Alexander K. Fremier

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EDUCATION

University of California at Davis, Davis, CA. *March 2007*. **Ph.D.** Ecology "Restoration of Floodplain Landscapes: Analysis of Physical Process and Vegetation Dynamics in the Central Valley of California"

University of California at Davis, Davis, CA. *June 2003*. **M.A.** Geography "Floodplain age modeling techniques to analyze channel migration and vegetation patch dynamics on the Sacramento River, CA."

Principia College, Elsah, IL. *June 1996*. **B.S.** Environmental Science *and* Mathematics *With Honors*

PUBLICATIONS

Articles

2012

Viers, J.H., A.K. Fremier, R.A. Hutchinson, J.H. Thorne, J.A. Quinn, and M.G. Vaghti. 2012. Patterns of regional and local riparian plant diversity in the California Sacramento - San Joaquin Valley. Restoration Ecology. 10.1111/j.1526-100X.2011.00787.x

Fremier, A.K., J.C. Stella, S. Dufour, and H. Piégay. *Accepted*. Special Issue: Abandoned river channels: physical-ecological linkages, habitat dynamics, and implications for river corridor management. River Research and Application.

2011

Fremier, A.K. and K.M. Strickler. 2011. Topics in River Structure and Function. BioScience. Introduction to paper compilation.

Harper, E.B*., J.C. Stella, and A.K. Fremier. *2011*. Using ecologically meaningful sensitivity analyses to quantify complex model uncertainty: A case study of Fremont cottonwood (*Populus fremontii*) population dynamics. Ecological Applications 21:1225-1240.

Smith, M. E., T. W. Henkel, M. Catherine Aime, A. K. Fremier, and R. Vilgalys. 2011. Ectomycorrhizal fungal diversity and community structure on three co-occurring leguminous canopy tree species in a Neotropical rainforest. New Phytologist **192**:699-712.

Stella, J.C., M.K. Hayden, J.J. Battles, H. Piégay, S. Dufour, A.K. Fremier. 2011. The critical role of abandoned channels in sustaining pioneer riparian forest ecosystems. Ecosystems 14:776-790

2010

Fremier, A.K., J.I. Seo, and F. Nakamura. 2010. Downstream connectivity and fluvial export of large wood: dynamic patterns and processes in the river corridor. Geomorphology 117:33-43.

Savage, W.K., A.K. Fremier, and H.B. Shaffer. 2010. Within-population processes override the signal of a landscape influence on genetic structure of the southern long-toed salamander. Molecular Ecology. **19**:3301-3314

2009

Fremier, A. K., and T. S. Talley. 2009. Scaling riparian conservation efforts with river hydrology: lessons from blue elderberry distributions along four central California rivers. Wetlands 29:150-162.

Smith, M. E., G. W. Douhan, A. K. Fremier, and D. M. Rizzo. 2009. Are true multihost fungi the exception or the rule? Dominant ectomycorrhizal fungi *Pinus sabiniana* differ from those on co-occurring *Quercus* species. New Phytologist. 128:295-299

Vaghti, M.G., M. Holyoak, A. Williams, T.S. Talley, A.K. Fremier, and S.E. Greco. 2009. Understanding the ecology of blue elderberry to inform landscape restoration in semi-arid river corridors. Environmental Management 43: 28-43.

2007

Dixon, M.D., J.C. Stromberg, J.T. Price, H. Galbraith, A.K. Fremier, and E.W. Larsen. 2007. Potential Effects of Climate Change on the Upper San Pedro Riparian Ecosystem: Boon or Bane? (Chapter 3). *in* J. Stromberg and B. Tellman, editors. Riparian Area Conservation in a Semi-Arid Region: The San Pedro River Example.

Greco, S.E., A.K. Fremier, R.E. Plant, and E.W. Larsen. 2007. A method to track surficial patterns of floodplain chronology on a large meandering river: Analysis of land production rates and riparian vegetation distribution over land age gradients. Landscape and Urban Planning 81:354-373.

Larsen, E.W., E.H. Girvetz, and A.K. Fremier. 2007. Landscape level planning in alluvial riparian floodplain ecosystems: using geomorphic modeling to avoid conflicts between human infrastructure and habitat conservation. Landscape and Urban Planning 79:338-346.

2006

Larsen, E. W., A. K. Fremier, and E. H. Girvetz. 2006. Modeling the effects of variable annual flow on river channel meander migration patterns, Sacramento River, California, USA. Journal of the American Water Resources Association 42:1063-1075.

Larsen, E. W., A. K. Fremier, and S. E. Greco. 2006. Cumulative effective stream power and bank erosion on the Sacramento River, California, USA. Journal of the American Water Resources Association 42:1077-1097.

Larsen, E.W., E.H. Girvetz, and A.K. Fremier. 2006. Assessing the effects of alternative setback channel constraint scenarios employing a river meander migration model. Environmental Management 37:880-897.

*Student or post-doc work

PROFESSIONAL EXPERIENCE

Assistant Professor, University of Idaho, Moscow Idaho USA (2008- present)

- Tenure track research appointment with 45% researching and 45% teaching

Technical Advisory Group Member, *Depart. of Water Resources,* Sacramento, CA. (2003 - 2004)

- Modeled channel migration and vegetation establishment patterns under proposed alternative-flow scenarios (North of Delta Off-Stream Storage Investigation)

Ecologist, *US Forest Service Enterprise Team*, Nevada City, CA (Summer 2001)

- Set up permanent plots in meadow, riparian and grassland ecosystems as part of a long-term range impact assessment study including plant species identification

Software Engineer, *OSI Software, Inc*, San Leandro, CA (1999 - 2000)

- Coded and documented performance management software

Peace Corps Volunteer, Kathmandu, Nepal (1997 - 1999)

- Design and implemented a forest resource inventory for Langtang National Park after receiving funding from USAID, The Mountain Institute and the Nepali government
- Conducted with Nepali park staff village meetings to examine forest use practices and environmental perceptions

RESEARCH EXPERIENCE

Post-Doctoral Research, *Hokkaido University,* Sapporo, Japan with Dr. Futoshi Nakamura
(2007 – 2008)

- Secured a one-year post-doctoral fellowship and research grant through the Japan Society for the Promotion of Science (JSPS)
- Analysis of field and watershed data on large woody debris to understand patterns and processes of wood recruitment, transport, storage and export in multiple nested watersheds

Graduate Researcher, *University of California, Davis* with Dr. E.W. Larsen and Dr. S.E. Greco
(June 2003 – March 2007)

- Advanced a meander migration model by linking it with a geographic information system (GIS) to model and quantify spatial patterns of channel morphology and vegetation dynamics
- Incorporated a variable flow component and heterogeneous erosion field into the meander migration model to test applied and basic research questions
- Analyzed historic riparian vegetation patterns using repeat aerial photography
- Researched plant species composition over a chronosequence using GIS methods

Contract Researcher, *University of California, Davis,* Various projects (2003-2006)

- *Rare species modeling*: helped create a set of GIS-based statistical models of six rare plant species for the US Forest Service with Prof. Mark Schwartz, Environmental Science & Policy, UC Davis
- *Agricultural data*: analyzed spatial data of pistachio orchard yields using GIS to identify trends and improve management procedures with Prof. Patrick Brown, Pomology, UC Davis

CLASSES

Riparian Ecology and Management (3 units). Upper division undergraduate course. Every spring semester
Stream Ecology (3). Graduate course. Odd years, fall semester.
Community Ecology (3). Graduate course. Even years, fall semester.
Resilience in Changing Landscapes (1). Graduate seminar. One time IGERT seminar.
Current Topics in Ecology (1). Graduate seminar. Each semester, variable topics.

SCHOLARSHIP

Conferences Papers Presented

2011

Fremier, A.K., G.F.S. Boisrame, J.H. Viers, E.P Maurer and E.H. Girvetz. 2011. How Will the Hydrograph Change In Predicted Future Climates? A Detailed Comparative Analysis of Macro-Scale Hydrological and Climate Model Output From the California Sierra Nevada. American Fisheries Society Annual Meeting. Seattle, WA. Presentation.

Fremier, A.K. N. Estrada Carmona*, E. Harper, F. DeClerck. Using global sensitivity analysis to understand higher order interactions in complex models: an application of GSA on the Revised Universal Soil Loss Equation (RUSLE) to quantify model sensitivity and implications for ecosystem services management in Costa Rica. American Geophysical Union, Annual Meeting, San Francisco, CA

Niemeyer, R.J.*, A.K. Fremier, R. Heinse, F.A. DeClerck, W. Chávez Huamán. 2011. Vegetation as a mechanism for increased vadose zone infiltration in the Pacific Lowlands of Nicaragua. American Geophysical Union, Annual Meeting, San Francisco, CA.

2010

Gomez, C.A., H. Piégay and A.K. Fremier. 2010. Floodplain polygenesis: from geomorphic construction to forest pattern. American Geophysical Union. Poster

Jensen, J.* and A.K. Fremier. 2010. Use of aerial photography and airborne lidar to delineate river channel meander and cutoff dynamics. American Society for Photogrametry and Remote Sensing

Harper, E.H.*, J.C. Stella, and A.K. Fremier. 2010. Multiscale validation of a spatially explicit demographic model of Fremont cottonwood on the Sacramento River. CALFED Science Conference.

Viers, J. H., A. K. Fremier, and R. A. Hutchinson. 2010. Predicting map error by modeling the Sacramento River Floodplain. *in* 30th Annual ESRI International User Conference Proceedings, San Diego, CA.

2009

Fremier, A.K. 2009. Assessing the effects of alternative setback channel constraint scenarios employing a river meander migration model. American Fisheries Society - Idaho Chapter, Boise

Fremier, A.K., Dufour, S., Stella, J.C. and H Peigay. 2009. Abandoned river channels: physical-ecological linkages, habitat dynamics, and implications for river corridor management. Ecological Society of America, Leader of Special Organized Session at the Ecological Society of America Annual meeting. Albuquerque, NM. Session Chair

Fremier, A.K., S. Gmur, and J.M. Scott. 2009. The River Network Tool: Connecting protected areas through the river network. Idaho EPSCoR Annual Meeting, Moscow, ID. Poster

Fremier, A.K. and W.K. Savage. 2009. A cost corridor approach for identifying effective dispersal routes in heterogeneous landscapes. Fremier and Savage. International Association for Landscape Ecology - US Chapter. Annual Meeting, Snowbird, Utah.

Lightbody, A., E. Yager, A. Fremier. 2009. The geomorphic signature of life: effect of riparian vegetation on bedload transport and sediment accretion. *Binghamton* Geomorphology Symposium. Presentation.

Harper. E.B.*, J.C. Stella, A.K. Fremier. 2009. Ecologically meaningful sensitivity analyses: A case study of Fremont cottonwood. Idaho EPSCoR Annual Meeting, Moscow, ID. Poster

Harper. E.B.*, J.C. Stella, A.K. Fremier. 2009. Ecologically meaningful sensitivity analyses: A case study of Fremont cottonwood (*Populus fremontii*). Annual Meeting of the Ecological Society of America, Albuquerque, NM.

Stella, J.C., E.B. Harper, A.K. Fremier, M.K. Hayden, J.J. Battles. 2009. Using a patch dynamics approach to model cottonwood forest populations in river floodplains Oral presentation at the Annual Meeting of the Ecological Society of America, Albuquerque, NM.

<u>American Geophysical Union, Annual Meeting, 2009 (Presentation unless noted)</u>

Fremier, A.K, G.F.S Boisrame, J.H. Viers, E.H. Girvetz, E. Maurer. How will the hydrograph change in predicted future climates? A detailed hydrological analysis of macro-hydrology and climate model outputs. Poster

Pierce, J.L., C. Baxter, E. M. Yager, A. K. Fremier, B. T. Crosby, A. M. Smith, B. Kennedy, J.A. Hicke, K. Feris. Forests, fire, floods and fish: nonlinear biophysical responses to changing climate. Poster

Yager, E. M., A. Lightbody, and A. K. Fremier. The geomorphic signature of life: effects of riparian vegetation on bedload transport and sediment accretion. American Geophysical Union.

Harper, E.B.*, J. C. Stella, and A. K. Fremier. Identifying data gaps and prioritizing restoration strategies for Fremont cottonwood using linked geomorphic and population models. Poster

Stella, J. C., E. B. Harper, A. K. Fremier, M. K. Hayden, and J. J. Battles. Quantifying geomorphic controls on riparian forest dynamics using a linked physical-biological model: implications for river corridor conservation.

2008

Fremier, A.K., J. H. Viers, J.C. Stella. 2008. Floodplain heterogeneity drives riparian vegetation composition and structure through channel meander migration and channel abandonment. American Geophysical Union, Abstract H33B-1007

Stella, J.C., M.K. Hayden, J.J. Battles, H. Piégay, S. Dufour, and A.K. Fremier. 2008. A conceptual model of riparian forest response to channel abandonment on meandering rivers. American Geophysical Union, Abstract H31H-07