West Coast coastal C cycle observing priorities

The Pacific coast of North America is a global hotspot for ocean carbon cycle change and its impacts on marine ecosystems (e.g. ocean acidification and hypoxia), making it a natural laboratory for studying these processes. Priorities for future research:

- **Better constraint on water column metabolism.** We don't have solid estimates for how much production and respiration occur in WC coastal systems or where the NCP ends up. This is critical for understanding development of hypoxic, corrosive, and toxic (HABs) conditions on our coastline.
- **Winter measurements.** In the CCS, winter storm events play a critical role in priming the system for summer P, R, and development of stressful ecosystem conditions through summer.
- **Lateral fluxes.** Both estuary-to-coast and coast-to-open ocean fluxes are critical to understanding the above processes and impacts and need better observational constraint.

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A few specific considerations:

- **Quantify accumulation or loss of C in tidal marsh and other 'blue carbon' systems.**
- **Improve linkages between offshore and nearshore observations.** Often fall under different research programs, but linkages critical for getting whole picture with respect to major coastal C cycle impacts (ocean acidification, hypoxia, etc.).
- **Event-scale observations are important.** Leveraging OOI infrastructure.

West Coast coastal C cycle priorities for integrating observations and modeling

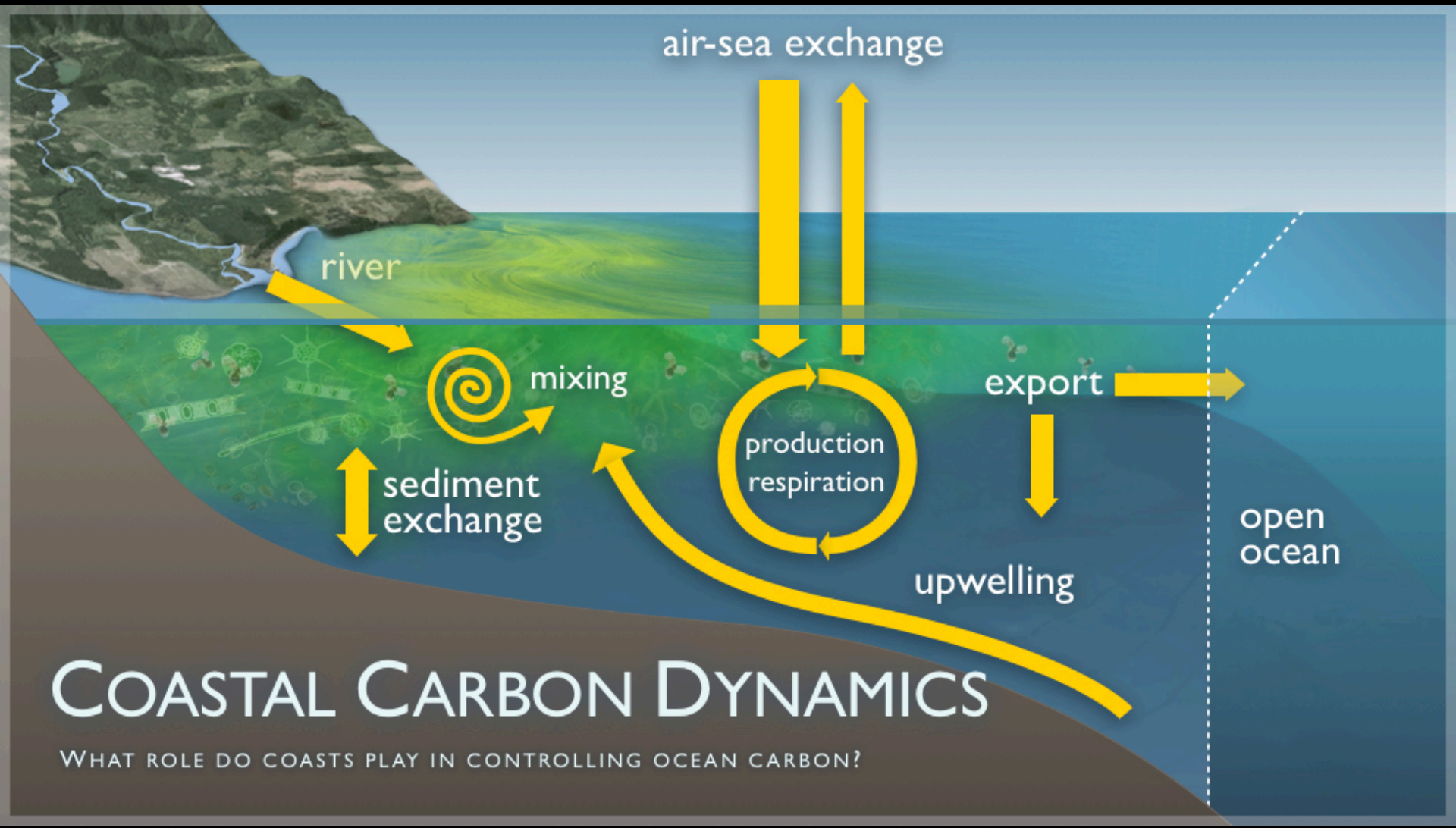
Across the Land-Ocean Aquatic Continuum:

- **Terrestrial inputs.** We made plans to integrate existing information from SPARROW and LOADEST approaches.
- **Tidal wetlands.** Can do C accumulation from stocks and existing geomorphic and statistical models. BUT if we want to know about biogeochemistry (DOC, DIC leakage or CH_4 emissions) – need to develop flux model.
- **Estuaries-coastal oceans.** Important needs: 1) winter inputs of nutrients, buoyancy, and winter PP; 2) trace nutrients (Fe); and 3) freshwater impacts of calcification-dissolution dynamics (Ca).
- **Coastal ocean.** Need development of sediment settling and fate. High-resolution models for nearshore, other hotspots.
- **Coastal-open ocean.** Eddies and filaments are key for transporting nutrients and C to open oceans. Impacts on PP.

West Coast coastal C cycle priorities for integrating observations and modeling

Broader needs:

- **Better communication between terrestrial and marine models.**
- **Human impacts.** Modeling impacts of land-use changes, including restoration, on biogeochemistry.
- Importance of not ignoring fluxes that may not be the largest but have a **management** application.
- **Models of risk assessment** for biogeochemical impacts (e.g. integrated ecosystem assessments).
- **Socioeconomic models.**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COASTAL CARBON DYNAMICS
WHAT ROLE DO COASTS PLAY IN CONTROLLING OCEAN CARBON?