

The following application was submitted to the MARGINS Office:

Name:

Courtney K. Harris

Category: Professor

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Statement of interest:

Coastal regions occupy a critical component of sedimentary systems on continental margins, because they link terrestrial source areas and marine sediment sinks. Transport within coastal systems includes fluvial delivery in freshwater plumes, coastal erosion, settling, resuspension by energetic waves and currents, and possibly downslope transport by gravitationally-driven fluid muds. Numerical models can help interpolate necessarily sparse field observations, and also be used to extrapolate to timescales beyond those sampled. My research experience in developing one-, two-, and three-dimensional numerical models of marine sediment transport has been directed towards linking water-column transport to seabed modifications, and have included the transport processes listed above (see Harris and Wiberg, 1997, 2001, 2002; Harris, Geyer, and Traykovski, 2002; Harris, Pullen, Signell, and Doyle, 2003 in prep.).

Having received my degree from an interdisciplinary department (University of Virginia's Environmental Science Department), I am well suited to study systems that include both oceanographic and terrestrial components. I would like to continue to pursue funding opportunities for research offshore of New Zealand, because the environment provides a unique opportunity for linking sediment delivery events to depositional products, due to the large fluvial sediment loads, and relatively small-spatial scale of the system. The workshop will furthermore provide an opportunity to strengthen collaborations with New Zealand scientists and develop a better understanding of the baseline oceanographic and geologic work that has been already conducted for the area.

Short resume:
Biographical Sketch

COURTNEY KAY HARRIS

Professional Preparation:

B.S. - 1986 University of Virginia, Applied Mathematics
M.S. - 1987 University of California, Berkeley, Operations Research
M.S. - 1994 University of Virginia, Environmental Sciences
Ph.D. - 1999 University of Virginia, Environmental Sciences
1999-2001 Postdoctoral Investigator. U.S. Geological Survey, Woods Hole,
MA.

Appointments:

2001-present Assistant Professor, School of Marine Science, Virginia
Institute of Marine Science, College of William and Mary
1999-2001 Postdoctoral Investigator. U.S. Geological Survey, Woods Hole,
MA.
1987-1990 Member of Technical Staff, Bell Communications Research, Red
Bank, NJ.

Five Most Related Publications:

Harris, C.K. and P.L. Wiberg. 2002. Across-shelf sediment transport:
interactions between suspended sediment and bed sediment. *Journal of Geophysical
Research*, 107 (C1): 10,1029/2000JC000634.
Harris, C.K. and P.L. Wiberg. 2001. A two-dimensional, time-dependent model of
suspended sediment transport and bed reworking for continental shelves.
Computers and Geosciences, 27 (6): 675-690.
Harris, C.K., B. Butman, and P. Traykovski. 2003 (in press). Winter-time
circulation and sediment transport in the Hudson Shelf Valley. Resubmitted to
Continental Shelf Research.
Harris, C.K. and P.L. Wiberg. 1997. Approaches to quantifying long-term
continental shelf sediment transport with an example from the northern
California STRESS mid-shelf site. *Continental Shelf Research*, 17(11): 1389-1418.
Harris, C.K., W.R. Geyer, and P. Traykovski. 2002. Flood layer formation on the
northern California shelf by near-bed gravitational sediment flows and
oceanographic transport. *EOS, Transactions, American Geophysical Union*, 83(4):
OS22K-02.

Other Significant Publications:

Harris, C.K., J.D. Pullen, R.P. Signell, and J.D. Doyle. 2003 (in prep).
Sources and dispersal of sediment in the Western Adriatic. Abstract submitted

to the April, 2003, joint AGU / EGS (American Geophysical Society / European Geophysical Society) meeting. Nice, France.

Harris, C.K., W.R. Geyer, and R.P. Signell. 2000. Dispersal of flood sediment by oceanographic currents and energetic waves. *EOS, Transactions American Geophysical Union*, 80: OS281.

Harris, C.K. and R.P. Signell. 1999. Circulation and sediment transport in the vicinity of the Hudson Shelf Valley. *Estuarine and Coastal Modeling; Proceedings of the Sixth International Conference*. M.L. Spaulding, H.L. Butler (eds), American Society of Civil Engineers. 380-394.

Wiberg, P.L., D.E. Drake, C.K. Harris, and M.E. Noble. 2002. Sediment transport on the Palos Verdes shelf over seasonal to decadal time scales. *Continental Shelf Research*, 22(6?7): 987-1004.

Wiberg, P.L. and C.K. Harris. 1994. Ripple geometry in wave-dominated environments. *Journal of Geophysical Research*, 99 (C1): 775-789.

Synergistic Activities:

NOPP-funded community sediment transport modeling project: the National Oceanographic Partnership Program (NOPP) has funded our effort to evaluate the steps needed towards the development of accepted research tools for modeling sediment transport in coastal areas. My contributions include developing criteria for useful research tools in this area, coordinating three special sessions at the 2002 AGU / ASLO meeting, and planning two meetings aimed at opening discussions to the general research community (one held at the 2002 AGU / ASLO meeting, one held September, 2002 in Williamsburg, Virginia).

NSF-Margins community sediment transport modeling effort: Presented an invited talk at the February, 2002 workshop in Boulder, Colorado, representing coastal sediment transport research.

Eurostrataform 2002 Annual Meeting: Presented an invited talk to the assembly, titled Dispersal of Po River Sediment in the Western Adriatic: Three-dimensional Transport Model. Meeting held in Winchester, U.K., Sept., 2002.

Margins Source-to-Sink: Participated in the 1999 Lake Quinault and 2000 Lake Tahoe workshops that helped define the Source to Sink program, and recommended focus areas.

Modeling efforts include sediment transport on wave dominated shelves (Eel River and Russian River shelves, Northern California; Palos Verdes shelf, Southern California), as well as shelves where oceanographic circulation plays a key roll (western Adriatic, New York Bight). These efforts have required 1, 2, and 3-D numerical models of sediment transported by dilute suspensions, as well as by near-bed fluid muds.

Proposed efforts have included research offshore of rivers delivering high sediment loads to the coastal ocean, including the Waipu and Waiapaoa Rivers.

Recent Collaborators: P. Alexander (USGS), B. Butman (USGS), M. B. ten Brink (USGS), D. Drake (Drake Marine Consulting), W. R. Geyer (WHOI), M. Noble (USGS), J. Pullen (NRL-Monterey), C. Sherwood (USGS), R. Signell (SACLANT-CEN), P. Traykovski (WHOI), P. Wiberg (U.Va.).

Graduate Advisor: P. Wiberg (U.Va.)
Post-Doctoral Supervisor: B. Butman (USGS)
Students Supervised: co-advising Tara Kniskern (VIMS).

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ABSTRACT

Title:

Authors:

Abstract:

Wish to include graphics:

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