

Bering Sea Integrated Ecosystem Research Project: B56

Project #:

B56

Title:

Carbon export in the Eastern Bering Sea water column

Principal Investigator and Recipient Organization:

PI: Dr. S. Bradley Moran
Graduate School of Oceanography
University of Rhode Island
Narragansett, RI, 02882-1197
USA

Contract Period and Amount of Funding:

\$20,000

Report Period:

September 30 2008 through April 1 2009

Report Date:

1 April 2009

Lead Author of Report:

S. Bradley Moran

Proposed timeline and milestones within report period:

1. Sample analysis from the 2008 field-work, May 2008-April 2009.
2. Data analysis and modeling January-April 2009
3. Ship sediment traps to Healy for the 2009 field-work
4. Prepare NPRB semi-annual report (Sept-Apr, due Apr 1).

Project Summary:

As part of our process-oriented field study in the eastern Bering Sea, the following specific hypothesis is proposed: *Quantify the export flux of organic carbon associated with MIZ and open-water blooms in deeper waters (outer-shelf/slope), and link carbon export to primary production and benthic oxygen utilization to assess the efficiency of pelagic-benthic coupling associated with seasonal and interannual changes in sea ice extent.* The NPRB funds allowed us to quantify seasonal and interannual changes in POC export under MIZ and open water conditions in the outer-shelf waters using both $^{234}\text{Th}/^{238}\text{U}$ disequilibrium and floating sediment trap techniques.

Progress Summary:

Sediment traps arrays consisting of 5 traps per array were designed, ordered from KC-Denmark, and delivered on time for the BEST spring and summer cruises. We succeeded in deploying the surface tethered, free-floating sediment traps in the upper ca. 100 m of the outer-shelf for short durations (12-24 hours max.) at three stations each in spring and summer. We were successful in deploying these in ice-free areas and nearly ice-free areas, which will compliment under-ice sediment trap sampling conducted by Dr. Rolf Gradinger and we obtained sub-samples from some of his deployments for ^{234}Th analysis. Samples were used for determination of ^{234}Th and POC/N export fluxes. Data reduction is still ongoing at the time of this report submission, though at this stage nearly complete for 2008 field-work (see attached plots). It is encouraging that the sediment trap and U/Th derived particle export fluxes agree to within a factor of 2 or better in most cases.

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Lessons learned and project adjustments: All Sediment trap deployments were successful, though deployment and recovery techniques evolved throughout the cruises to best fit within the Healy's capabilities. We did not lose any equipment during often technically challenging over-the-side operations; as such, no project adjustments were required.

Integration activity: We plan to submit data to the BSIERP Data Manager when our results are finalized. We plan to integrate as much as possible data from sediment traps within our BEST-BSIERP work as well as with other PI's. Drs. Grebmeier and Cooper kindly provided a back-up sediment trap array.

Education and Outreach: We had high-school teacher John Karavias from Walt Whitman High School, Huntington Station, NY, participate on the summer cruise, July 2008. John was supported with NSF ARMADA project funds, communicated via webpage journal (www.armadaproject.org/journals) to high school students, and as part of this effort will be attending the fall AGU meeting in San Francisco in December 2008. The PI also has a new student Matt Baumann who started in September 2008 and is working on this project as part of his M.Sc. thesis research.

Next year's Work plan (not part of the 5 page target length): Our work plan for 2009 is listed in the table below.

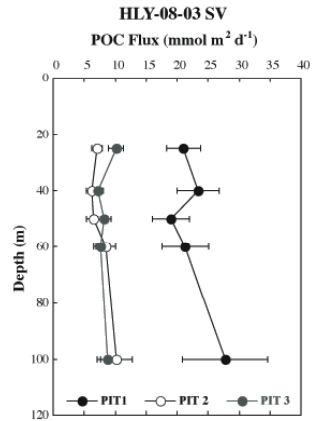
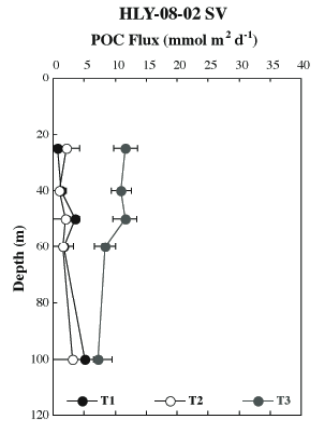
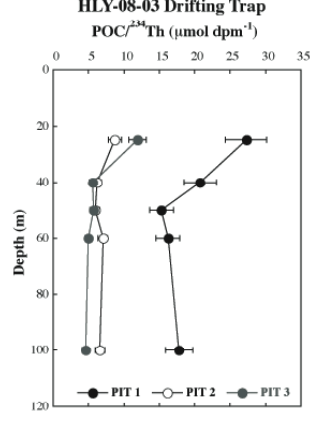
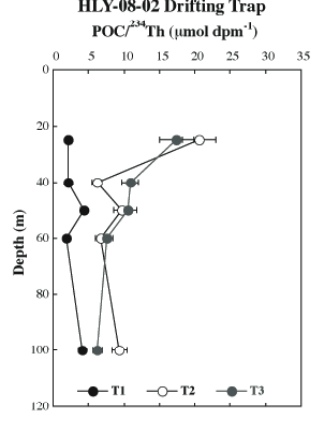
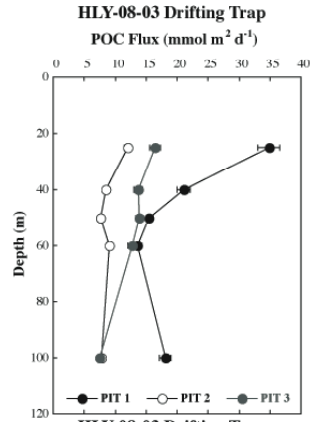
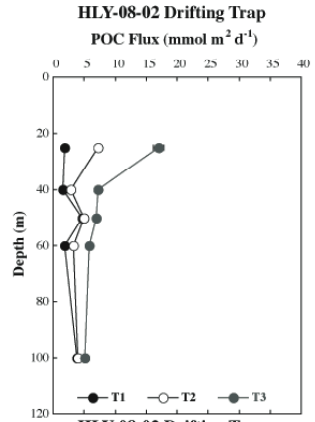
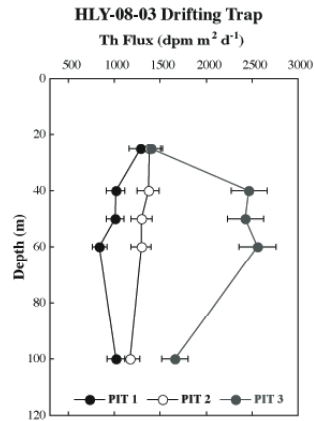
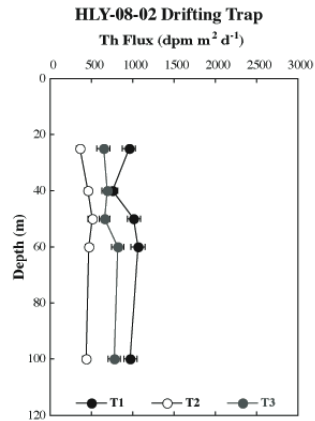
BSIERP

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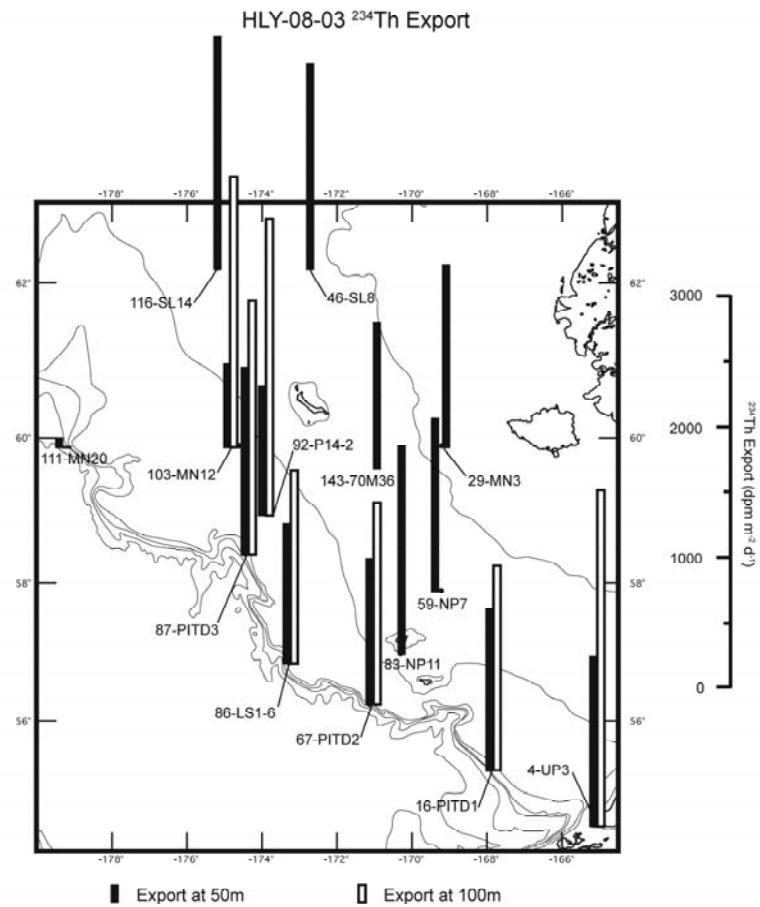
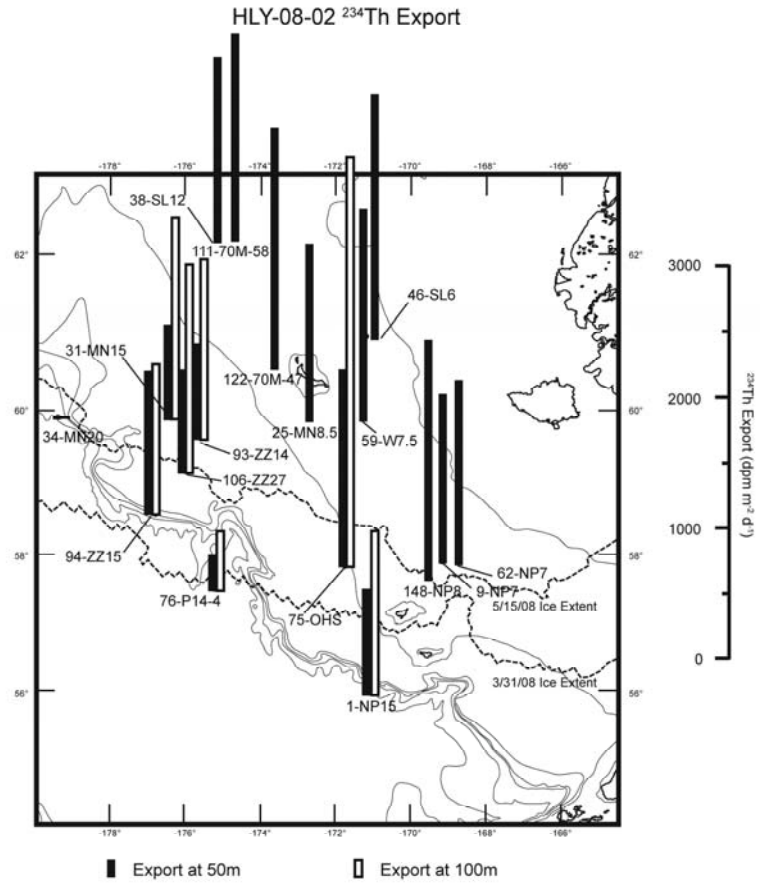
2009-2012 Tasks, Assignments, Timeline

<i>What</i>	<i>Who</i>	<i>Start (2009)</i>	<i>Other key dates</i>
Sediment trap deployments	PI: Moran	Spring and summer	N/A
Sample and data analysis	PI: Moran	All year	N/A

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HLY-08-02 and HLY-08-03 Trap vs Small Volume POC Flux Comparison

