

The following application was submitted to the MARGINS Office:

Name:

Roger Flood

Category: Professor

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Statement of interest:

The surface of the modern shelf represents a very important stratigraphic horizon: that of today. It is this horizon that can be directly linked to modern sedimentary processes and which shows the degree to which past events (e.g., uplift and erosion) influence present-day sediment distribution and movement. We have been studying this stratigraphic horizon on the US east and west coasts using high-resolution multibeam techniques that provide detailed information on surface topography (including bedforms) and backscatter (related to sediment character) over large distances (10s of km). These studies have been supplemented with grab sampling and, more recently, stereo photography to provide "ground truth" information on the nature of the features revealed by the multibeam. Our studies have used the portable Simrad EM3000 which is effective in water depths from a few m to 60+ m, and which can be run in a "dual-head" mode to increase swath width. Resulting bathymetry data has as a nominal vertical accuracy of about 5 cm.

I am very interested in understanding surface morphology and sediment distribution patterns at a small scale but over a large area in Poverty Bay and the adjacent inner shelf off the Waipaoa River in order to better understand the mechanisms important for the distribution of river-derived sediment in these areas. The Waipaoa River occasionally has suspended sediment loads that are high enough to generate hyperpycnal flow, but it is not known how far such flows are able to travel underwater as distinct entities or where they may deposit sediment. These will depend on several features of the submarine morphology, including the bottom slope and the presence and character of any underwater

channels. At present the fine-scale morphology of this nearshore region is only poorly known. Sediment transport pathways at times of high discharge (but not hyperpycnal flow) will also be affected by bottom topography. Also of importance are the underwater features created by tectonic activity on this active margin as well as other kinds of features such as pock marks. In particular, sediment transport pathways in Poverty Bay may change over time in response to tectonically-induced topographic changes. It is necessary to know detailed bathymetry, supplemented by surface-sediment sampling and bottom photography, in order to correctly understand the sediment pathways and sediment dynamics in this important area, and thus the links between the stratigraphic record on the shelf and the processes occurring on land.

If desired I can present a summary of our past studies using this approach and the significance for Waipaoa studies. Hopefully there will at least be an opportunity for posters or other ways of presenting related results and ideas.

Short resume:

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EDUCATION

S.B.: Earth and Planetary Sciences, Massachusetts Institute of Technology, 1972.
Ph.D.: Oceanography (Marine Geology), MIT/WHOI Joint Program in Oceanography, 1978.
NATO Post- Institute of Oceanographic Sciences, Taunton, England, 1978-1979
Doctoral Fellow

WORK EXPERIENCE

1998-present Professor, MSRC, Stony Brook University (name changed).
1988-1998 Associate Professor, Marine Sciences Research Center, SUNY Stony Brook.
1987-1988 Research Scientist, Lamont-Doherty Geological Observatory.
1979-1987 Research Associate/Associate Research Scientist, LDGO.
1972-1978 Graduate Research Assistant, Woods Hole Oceanographic Institution.
1971 Summer Student Fellow, Woods Hole Oceanographic Institution.
FIELD EXPERIENCE: Participant in over 25 deep-sea, coastal and riverine oceanographic research cruises since 1970, more than seven as Chief or Co-Chief Scientist.

MEMBERSHIPS

American Geophysical Union (1971-present)
Geological Society of America (1973-present)
Sigma Xi (1975-present)
Society of Economic Paleontologists and Mineralogists (1983-present)

CURRENT RESEARCH

Sedimentary processes in the deep sea, continental shelf, coastal regions, and Great Lakes

High-resolution swath bathymetry and backscatter mapping in shallow water

Morphology and dynamics of fine-grained sediment bed forms

Sedimentation patterns in the Hudson River, Estuary and Harbor

Relationships between sedimentation processes and contaminant distributions

Growth process of deep-sea fans and continental margins

Sediment acoustics

SELECTED PUBLICATIONS (* relevant to Waipaoa research)

*Flood, R.D. and Johnson, T.C., 1984. Side-scan targets in Lake Superior -- evidence for bed forms and sediment transport. *Sedimentology*, 31: 311-333.

*Flood, R.D. and Bokuniewicz, H.J., 1986. Bottom morphology in the Hudson River Estuary and New York Harbor. *Northeast Geology*. 8: 130-140.

*Flood, R.D., 1994. Abyssal bedforms as indicators of changing bottom current flow: examples from the U.S. East Coast continental rise. *Paleoceanography*, 9: 1049-1060.

Brownawell, B.J., Flood, R.D. and Wang, X., 1994. The role of seasonal resuspension in contaminant cycling in Lake Ontario. *Great Lakes Research Review*, 1: 29-35.

*Ryan, W.B.F. and Flood, R.D., 1996. Side-looking sonar backscatter response at dual frequencies. *Marine Geophysical Researches*, 18: 689-705.

Hawley, N., Wang, X., Brownawell, B. and Flood, R.D., 1996. Sediment resuspension in Lake Ontario during the unstratified period, 1992-1993. *Journal of Great Lakes Research*, 22: 707-721.

Flood, R.D. and Piper, D.J.W., 1997. Amazon deep-sea fan: relationship to equatorial climate change, continental denudation and sea-level fluctuations. In: Flood, R.D., Piper, D.J.W., Klaus, A. and Peterson, L.C. (eds), *Proc. ODP, Sci. Results*, 155: College Station, TX (Ocean Drilling Program), 653-675.

*Ferrini, V.L. and Flood, R.D., 2001. Sedimentary characteristics and acoustic detectability of ship-derived deposits in western Lake Ontario. *J. Great Lake Res.*, 27: 210-219.

Giosan, L., Flood, R.D. and Aller, R.C., in press. Paleoclimatographic significance of sediment color on western North Atlantic drifts: I. Origin of color. *Marine Geology*.

Giosan, L., Flood, R.D., Grutzner, J., Mudie, P., in press. Paleoclimatographic significance of sediment color on western North Atlantic drifts: II. Plio-Pleistocene sedimentation. *Marine Geology*.

GRADUATE STUDENTS

Students in last five years: Xintai Wang (MS), Heather Bittner (MS), Jingguo Zhang (MS), Liviu Giosan (PhD), Laurie Zaleski (current MS student), Yutao Guan (current MS student), Vicki Lynn Ferrini (MS, current PhD student)

Total: 4 PhD, 7 MS.

ADVISORS

Graduate Thesis Advisors: Charles D. Hollister (WHOI) and John B. Southard (MIT)

Post-Doctoral Advisor : Keith R. Dyer (Plymouth, UK)

COLLABORATORS

J. Damuth (UT Arlington), W. Showers (NCSU), A. Shor (NSF), L. Keigwin (WHOI),
N. Hawley (GLERL), R. Stoll (LDEO), L. Mayer (UNB), D. Chayes (LDEO), W.B.F.
Ryan (LDEO)

ODP Leg 155: W. Showers, J. Damuth, W. Normark (USGS), R. Hiscott (Memorial
University), D.J.W. Piper (AGS, Halifax), P. Manley (Middlebury College), C.
Pirmez (Shell)

ODP Leg 172: L. Keigwin (WHOI), B. Haskell (Michigan), E. Laine (Bowdoin), W.
Chaisson

MSRC/STRATAFORM: C. Nittrouer (U. Washington)

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ABSTRACT

Title:

Authors:

Abstract:

Wish to include graphics:

Server protocol: HTTP/1.1

Remote host: backscatter.msrc.sunysb.edu

Remote IP address: 129.49.65.120