

## ***Interactive comment on “Species variability and connectivity in the deep sea: evaluating effects of spatial heterogeneity and hydrodynamics” by Lidia Lins et al.***

**Anonymous Referee #1**

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As I have little expertise in the detailed sampling and analysis methods applied in this paper, the following comments focus specifically on the connectivity and transport processes.

P3, L12: The authors state that "nematodes may be passively transported via water currents following resuspension from disturbance events". Is there any information available on how rapidly they are likely to re-settle? The potential for dispersal will be very different depending on whether they sink passively, actively swim back to the seabed or actively swim into the water column (e.g. Palmer (1984) Invertebrate drift: Behavioral experiments with intertidal meiobenthos, *Marine Behaviour and Physiology*, 10:3, 235-253, DOI: 10.1080/10236248409378620).

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There is relevant theory on cross-slope transport in upwelling systems that would provide further insight into the potential for transport of nematodes between the transects. For example, Condie and Sherwood 2006 (*Sediment distribution and transport across the continental shelf and slope under idealized wind forcing. Progress In Oceanography* 70(2):255-270) derive length scales for cross-slope transport (in terms of winds and settling rate) that would suggest how many resuspension events would be required to move nematodes between the two transects.

The authors can fairly easily explore physical exchanges between their two transects in the context of hydrodynamic model particle transport using the online tool [www.csiro.au/connie/](http://www.csiro.au/connie/), which covers the WIM region.

The language used in relation to the hydrodynamics is unusual and sometimes difficult to interpret. For example: Abstract: Presumably "higher hydrodynamics" refers to stronger or more variable bottom currents or bottom stress. P4, L7: "great hydrodynamics" has no meaning. Perhaps "energetic currents". P11, L15: "4.2. (H2) Disturbance (high hydrodynamics) increases habitat heterogeneity"; again "high hydrodynamics" has no obvious meaning. P11, L30: "Our study demonstrated ..... together with a higher hydrodynamic stability"; again higher is not the right word, and this aspect is not actually demonstrated, but only inferred from the sediment characteristics.

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