

Evaluation of DERNIE Study, 2003, by Patrick Townsend, 2/1/ 2015

Dernie, K. M., M. J. Kaiser, E. A. Richardson & R. M. Warwick. 2003. Recovery of soft sediment communities and habitats following physical disturbance. *J. Exp. Mar. Biol. Ecol.* 285:415–434.

Cited in Ecological Effects of the Harvest Phase Of Geoduck (*Panopea generosa* Gould, 1850) Aquaculture on Infaunal Communities in Southern Puget Sound, Washington (as well as other compendiums compiled to support geoduck aquaculture in Puget Sound).

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Note: This article is behind a “pay wall” so it was purchased by Patrick Townsend in order to review it.

Basic conclusions:

- The Dernie study was conducted in a completely different environment from Puget Sound tidelands
- The shellfish industry promotes the Denie study because they claim it shows there is no adverse impact to the tideland environment and that it is recovers rapidly after geoduck harvest
- For muddy-sandy beaches, such as Zangle Cove, Dernie actually comes to the opposite conclusion-- that muddy-sandy beaches still had not recovered by the end of the study, 213 days.
- The Dernie study looked at only the top 10 cm of sediment.
- Geoduck harvesting is to a depth of 3 feet, over 91 cm in depth, so a comparison cannot legitimately be made in any case.

Notes on the Dernie Study

The study tested three types of tidelands – sandy, muddy, and muddy-sandy. Contrary to the assertion of ACERA in the Biological Evaluation, the results for muddy and muddy-sandy environments (similar to geoduck sites) did **not** show recovery by day 213, the end of the study:

All of the clean sand pits had completely refilled by day 105, whereas pools of water were clearly distinguishable in four of the eight disturbed muddy sand and mud sites after day 213.

The two sites that had the lowest rates of infilling were both muddy sand sediments. These sites showed little sign of physical recovery over the duration of the experiment. In addition, the rate of increase of numbers of individuals was slower than at any other sites.

The authors were able to infer that benthic assemblage recovery occurred most rapidly in sand habitats, followed by mud communities, while muddy-sandy communities had the slowest recovery trajectories following fishing disturbance.

The impact on benthic organisms did not show a clear pattern of recovery either:

... certain sites showed only marginal signs of recovery in their numbers of individuals over the duration of the experiment.

The study was not even about geoduck farming, or even shellfish farming:

The scale of disturbance was chosen to be relevant to fishing impacts that occur both intertidally and subtidally. Such activities would include bait digging, hand-raking, suction-dredging and some forms of trawling.

The location was not similar to Puget Sound. The Menai straight is a shallow and narrow straight between the mainland of Wales and Anglesey island. These are completely different geological environments.

Field sites of varying sediment characteristics were studied along the Menai Strait, North Wales, UK.

The disturbance depth was very shallow (about 3 inches) and not similar to geoduck harvest depths of about 3 feet:

At each site, one control plot and one 'disturbed' plot of 1m x 4 m were marked out using steel poles.

On 4 July 2001 each site was visited and the disturbed plot dug out to a depth of 10 cm, marking the beginning of the experiment.

The study lasted 213 days and no further analysis was completed. There is no basis for concluding that muddy and muddy-sandy plots recovery quickly.

Sampling occurred approximately 15, 35, 63, 105 and 213 days (from July to January) following the experimental disturbance.