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Ocean Observations for Physics and Climate panel

The proximity of energetic boundary currents at the shelf edge is a key dynamic in mediating shelf-sea/deep-ocean exchange

- Impacts ecosystem function and productivity on weekly to seasonal scales
- Can drive multi-decadal change in ecosystems (habitats; biodiversity)

Boundary Current mass, heat and salt transports are of leading importance in basin-scale ocean budgets, and need sustained observation

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Boundary Current / Shelf Sea Interaction
Integrating ocean observations across the coastal shelf boundary

Some complementary initiatives/opportunities:

- International “OceanGliders” Steering Team structuring the community at the global scale around 3 scientific axes to which gliders are suited when deployed on a sustained basis:
 - boundary currents
 - storms, hurricanes, typhoons
 - convection and mixing,

- ARCOM (Altimetry for Regional and Coastal Ocean Modeling)
 - Initiative across COSS-TT and Coastal Altimetry community
 - Proposal to ESA to task CryoSat to global coastal ocean for remainder of mission

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Specific issues that a comprehensive (observations and models) Boundary Current/Shelf Sea Interaction study would address:

- Influences of large-scale remotely driven variability
- How boundary currents drive shelf-sea/open-ocean exchange, (including nutrients, carbon export, productivity of shelf waters)
- Response of coastal and BC dynamics to local and regional wind and buoyancy forcing
- Quantifying resolution required to represent coastal and BC dynamics in global climate models
- Obtaining basin-wide estimates of meridional transports through a synthesis of coastal, boundary and open ocean observations

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OOPC action items:

- Present BC/SSI initiative to GODAE COSS-TT (April 2017)
- Develop plan for a BC/SSI Workshop ...

Workshop on Boundary Current / Shelf Sea Interaction: 2017

- Recommend international pilot process experiments in boundary current/shelf-sea regimes to guide development of sustained observation and modeling
- Improve downscaling of climate models to represent higher frequency, smaller scale processes that drive coastal and shelf circulation, and ecosystem response

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Next: Task Team for Boundary Current/Shelf Sea Interaction

- Review previous and on-going boundary current observing experiments / Review existing and novel technologies for coordinated shelf-sea/deep-ocean observation --> Ocean Obs '19
- Recommend intensive international pilot process experiments in specific boundary current/shelf-sea regimes that will guide the development of a sustained observation and modeling system
- Improve techniques for downscaling climate models, including adequate representations of higher frequency, smaller scale processes that drive coast and shelf dynamics and ecosystem response.
- Coordinate with GODAE for state estimation and observing network design (COSS-TT, OSEval-TT, DA-TT, ...)
- Coordinate with GOOS Regional Alliances for regional coastal observing, and ...
- Make connection to societal impacts in the global coastal ocean