

# Breakout: Connecting the Coastal Zone



**GLOBAL CLIMATE  
OBSERVING SYSTEM**

KEEPING WATCH OVER OUR CLIMATE



WMO



IOC

International  
Science Council



**UN**  
environment

- Vulnerability of the coastal zone
  - Major economical centers
  - High population density
- **Key Issues:**
  - **Land-Ocean Fluxes**
  - **Regional sea level, coastal impacts**

## Opportunity

UN Decade of the for Sustainable Development

- TOPC
  - Stephan Dietrich – GTN-H.
  - Nigel Tapper (TOPC) Monash– Urban Climate Scientist. Interested in Climate change, Climate Adaptation and Cities. Coastal Retreat, inundation, coastal agricultural lands.
  - Philipp Schöneich - Representative on GTN-P - Permafrost.
  - Claudia Ruz Vargas – International Groundwater Research and Assessment Centre (IGRAC)
  - Huilin Li - Representative on Glaciers and snow.
- AOPC
  - Holdsworth – Lightning. Extreme events.
- OOPC
  - Masao Ishi- JMA-MRI. Carbon Fluxes in the coastal region, nutrients fluxes, upwelling.
  - Maria Paz Chidichimo – Physical Oceanography. Boundary Currents.
  - Johnny Johannesen – Water Cycle as so strongly connected to sea level. Copernicus Marine Services. Coastal that needs more attention.
  - Tony Lee – Satellite Oceanography. Land-sea connections, flooding impact. Coupled coastal ocean and land hydrology model to use upcoming SWOT. Marjolaine Krug – Boundary Currents and interaction with the shelf. Physical Oceanography, Satellites and Gliders, air sea interaction.

# Riverflow and Runoff – key application

- Quantity
  - Importance of buoyancy fluxes for Global Ocean Circulation,
  - consequences for Sea Level Rise
  - Particular issues in the Arctic.
- Quality
  - Important for closing the Carbon Cycle,
  - Oxygen minimum Zones,
  - coastal water quality, ocean health
  - Need for carbon fluxes by runoff (including rivers, groundwater)
- Increased resolution of models into coastal zone, emerging coastal hydrodynamic modelling used for management (e.g. e-reefs).

# Sea Level – key applications

- **Global Long term signal** (OK with Altimetry and GLOSS Tide Gauges ), plus attribution, e.g. tracking Ocean Heat and Freshwater content, glacier melt.
- **Changes in gravity** field due to ice melt, groundwater depletion. (is GRACE= Good enough? What else?)
- **Variability:** Modes? ENSO, IOD, Circulation changes, eg. Boundary Current variability. (Additional tide gauges needed in global network?)
- **Synoptic changes (e.g. storms, cyclones):** The complementarity of data needs to be exploited, to provide fine scale.
  - Core: Altimetry, Tide Gauges,
  - Plus: Ocean salinity, ocean colour (proxy for river discharge: works if signal big, biology isn't significant), gauges.
- Need to connect with WCRP Grand Challenge on Regional Sea Level Change and Coastal Impacts (Upcoming workshop on Coastal Services in Nov).

- **Discharge into the ocean**

- Quantity: GRDC (under auspices of WMO), IGRAC (WMO/UNESCO), data availability issue.

- [Grdc.bafg.de](http://Grdc.bafg.de)

- Quality: GEMS/water Water Quality Data Centre (UNEP): concentrations

- [Gemstat.org](http://Gemstat.org)

- **Snow and ice**

- Glaciers (global monitoring), and GTN-G

- Ice sheets/shelves

- Permafrost

- **Coastal land-use changes**

- Will be available soon through TOPC

- **Tides**

- From Tide Gauges, connection to GLOSS (though local applications).

- **Coastal Winds**

- Scatterometer data has limits within 12kms of the coast.

- Improve availability, QC, coverage through Data Buoy Cooperation Panel, HF Radar, etc)

- **Combined products (reanalysis)**

- e.g. JRA55-DO JMA Reanalysis drive ocean. Including runoff.

- <https://www.sciencedirect.com/science/article/pii/S146350031830235X>

- [https://jra.kishou.go.jp/JRA-55/index\\_en.html](https://jra.kishou.go.jp/JRA-55/index_en.html)

- In situ Coastal Wind data.
  - Mooring Data Archived but not QA-QCd.
  - Big gaps in network
  - Consider other coastal Data Sources.
- River Gauge Data.
  - GTN-H: calculation of volume fluxes, plus fluxes of properties (Carbon, Nutrients, etc)
  - SWOT
  - EO data by AQUAWATCH group (GEO initiative)?
- Groundwater discharge?
  - Monitoring of SSS?
- Coastal assimilation systems. (including available products, potential new projects?)
- Note upcoming activities
  - Connect with WCRP GC Regional Sea Level Rise and Coastal Impact (Workshop on Coastal Climate Services, in Nov).
  - CCI regional sea level closure project.
- Both Panels to consider a joint way forward? Perhaps a working group, or perhaps initially, 1 or 2 small task teams to scope further these topics, next steps?

# HOW STANDARDS PROLIFERATE: (SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)



<https://xkcd.com/927/>



Thank you



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