The following application was submitted to the MARGINS Office:

Name:
Kathleen Marsaglia

Category: Professor

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Statement of interest:
The science plan for the Margins Source-to-Sink program emphasizes the need to comprehend the linkages between terrestrial to marine components of selected dispersal systems in order to form an integrated, predictive model for the production, transport, accumulation and preservation of sediment along continental margins. Integral, but understated in this science plan is the need to understand and model sediment composition across continental margins, particularly as it relates to the linkages among terrestrial and submarine depositional systems. Most previous sand provenance studies (e.g., Cavazza et al.,1993; Critelli et al., 1997; Girty et al., 1988; Grantham and Velbel, 1988; Heins, 1993; Ingersoll, 1990; Ingersoll et al., 1993; Johnsson and Stallard, 1988; Mack, 1981; Marsaglia, 1993: Marsaglia et al., 1995, 1999; McBride and Picard, 1987; Palomares and Arribas, 1993; Picard and McBride, 1993; Potter, 1994; Sedimentation Seminar, 1988; Suttner et al., 1981) have addresse!
d only parts of the source-to-sink system; there have been no studies that adequately characterize the whole system, integrating possible effects of climatic, tectonic, and eustatic change. An actualistic model for sand provenance from source to sink in the Waipaoa Sedimentary System (WSS) could be used to evaluate the "signals" preserved in older Holocene to Miocene sand-bearing sections currently exposed in the WSS drainage basin or preserved in offshore basins. This was the basic premise of the research project I proposed to NSF as part of the OEDG program meant to enhance diversity in the Geosciences. The proposal was successful, and I have been funded to supervise several student research projects in the Waipaoa region. My first MS student (Dawn James) and I completed a 3-week field season (June 2002) where she sampled

modern stream samples from the WSS. A second field season involving several new students is planned for June of 2003. Results from these studies wil!
l be integrated with other WSS projects. Thus I have an acti!
ve research interest in the WSS and believe I could make a significant contribution to the workshop.

Short resume:

KATHLEEN M. MARSAGLIA
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PROFESSIONAL PREPARATION

University of Illinois, Urbana	Geology	B.S. 1979	M.S. 1982
University of California, Los Angeles	Geology	Ph.D. 1989	

ACADEMIC/PROFESSIONAL EXPERIENCE

2000-present	Assistant Professor	California State University, Northridge
1998 to 2000	Senior Reservoir Geologist	Westport Technology International, Houston
1997-1998	Visiting Scientist	Scripps Institution of Oceanography, UC San Diego
1997	Visiting Scholar	Stanford University
1989 to 1996	Assistant Professor	University of Texas at El Paso
1982 to 1984	Exploration Geologist	Amoco Production Company, Houston

Teach Physical Geology, Sedimentation and Tectonics, Sandstone Petrology, Depositional Environments

Thesis advisor for six M.S. and two B.S. students

OTHER PROFESSIONAL EXPERIENCE
Associate Editor Journal of Sedimentary Research (2000 to present)
Shipboard scientist on five Ocean Drilling Program Leg 198, Shatsky Rise, Leg 161 (Western Mediterranean), Leg 149 (Iberian Abyssal Plain), Leg 141 (Chile Triple Junction;), Leg 126 (Izu-Bonin Arc)

PROFESSIONAL SOCIETY MEMBERSHIPS
AAPG, AGU, GSA, IAS, Geological Society of New Zealand, SEPM, Sigma Xi

CURRENT FUNDED GRANTS
2001-2004 National Science Foundation, Title: Mentoring through research: Catalyst for success in the Geosciences, ($967,210). (PI)
2002-2003 National Science Foundation MRI, Title: Acquisition of a Scanning-Electron Microscope for multidisciplinary Research in Physical Sciences at CSUN ($247,897) (co-PI)
2002-2003 National Science Foundation through Joint Oceanographic Institutions, Title: Web/ CD Atlas of ODP Core photographs ($31,810) (PI)
2002-2003 National Science Foundation through Joint Oceanographic Institutions, Title: Petrological, geochemical, and sedimentological studies of late Cenozoic

ash and Cretaceous sedimentary rocks recovered on the Shatsky Rise during ODP Leg 198 ($18,776) (PI)
2002-2003 University Faculty Research Competition Grant (CSUN) A sand provenance study designed to sleuth the sediment source(s) of the Bounty Submarine fan, $5,000. (PI)
2002-2003 College of Science and Mathematics (CSUN), Title: Student support for studies of chert and volcanic ash from the Shatsky Rise, $4,185. (PI)

SELECTED PUBLICATIONS

Marsaglia, K.M., Fukusawa, H., Cornell, W.C., Skilbeck, C.G., Meyers, P.A., Prasad, M., and Klaus, A., in review, Eustatic signals in deep-marine sedimentary sequences recovered at ODP Site 978, Alboran Basin, western Mediterranean Sea (submitted to Journal of Sedimentary Research)
Critelli, S., Arribas, J., La Pera, E., Tortosa, A., Marsaglia, K.M., and Latter, K.K., 2003, The recycled orogenic provenance sand suite from an uplifted thrust-belt, Betic cordillera, southern Spain and the Alboran Basin: Journal of Sedimentary Research (in press).
Critelli, S., Marsaglia, K.M., and Busby, C.J.,2002, Tectonic history of a Jurassic backarc-basin sequence (the Gran Canon formation, Cedros Island, Mexico), based on compositional modes of tuffaceous deposits: GSA Bulletin, v. 114, p. 515-527.
Navarette, R.C., Dearing, H.L, Constien, V.G., Marsaglia, K.M., Seheult, J.M., and Rogers, P.E. (2000) Experiments in fluid loss and formation damage with xanthan-based fluids while drilling. IADC/SPE contribution 62732, Asia Pacific Drilling Technology Conference, 20 p.
Marsaglia, K.M., Mann, P., Hyatt, R., and Olson, H. (1999) Evaluating the influence of aseismic ridge subduction and accretion(?) on the detrital modes of forearc sandstone: An example from the Kronotsky Peninsula, Kamchatka forearc. Lithos, v. 46, p. 17-42.
Marsaglia, K.M., Latter, K., and Cline, V. (1999) Sand provenance in the Alboran and Tyrrhenian Basins. Proc. ODP, Sci. Results, v. 161, p. 37-56.
Marsaglia, K.M., Garcia y Barragán, J.C., Padilla, I., and Milliken, K.L. (1996) Evolution of the Iberian passive margin as reflected in sand provenance. Proc. ODP, Sci. Results, v. 149, p. 269-280.
Bartolini, C., and Marsaglia, K.M., 1996, Mesozoic intra-arc volcanic-sedimentary sequences (Nazas Formation) in northern Durango, Mexico: A geological traverse through parts of northwestern Mexico, Guidebook for the 1996 Field Conference, Clark, K.F. and Hoffer, J.M., eds., p. 111-118.
Marsaglia, K.M., Rimkus, K.C., and Behl, R.J. (1995) Provenance of sand deposited in the Santa Barbara Basin at ODP Site 893 during the last 155ka. Proc. ODP, Sci. Results, v. 146, p. 61-75.
Marsaglia, K.M. (1995) Chapter 8, Interarc and backarc basins, in Busby, C. and Ingersoll R.V., eds., Tectonics of Sedimentary Basins, Blackwell, p. 299-329.
Marsaglia, K.M., and Devaney, K.A. (1995) Tectonic and magmatic controls on backarc basin sedimentation: The Mariana Region re-examined: in Taylor, B., ed., Backarc Basins: Tectonics and Magmatism, Plenum, New York, p.497-520.
Marsaglia, K.M., Boggs, S., Clift, P., Seyedolali, A., and Smith, R. (1995) Sedimentation in western Pacific backarc basins: New insights from recent ODP drilling: in Taylor, B., and Natland, J., eds., Active margins and marginal basins of the western Pacific, AGU Monograph, v. 88, p. 291-314.
Marsaglia, K.M., Torrez, X., Padilla, I., and Rimkus, K. (1995) Provenance of Pleistocene and Pliocene sand and sandstone, ODP Leg 141, Chile Margin: Proc. ODP, Sci. Results, v. 141, 133-151.
Prior, D.J., Marsaglia, K.M., Rochford, E.L., Agar, S.M., and Coy, G. (1995) Textural evidence of diagenetic evolution at Site 863, Chile Triple Junction: Proc. ODP, Sci. Results, v. 141, 153-167.

Strand, K., Marsaglia, K., Forsythe, R., Kurnosov, V., and Vergara, H. (1995) Outer margin depositional systems near the Chile Margin Triple Junction: Proc. ODP, Sci. Results, v. 141, p. 379-397.
Torres, M., Marsaglia, K.M., Martin, J., and Murray, R. (1995) Fluid-rock interaction and sediment diagenesis in Western Pacific Basins: in Taylor, B., and Natland, J., eds., Active margins and marginal basins of the western Pacific, American Geophysical Union Monograph, v. 88, p. 241-258.
Underwood, M.B., Ballance, P.F., Clift, P., Hiscott, R.N., Marsaglia, K.M., Pickering, K.T., and Reid, R.P. (1995) Sedimentation in forearc basins, trenches, and collision zones of the western Pacific: A summary of results from the Ocean Drilling Program: in Taylor, B., and Natland, J., eds., Active margins and marginal basins of the western Pacific, AGU Monograph, v. 88, p. 315-353.
Pavlis, T.L., Underwood, M., Sisson, V.B., Serpa, L.F., Prior, D., Marsaglia, K.M., Lewis, S.D., and Byrne, T. (1995) The effects of triple junction interactions at convergent plate margins. Report on the results of the joint JOI/USSAC and GSA Penrose conference.
Marsaglia, K.M. (1993) Basaltic Island Sand Provenance,in Johnsson, M.J., and Basu, A., eds., Processes controlling the composition of clastic sediments: Geological Society of America Special Paper 284, p.41-65.
Marsaglia, K.M., and Ingersoll, R.V. (1992) Compositional trends in arc-related, deep-marine sand and sandstone: a reassessment of magmatic-arc provenance: GSA Bulletin, v. 104, p. 1637-1649.
Marsaglia, K.M., Ingersoll, R.V., and Packer, B.M. (1992) Tectonic evolution of the Japanese islands as reflected in modal compositions of Cenozoic forearc and backarc sand and sandstone: Tectonics, v. 11, p. 1028-1044.
Marsaglia, K.M., and Tazaki, K. (1992) Diagenetic trends in Leg 126 sandstones: Proc. ODP, Sci. Results, v. 126, p. 125-138.
Marsaglia, K.M. (1992) Petrography and provenance of volcaniclastic sands recovered from the Izu-Bonin arc, Leg 126: Proc. ODP, Sci. Results, v. 126, p. 139-154.
Marsaglia, K.M. (1991) Provenance of sands and sandstones from the Gulf of California, a rifted continental arc: in R.V. Fisher and G.A. Smith (eds.), Sedimentation in Volcanic Settings, SEPM Special Publication 45, p. 237-248.
Marsaglia, K.M., and Carozzi, A.V. (1990) Depositional environment, sand-provenance and diagenesis of the Basal Salina Formation, lower Eocene, Northwest Peru: Jour. South Amer. Earth Sci., v. 3, p. 253-267.
Marsaglia, K.M., and G.deV. Klein (1983) The paleogeography of Paleozoic and Mesozoic storm depositional systems: Journal of Geology, v. 91, p. 117-142.

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ABSTRACT

Title:

Sand Provenance Within the Waipaoa Sedimentary System: Preliminary Results

Authors:
Kathleen M. Marsaglia and Dawn James
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Abstract:
The Waipaoa Sedimentary System (WSS) is situated in a deforming forearc region where older sedimentary sequences are uplifted, weathered, eroded and recycled into younger deposits. The modern Waipaoa drainage basin is mainly developed on Tertiary forearc successions that generally consist of deep marine siliciclastic

units (sandstones and mudstones) with local carbonate shoal deposits. Outcrops of Cretaceous passive margin sedimentary units are restricted to the headwaters of the Waipaoa River. There has also been periodic input of extrabasinal volcanic ash from Taupo arc volcanic eruptions.
Our goal is to create an actualistic model of sand provenance within the WSS that can be used to interpret sand "signals" in offshore marine deposits. We have collected approximately 200 samples for petrologic analysis. These include outcrop samples from exposed Cretaceous to Pliocene sedimentary rocks and tuffs, Holocene sediments and ash, and modern stream and beach sediment. Unconsolidated samples were sieved to separate the sand fraction; at selected locations where pebble counts were performed the sand was split into very fine to coarse fractions for separate analysis. Thin sections were prepared from representative gravel clasts, source rock lithologies, and the loose sands. Thin sections were stained for recognition of potassium and calcium-bearing silicate phases. Sand detrital modes of the sands were determined by counting 400 points per thin section using an automated stage and Swift counter. Counted categories were subdivided to maximize provenance information.
As pointed out by previous workers, within the exposed Waipaoa River bed, gravel clast size decreases and the relative abundance of sand and mud increases downstream. Gravel clasts are predominantly mudstone with minor sandstone, claystone, and limestone, proportionately reflecting exposed lithologies exposed in the drainage basin. In a similar fashion, our preliminary analyses show that the sand fraction within the river is dominated by mudstone lithic fragments with minor volcanic and micritic limestone lithic components. The mudstone clasts are lithologically quite diverse, exhibiting variable ratios of silt to clay and amounts of organic matter, pyrite, and micrite. There is a distinct relationship between grain size and sand composition with the finer sand fraction relatively enriched in quartz and feldspar grains. The feldspar is mostly plagioclase. This sequestering of monomineralic components in the finer fractions may be characteristic of sediment recycled fro!
m siliciclastic sedimentary terranes (e.g., accretionary prisms).

Wish to include graphics:

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