Breakout: Connnecting the Coastal Zone











- 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











Attendees

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 Assesment Centre (IGRAC)
- Huilin Li Representative on Glaciers and snow.

AOPC

Holdsworth – Lightening. 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-see 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).









Key Variables

Discharge into the ocean

- Quantity: GRDC (under auspices of WMO), IGRAC (WMO/UNESCO), data availability issue.
 - Grdc.bafg.de
- Quality: GEMS/water Water Quality
 Data Centre (UNEP): concentrations
 - Gemstat.org

Snow and ice

- Glaciers (global monitoring), and GTN-•
- 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/S146 350031830235X
- https://jra.kishou.go.jp/JRA-55/index_en.html











Next steps

- 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?





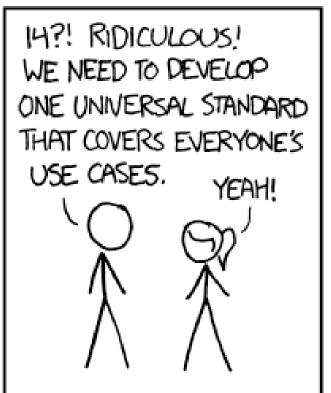






HOW STANDARDS PROLIFERATE: (SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)

SITUATION: THERE ARE 14 COMPETING STANDARDS.



5∞N:

SITUATION: THERE ARE 15 COMPETING STANDARDS.

https://xkcd.com/927/











Thank you









