

Letters of Intent: EPR
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Larval retention and dispersion on the East Pacific Rise

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The population dynamics, community structure and gene flow of species living at deep-sea hydrothermal vents depend strongly on migration of their larvae between isolated vent sites. We are interested in quantifying the extent and direction of larval dispersal from vents near 9°N on the East Pacific Rise. We also want to solve the reverse question – i.e., to what extent are EPR vent populations recolonized by their own larvae. Because retention and dispersal of larvae are controlled largely by the oceanic flow field, we propose to model these processes based on dispersion measurements from dye-release (and possibly SF6 tracer-release) studies. However, we know that some larvae can modify their vertical positions, and therefore their dispersal in sheared flow, by swimming. To account for larval behavior we plan to incorporate vertical larval swimming into our dispersal model. We will infer vertical swimming behaviors by sampling larvae near vents at heights between 1 and 200 mab to determine what layers of the deep water column they inhabit at different stages in their larval lives.

We anticipate that this study will require participation in 3 cruises over a period of ~7 months. The dye and tracer will be released and surveyed on Cruise 1, the dye will be resurveyed at 4 weeks on cruise 2, and the tracer will be resurveyed at 6 months on cruise 3. Vertical distributions of larvae in the plankton will be sampled on each cruise.