

Deep Sea Ecosystem Dynamics

Hydrothermal Vent Benthic Ecology Studies

What can NEPTUNE do for benthic ecologists at hydrothermal vents?

- i) use visual methods
- ii) develop in situ sample processing
- iii) develop sensor-based methods to replace samples.
- iv) integrate observations with instrument based measurements from other disciplines.

What are the questions that remain interesting at hot vents that NEPTUNE can address?

- i) How stable are “islands”? – dynamics of the environment; interaction with other disciplines
- ii) Long-term macrofaunal dynamics: what is the rate of response in the deep sea to habitat change?
- iii) Recruitment issues still remain interesting in the context of the super-and sub-surface dynamics.
- iv) Use of microbes by organisms – can we get a handle on microbial productivity?

Middle Valley offers an interesting setting because it has both sedimented and unsedimented hot vent colonies. Rates and dynamics of community change can be compared to deepsea, hydrate, fjord and Endeavour vent sites.

Approaches:

- Establish two study sites preferably a clam bed adjacent to venting outcrop
- instrument to document environment stability: emplaced thermistors in sediment; emergent thermistor chains; ADVs for current in boundary layer; transmissometers; link to regional seismic and pore pressure studies.
- Establish a biotic monitoring mechanism: an instrument package that can traverse a beam deployed over about 30m would be neat – downward looking camera with chemical sensor package.
- Establish a “manipulation” area where annual experimentation can occur.
- Develop an instrumentation package that allows remote examination of settling particles (i.e. larvae to 50µm size)
- Develop an instrument package that assesses some product of microbial production.