

Sediment trap flux data from two traps deployed from R/V MIRAI at the F1 mooring site offshore from the Fukushima Nuclear Power Plant (FNPP), in the western North Pacific from 2011-2012 (Fukushima Sediment Radionuclides project)

Website: <https://www.bco-dmo.org/dataset/514188>

Version: 06 May 2014

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Project

» [RAPID: Time Series Sampling for Radionuclide and Biogeochemical Fluxes at F1 Time-series Station, Offshore Fukushima Dai-ichi Nuclear Power Facility](#) (Fukushima Sediment Radionuclides)

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Dataset Description

Sediment trap flux data from two traps, at 500 m and 1000 m depth, deployed at the F1 mooring site offshore from the Fukushima Nuclear Power Plant (FNPP), 2011-2012.

Note (06 May 2014): Additional data from this sediment trap will be made available upon completion of further analyses and manuscript publication.

Methods & Sampling

Time-series sampling (from 19-July-2011 to 08-May-2012; refer to data for sampling interval) was undertaken using a standard McLane PARFLUX Mk8 sediment trap. All data were generated in the WHOI PARFLUX laboratory following standard procedures (Eggiman et al., 1980; Honjo et al., 1995). Samples were processed through a 10-position sample splitter and aliquots dried and weighed to obtain mass flux data. Further samples were then digested using standard methods to obtain concentrations per known mass of sample.

Data Processing Description

Sample concentrations (mass/mass) have been multiplied by mass flux results (mass/area/time) to obtain fluxes of different chemical species. Thus concentration of parameter X, is multiplied by mass flux (F-mass) to obtain flux of parameter X (F-X): $F-X = F-mass \times [X]$.

There is one area where processing has led to questionable derived results because [Ca] values were used,

instead of direct analysis, to calculate % inorganic C contents. The offending cells are highlighted in red in the original Excel file at cell AN10 and cell AX10.

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Data Files

File
F1_sed_trap.csv (Comma Separated Values (.csv), 1.64 KB) MD5:b783226130d2208d6d8d79a562659810 Primary data file for dataset ID 514188

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Parameters

Parameter	Description	Units
sample	Sample number.	integer
date_open	Date the sample cup was opened.	mm/dd/yyyy
sampling_period	Sampling interval (number of days open).	days
trap_depth	Depth of the sediment trap.	meters
site	Name of the site.	text
lat	Latitude of the sediment trap.	decimal degrees
lon	Longitude of the sediment trap.	decimal degrees

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Instruments

Dataset-specific Instrument Name	McLane PARFLUX Mark 8
Generic Instrument Name	McLane PARFLUX Mark 8 Sediment Trap
Generic Instrument Description	The Mark 8 Sediment Trap is a time-series instrument that autonomously collects the flux of settling particles on an operator-defined schedule. The wide top funnel accumulates particulate specimens into individual sample bottles. The cone interior is natural polyethylene. Deploys from a stand-alone mooring or a large high-tension vertical array. McLane Mark 8 Data Sheet (PDF) McLane website: https://mclanelabs.com/sediment-traps/

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Deployments

MR11-05_Leg_2

Website	https://www.bco-dmo.org/deployment/512805
Platform	R/V Mirai
Report	http://dmoserv3.whoi.edu/data_docs/Fukushima_Sediments/MR11-05_leg1-2_all.pdf
Start Date	2011-07-17
End Date	2011-08-04
Description	Navigation data and cruise report were obtained from JAMSTEC (http://www.godac.jamstec.go.jp/darwin/datatree/e) on 22 April 2014.

MR12-02_Leg_2

Website	https://www.bco-dmo.org/deployment/511800
Platform	R/V Mirai
Report	http://dmoserv3.whoi.edu/data_docs/Fukushima_Sediments/MR12-02_leg1-2_all.pdf
Start Date	2012-06-24
End Date	2012-07-12
Description	Navigation data and cruise report were obtained from JAMSTEC (http://www.godac.jamstec.go.jp/darwin/datatree/e) on 22 April 2014.

Fukushima_F1_mooring

Website	https://www.bco-dmo.org/deployment/512778
Platform	F1 Mooring
Start Date	2011-07-18
End Date	2012-07-06
Description	Mooring deployed offshore from Fukushima Nuclear Power Plant, Japan. 36°26.5'N, 141°28.5'E, ~1km water depth.

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Project Information

RAPID: Time Series Sampling for Radionuclide and Biogeochemical Fluxes at F1 Time-series Station, Offshore Fukushima Dai-ichi Nuclear Power Facility (Fukushima Sediment Radionuclides)

Coverage: 80km off the coast of Japan

Description from NSF award abstract:

The 2011 Tohoku earthquake off Japan resulted in a tsunami that severely damaged the Fukushima Dai-ichi nuclear power facility. Emergency cooling using seawater, in response to overheating of the facility's reactor units 1, 2 and 3 and uncontained spent fuel pools, has led to run-off of contaminated waters to the adjacent Pacific Ocean that, cumulatively, measure > 10,000 higher than pre-tsunami levels and exceed the release of radionuclides to the marine environment from Chernobyl accident.

With funding through this Grant for Rapid Response Research (RAPID), a research team at the Woods Hole Oceanographic Institution (WHOI) will participate in a JAMSTEC-led cruise in June-July 2011, and deploy a time-series sediment trap mooring at a station 80km off the coast of Japan. The specific goal will be to collect settling particulate radionuclide matter over the coming weeks and months through to an already-scheduled cruise to recover the moorings in May, 2012. By deploying traps at 500m and 1000m, the team will intercept particle-attached radionuclide settling out of the upper ocean and assess their fluxes into the deep ocean interior. They will collect fresh samples approximately every 2 weeks at each depth throughout the sampling period to complement "snap-shot" sampling that will be conducted aboard the JAMSTEC cruise at the start and end of the deployment period.

The team will also collaborate closely with Dr. Ken Buessler at WHOI (already funded separately, including a complementary NSF-RAPID project) who will be responsible for radionuclide analyses of particulate samples at no additional cost to this proposal. This project will handle preparation, deployment and recovery of the time-series sediment trap mooring as well as preliminary sample splitting, characterization of samples for biogeochemical properties and sample archiving. Radionuclides of primary interest at this time include ¹³⁷Cs, ¹³⁴Cs, ¹⁰⁶Ru, ¹⁴⁴Ce and ¹⁴⁷Pm; other species (e.g. Pu isotopes) may also prove to be of interest within the lifetime of the deployment. Thus an important part of the project will also be to stand ready to provide further splits of these well characterized samples to US, Japanese and other interested international research groups in the future, as need arises.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1139902

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