

SHELF

I. Existing Information

Geophysical

- Single beam naval hydrographic quality bathymetry to upper slope (1980s)
- EM 300 multibeam data seaward of shelf break
- EM 12D multibeam data seaward of shelf break (1993)
- MR1 sonar data seaward of shelf break (1993)
- 3.5 kHz using DGPS early 1990s
 - ~ 4-5 km across shelf line spacing
 - ~10 lines along shelf
- uniboom, but problems with gas masking
- A few chirp lines may be collected in August
- High quality structural work on anticline based on multi-channel seismics

Water column

- 1.5 year record of wave height and period (1980s)
- limited current velocity measurements shipboard ADCP and currents
- CTD casts at anchor stations (turbidity)

Models

- tide model
- global wave model
- global run of NCOM model
- NIWA is developing regional scale circulation model that could be modified to include sed. transport

Samples

- Radioisotopes on scattered multicores and piston cores
- Pb210 at 56-m, 70-m and 90-m.
- Across shelf piston cores (palynology)
- Surface sediment samples (samples are archived)
 - ~50 grab samples
 - Scott Stephens worked on circulation in Poverty Bay

Satellite Data

- TOPEX
- Modes
- SeaWifs

II. Major Gaps

- High resolution multibeam and seismics out to shelf break (meet with slope survey)
- Physical oceanographic observations
- Sediment samples: improved spatial coverage, targeted objectives
- Inter-glacial time scale chronology: long cores, C14 dating
- Understanding of active transport processes that exchange sediment between Poverty Bay, the shelf and beyond.

III. What is needed?

- High resolution multibeam and seismic out to shelf break

- understand stratigraphy and evolution of coastline and rivers
- identifies signature of active processes on shelf
- identify key locations for sampling
- Chirp up river to link system from shelf beyond river mouth.
- Regional-scale physical oceanography model that could be nested into global-scale model.
 - Hourly wave spectra (directional would be nice)
 - Current velocity
 - Wind
 - Near bottom measurements of turbidity in water column and current velocity within 1-m of bed
 - Tripods on depocenter, offshore of it, and nearshore. Model will fill gaps. Perhaps transects.
- Plume model
 - satellite data
 - calibrate for suspended sediment concentration
 - if nepheloid layers
 - thermister chain
 - sediment trap to trace subsurface lenses of suspended sediment
 - river mouth dynamics
 - boundary condition: velocity, concentration, energy, turbulence