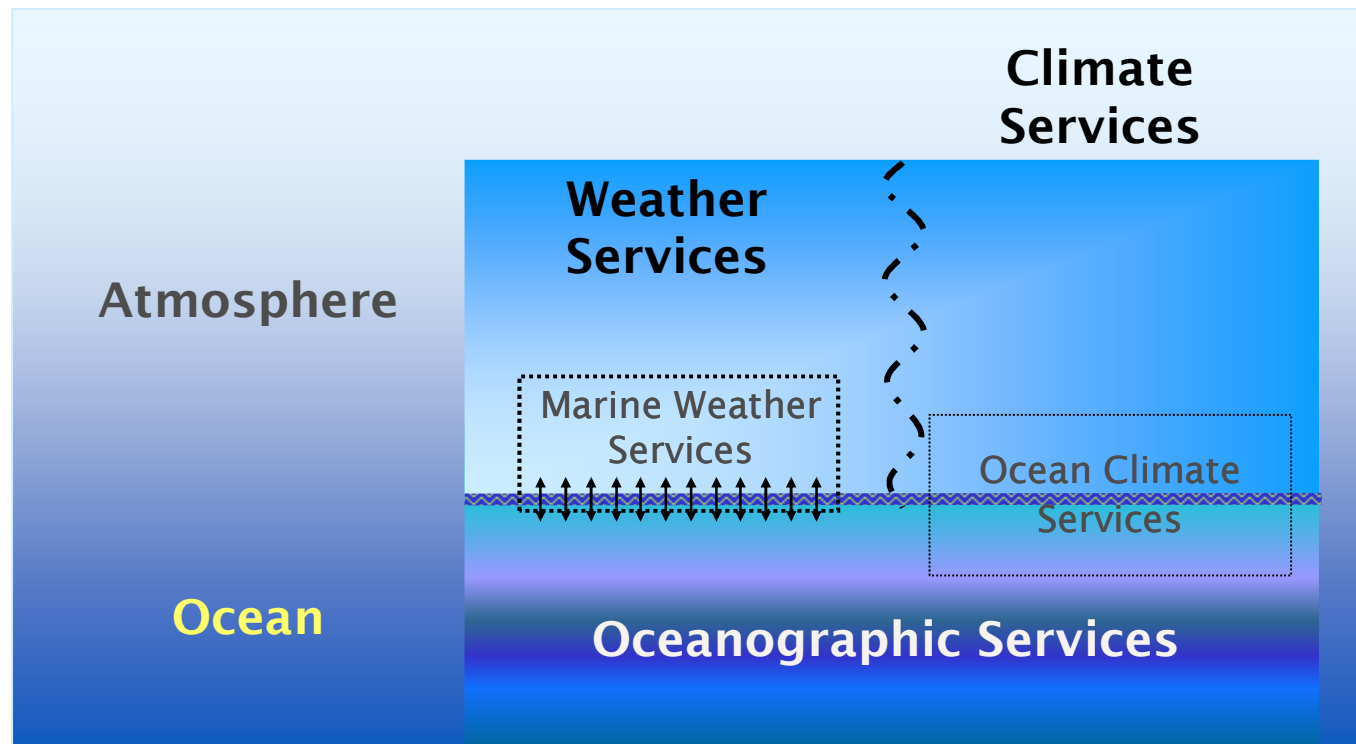


Joint Commission on Oceanography and Marine Meteorology (JCOMM) Concept and Objectives

- NWP, climate studies, maritime services, ocean modeling and forecasting, ocean research, all require integrated metocean data and information streams
 - To address these requirements and realize potential benefits, JCOMM jointly sponsored by WMO and IOC
 - Combines and benefits from the strengths and expertise of the met. and ocean communities, avoids duplication of effort, integrates existing activities
 - User oriented, functions at global, regional and national levels
 - Integrated marine observing, data management and services system; extensive outreach programme
 - An implementation mechanism for global GOOS and in situ marine component of GOS
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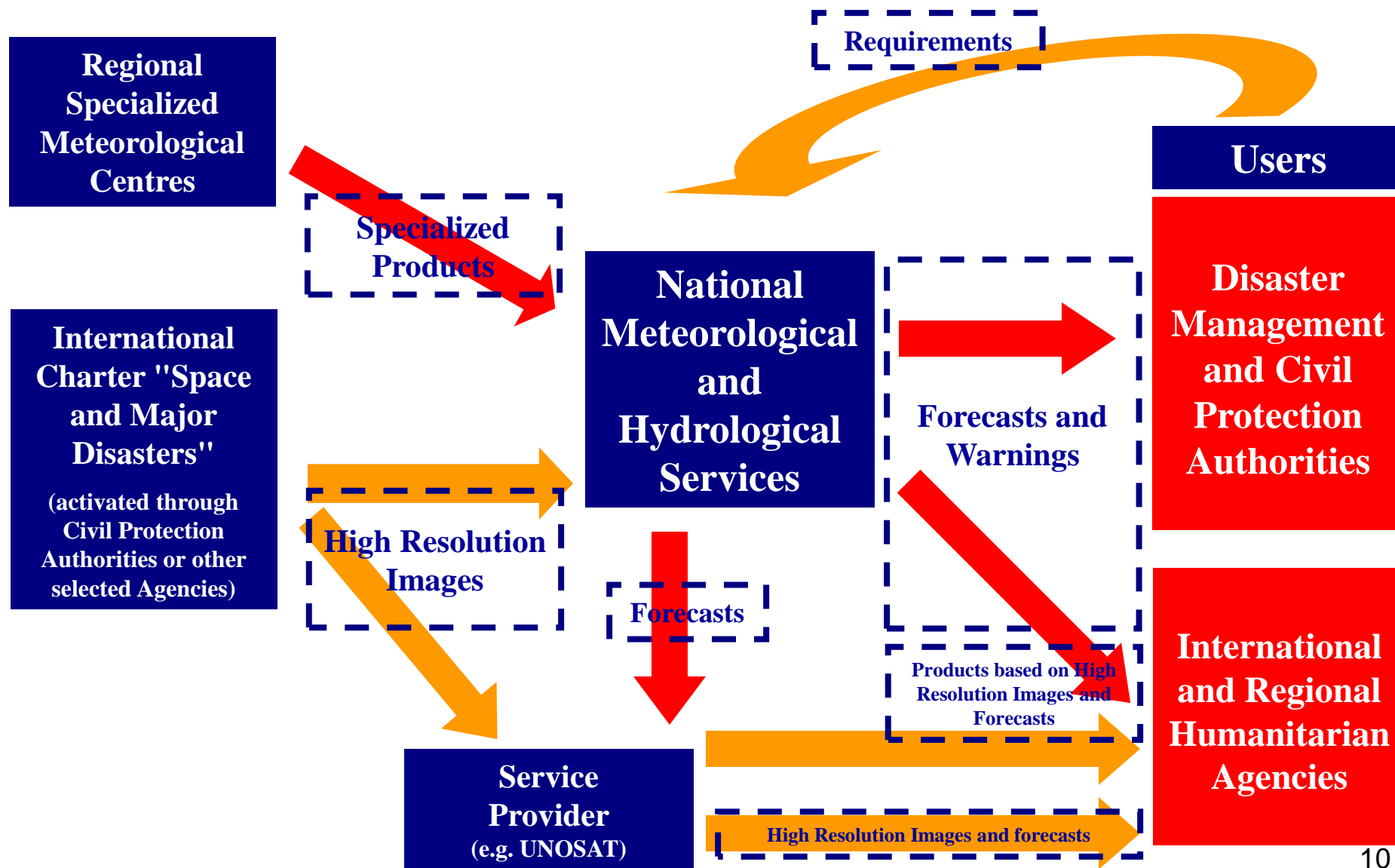
Marine Meteorological and Oceanographic Services

- JCOMM as the bridge between meteorology and oceanography
- Operational oceanography now a reality
- Community welfare, socio-economic impacts, hazard mitigation, climate change, marine environment....
- National and international cooperation essential – IOC, WMO, met and ocean agencies



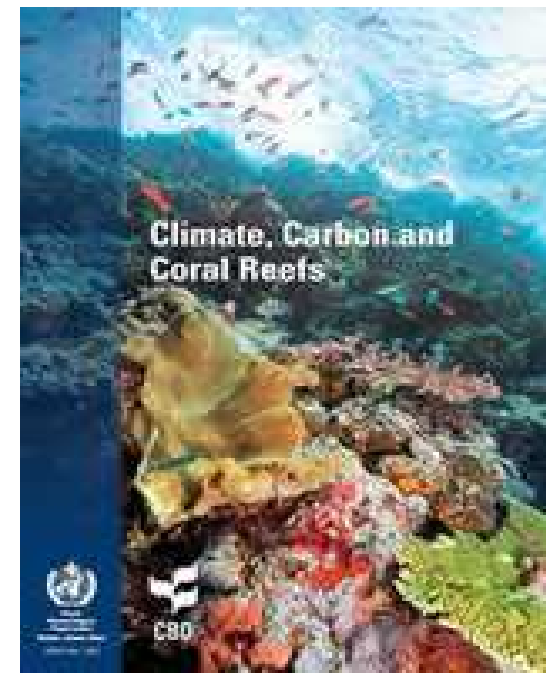
COASTAL INUNDATION FORECASTING DEMONSTRATION PROJECT (CIFDP)

Proposed Scope of the Storm Surge Watch Scheme (SSWS)



WMO/CBD Joint Publication on Climate, Carbon and Coral Reefs

- Illustrates some of the linkages among climate, carbon dioxide and coral reefs, while describing the necessary steps to appropriately assess the threats at the local and regional scales, as well as to devise suitable monitoring, conservation and mitigation strategies.
- Copies are available and being distributed to all participants.





Thank you!
