セジメント・トラップに基づく北西太平洋における物質循環に関する研究

1992 Fiscal Year Final Research Report Summary

Study on material circulation in the northwest Pacific Ocean based on sediment trap.

Research Project

Project/Area Number

02303007

Research Category

Grant-in-Aid for Co-operative Research (A)

Allocation Type

Single-year Grants

Research Field

Stratigraphy/Paleontology

Research Institution

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Project Period (FY)

1990 – 1992

Keywords

Sedement trap / Flux / Japan Trench / Northwest Pacific / Material circulation

Research Abstract

The oceanic trenches are the last unexplored region of the global environment. We have been continuing a time series of sediment trap experiments in the deepest part of the Japan Trench since August 1986. One trap was set 400 m above the bottom and other was set at the mid-depth of 4-5000 m. Two more traps were added at about 1000 m and 3500 m water depths since 1990. The following main results were obtained.

1) Vertical flux of total mass and organic materials in the trench areas were relatively higher than those measured in other oceanic areas.
2) A significant temporal variation of total particle flux was observed, but it is not simply related with the surface productivity.
3) In general, the deeper trap collected more materilas than the shallow one, indicating transportation of resuspended matter from the trench slope.
4) High fluxes of resuspended matter are suggested by the analysis of radio-isotopes, organic material composition, as well as microfossil tests such as coccolith and foraminifera.
5) Planktonic tests such as diatom, radiolaria, coccolith, foraminifera, and palynomorph show distinct seasonal variations in their fluxes and species compositions. They are affected by the production rate in the surface layer, dissolution rate of the calcium carbonate, and changes of the water mass above the traps.
6) Oxygen and carbon sotopic measurements of individual spciemens of foraminifera indicate that the isotopic compositions of the test are essentially controlled by the temperature and carbon isotope of the sea water in which the specimen grew.

Research Products (16 results)

All Other

All Publications (16 results)

[Publications] Oba,Tadamichi: "Cxygen and carbon isotopic composition of planktonic foraminiferal tests collected with sediment traps from the Japan Trench." La mer. 29. 190-192 (1992)

[Publications] 大場 忠道: "房総半島沖の日本海溝域における現生浮遊性有孔虫群集" 化石. 52. 12-19 (1992)

[Publications] Tanimura,Yoshihiro: "Seasonal changes in flux and species composition of diatines:sediment trap results from the northwest Pacific.August 1986-November 1988" Bull.Natn.Sci.Mus.Tokyo,Ser.C.18. 121-154 (1992)

[Publications] Aoki,Saburo: "Moaern sedimentation in the Japan Trench:implications of the mineralogy and chemistry of clays sampled from sediment traps" Mar.Geol.108. 197-208 (1992)

[Publications] 松岡 数充: "日本海溝のセヂメント・トラップJT-03試料中に認められるパリノモルフ群集の季節変化" 長崎大学教養部紀要.自然科学篇. 32. 221-233 (1992)

[Publications] Handa,Nobuhiko: "Diel photosynthetic production of cellular organic matter in natural plankton population 1.Monosaccharides." Mar.Biol.112. 175-181 (1992)

[Publications] Oba,T.: "Oxygen and carbon isotopic composition of planktonic foraminiferal tests collected with sediment traps from the Japan Trench." La mer. 29. 190-192 (1992)

[Publications] Sakugawa,H., N.Handa and K.Yagi: "Distribution of glycosylglycerols and oligosaccharides in the marine environment and their ecological significance in the deep sea." Mar. Biol.106. 309-313 (1990)

[Publications] Handa,N., T.Nakatsuka, M.Fukuchi, H.Hattori and T.Hoshiai: "Vertical fluxes and ecological significance of organic materials during the phytoplankton bloom in austral summer of Breid Bay, Antarctica." Mar. Biol.112. 469-478 (1992)

[Publications] Handa,N.: "Diel photosynthetic production of cellular organic matter in natural phytoplankton population 1. Monosaccharides." Mar. Biol.112. 175-181 (1992)

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[Publications] Handa,N.: "The dynamic changes of stable isotopic ratios of carbon and nitrogen in suspended particles during a phytoplankton bloom." J. Mar. Res.50. 267-296 (1992)

[Publications] Handa,N.: "Sulfate reduction using methane in sediments beneath a bathyal "cold seep" giant clam community of Hatsushima." Earth Planet. Sci. Letters. 110. 39-50 (1992)

[Publications] Handa,N.: "Diel variation of water-extractable carbohydrate composition of natural phytoplankton population in Kinu-ura Bay." J. Exp. Mar. Biol. Ecol.157. 1-18 (1992)

[Publications] Aoki,S.: "Modern sedimentation in the Japan Trench: implications of the mineralogy and chemistry of clays sampled from sediment traps." Mar. Geol.108. 197-208 (1992)

[Publications] Tanimura,Y.: "Seasonal changes in flux and species composition of diatoms: sediment trap results from the northwest Pacific, August 1986-November 1988." Bull. Nath. Sci. Mus., Tokyo, Ser. C. 18. 121-154 (1992)