

Shelf Questions

1) What determines dispersal and deposition on a high-discharge, basin-filling shelf?

-Phase I:

-preliminary modeling of bay and shelf using available forcing data to predict areas of high transport and high deposition.

-multibeam mapping to locate areas of fine grained surficial sediments, run chirp contemporaneously to maximize ship time.

-coring for short time-scale radioisotopes (Be-7, Pb-210, Cs-137) to ground-truth the multibeam and identify areas of deposition.

-Phase II:

-put observational instruments (tripods, moorings, and water column casts) in areas identified as transport pathways (from the model and multibeam) and bracketing depocenter.

-coring for longer time-frame radio isotopes

-Phase III:

-analyze timeseries and seabed observations to refine model of transport and deposition.

2) How is the signal of storm-generated sediment input modified during transport and is it preserved in the shelf sediment record?

-Phase I:

-chirp survey to identify high resolution stratigraphic framework

-gravity coring

-sediment analyses: physical properties, correlation with seismic properties, core logging (MSCL), sedimentation rates

-Phase II:

-longer cores: piston cores for correlation with terrestrial record

-Phase III:

-drilling (40-50 m cores) to go further back in time and correlate with terrestrial record (IODP or MARGINS)

-deeper seismics?

3) What are the relative roles of ambient storms and major system perturbations (e.g., tectonic, volcanic, anthropogenic, super-storms) on transport processes and depositional patterns on a high-discharge shelf?

-Phase I:

-consider seismics and cores to seek evidence of changes in distribution patterns

-Phase II:

-numerical experiments to determine which forcing signals leave observable impacts on depositional patterns.

-use observations and insight from other groups to guide numerical experiments

-What is the recent spatial and temporal history of depositional patterns, how does it relate to the modern system, and what drives the changes?

-How is the relationship between small and large events in the catchment preserved in the shelf record?