

Curriculum Vitae

Laura L. Keefer, PH

Illinois State Hydrologist
Watershed Science Section, Head
Fluvial Geomorphologist
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Education: M.S., Geography, University of Illinois at Urbana-Champaign. Thesis Title: *Multi-Scale Geomorphic Assessment Approach for Streams in the Southern Illinois Region: Case Study, Big Creek Watershed, Pulaski and Union Counties, Illinois.*

B.S., Geology, University of Illinois at Urbana-Champaign.

Professional Certifications

Certified Professional Hydrologist – American Institute of Hydrology

Experience:

Illinois State Water Survey

June 2018 – present: Illinois State Hydrologist

Designated by State of Illinois Statute, the Illinois State Hydrologist serves as the authoritative spokesperson providing current information on research and scientific inquiries to the public at large, other scientists, industry, and governmental agencies. Particularly coordinate and provide science-based information on watersheds, rivers, groundwater, and other state water resources by coordinating appropriate ISWS and Prairie Research Institute staff on statewide water issues.

January 2014 to present: Head, Watershed Science Section (Senior Hydrologist)

Manage the Watershed Science Section including programmatic and financial planning, supervise and mentor staff, identify research needs, lead section growth and staff development, highlight Section activities and contribute to the needs of the Illinois public, state agencies, research and funding organizations and other duties as required for these activities.

Conduct watershed-scale studies on hydrology, sediment, and nutrient transport in Illinois watersheds: Sangamon River (Lake Decatur), Cache River, Vermilion River (Illinois and Wabash River Basins), Spoon River, Embarras River, Kaskaskia River, and Lake Springfield (Sangamon River). Currently investigator for studies in the Kaskaskia River, Upper Sangamon River, and Cache River watersheds. Also, senior investigator NSF Intensively Managed Landscapes-Critical Zone Observatory. Collaborator on several University of Illinois led research initiatives.

Current research focus is fluvial geomorphology as related to erosion and sedimentation processes. Developed a multi-scale geomorphic assessment protocol to evaluate stream channel stability for use in Illinois watersheds. Collaborates with Prairie Research Institute, University of Illinois, and state and federal agency scientists across disciplines to investigate the spatial, temporal, and physical context of channel adjustment responses.

Directs the ISWS Benchmark Sediment Monitoring Program (BSMP) conducting investigations into long-term trends in sediment transport, estimate sediment loads in unmeasured watersheds, and target and evaluate long-term effectiveness of watershed BMPs. Manage the Joint Illinois State Water Survey/Illinois State Geological Survey (ISWS/ISGS) Sediment Materials Laboratory in Champaign.

July 2008 – December 2013: Fluvial Geomorphologist/Hydrologist

September 2002 – June 2008: Hydrologist

August 1994 – August 2002: Associate Hydrologist

February 1992 – July 1994: Assistant Hydrologist

July 1990 – January 1992: Associate Supportive Scientist

August 1988 – June 1990: Assistant Supportive Scientist

August 1986 – July 1988: Junior Supportive Scientist

February 1986 – July 1986: Research Assistant

United States Geological Survey, 1984 to 1986: Hydrologic Aide

Participated in the study of the unsaturated zone in the low-level radioactive waste-disposal site in Sheffield, Illinois. Experience included data retrieval from Campbell Scientific data recorders and processing the data for further analyses. Also participated in a water quality study of Cedar Creek near Galesburg, Illinois -- collected water quality samples and environmental data along at stream affected by waste water treatment effluent. Assisted in a statistical survey on the type and quantity of vegetation on the trench caps of a low-level radioactive waste site in Sheffield, Illinois using SAS. Assisted in the writing and editing of various USGS reports.

Professional Training:

- *Understanding Nutrient Issues Affecting Ohio's Inland Lakes* – U.S. Environmental Protection Agency, Watershed Academy Webcasts, November 30, 2016 (2 contact hours). Instructors: Rick Wilson, Ohio EPA; Shannon Brattebo, Tetra Tech; Harry Gibbons, Tetra Tech.
- *Structured Decision Making Workshop* – U.S. Fish & Wildlife Service/U.S. Geological Survey, Dept. of the Interior, May 2-6, 2016, Naperville, Illinois, 36 instructional hrs. Instructors: Patricia Heglund, U.S. Fish & Wildlife Service, Midwest Region.
- *Principles of Streambank Analysis & Stabilization* -- River Restoration Professional Certificate Program, Portland State University, Portland, Oregon, October 16-18, 2007, 2.4 CEU. Instructors: Andrew Simon-USDA-ARS National Sedimentation Lab; Colin Thorne-University of Nottingham, UK; Janine Castro-U.S. Fish & Wildlife Service, Portland, OR.
- *How to Use the Hydrologic Engineering Center's River Analysis-System (HEC-RAS) Computer Workshop* -- American Society of Civil Engineers workshop, St. Louis, MO, September 19-21, 2007, 2.4 CEU. Instructors: Martin J. Teal, Raymond Walton, Christopher R. Goodell - WEST Consultants.
- *2nd National Sediment Laboratory Workshop* – U.S. Geological Survey, Office of Surface Water & Office of Water Quality-Branch of Water Quality Systems, March 2-3, 2004, 16 contact hours. Instructors: John R. Gray, Clyde Sholar, Dan Gooding, Natalie Latysh, Greg Koltun, Kent Dodge, Sandy Williamson, Bill Johnson.

- *Sediment Data Collection Techniques* -- USGS Short Course, Vancouver/Castle Rock, Washington, March 23-28, 2003, 40 contact hours. Instructors: T.K. Edwards, L. Freeman, D.J. Gooding, J.R. Gray (and Coordinator), T.W. Hale, L. Keefer, K.R. Spicer, M. Uhrich-U.S.G.S., L. Keefer invited by course coordinator to make a presentation on sediment lab QA protocols to attendees as well as participate in the short course.
- *Geomorphic Analysis of Fluvial Systems* -- USGS Short Course, USGS National Training Center, Denver, CO, December 2-6, 2002, 4.0 CEU. Instructors: Cliff Hupp, USGS; Waite Osterkamp, USGS; Andrew Simon, ARS-National Sedimentation Lab; Faith Fitzpatrick, USGS.
- ARC/GIS 8 Training -- October 17 & 24, 2002. Instructor: Kingsley M. Allan, Illinois State Water Survey, University of Illinois instructor.
- *Wetlands and the Law: A Practical Guide* -- Professional Seminar at the Morton Arboretum, Lisle, IL, September 10, 1993.

Professional Memberships:

- Member**, American Geophysical Union (AGU), 2001-2020
Member, American Society of Civil Engineers (ASCE), Aff.M. ASCE, 2006-2020
and Environmental & Water Resources Institute (EWRI), 2006-2020
Member, American Water Resources Association (AWRA), Professional, 1998-2020
Member, Geological Society of America (GSA) and Quaternary Geology & Geomorphology Division, Professional, 2002-2020

Professional Activities:

- UIUC Water Council Member**, since 2015, Re-invited to serve on Council for term January 2019-August 2020. Institute for Sustainability, Energy, and Environment, Urbana, IL [<http://sustainability.illinois.edu/water-at-illinois/>].
- Science Advisory Committee Member**, 2015-present, Great Lakes to Gulf (GLTGSM) – Virtual Observatory, National Great Rivers Research & Education Center, East Alton, IL.
- Science Advisory Committee Member**, 2013-present, Great Rivers Ecological Observation Network (GREONSM), National Great Rivers Research & Education Center, East Alton, IL.
- Advisory Board Member**, 2016-2018, Illinois Water Resources Center, University of Illinois, Champaign, IL.
- Co-Chair of Conference Planning Committee** for 2013 and 2015 Biennial Governor's Conference on the Management of the Illinois River, Peoria, IL.
- Conference Planning Committee and Co-Captain Session Subcommittee**, Governor's Conference on the Management of the Illinois River (2001, 2003, 2005, 2007, 2009, 2011, 2013, 2015).
- Conference Planning Committee**, 2012, 2014, 2016 Biennial ILLINOIS WATER Conference, Urbana-Champaign, Illinois. Student Poster Contest Coordinator.
- Secretary, American Water Resources Association, Illinois Section (ILWRA)** (2010-2014)
- Secretary/Treasurer**, American Water Resources Association, Illinois Section (2002-2006; 2006-2010).
- Session Co-Convener**, American Geophysical Union Fall Meeting, December 15-19, 2008, San Francisco, CA. Sessions (H42A, H43B, H41I) Hydrogeomorphic and Biological Responses to Human Impacts and Mitigation Measures on Alluvial Channels.

Invited member to give state perspective and technical insights of *Upper Mississippi River System Hydrogeomorphic Conceptual Model Workshop*. LaCrosse, WI, November 13-15, 2018.

Member, National Water Information Coordination Program, Advisory Committee on Water Information, Subcommittee on Sedimentation (<http://acwi.gov/sos/>) Nominated and invited to participate in the *1st National Stream Morphology Database Exchange (NSMDE) Workshop*, Madison, WI on April 27-28, 2011. A subcommittee of NSMDE workshop participants have been meeting since 2011 and submitting proposals to fund a pilot study for an exchange.

Reviewer, Journal of the American Water Resources Association (JAWRA).

Member, Environmental & Water Resources Institute of ASCE, Hydraulics and Waterways Council, Sedimentation Committee and River Restoration Committee

Conference Program Chair, 13th Annual Conference of the Illinois Lake Management Association (ILMA). Rockford, IL, April 30-May 2, 1998.

Board of Directors, Illinois Lake Management Association (1996-1998).

Calendar Editor for International Meetings, *Water International*, Journal of International Water Resources Association (1994-1998).

Co-organizer, *Annual Meeting of the Illinois Geographical Society*, Champaign (4/22-23/94). Organized and conducted a 1/2-day tour to the Decatur Water Treatment Facility. Also organized and presented a workshop on surface water resources facts, and figures in Illinois to meeting participants.

Honors and Awards:

Plaque to the Illinois State Water Survey from the Union County Soil & Water Conservation District, Anna, Illinois. Appreciation of cooperation and assistance in the Big Creek Watershed Pilot Project; February 2, 2006 in recognition of the following Illinois State Water Survey staff: Mike Demissie, Laura Keefer, Rich Allgire, Vern Knapp, and John Beardsley.

Research Initiatives/Collaborations:

- **National Science Foundation – National Critical Zone Observatories (2013-2020)** NSF awarded a multi-institutional grant led by the University of Illinois with collaborations of nearly two dozen researchers from University of Iowa, Northwestern University, University of Minnesota, Purdue University and, Penn State. Along with Laura's participation as investigator from the Illinois State Water Survey, other researchers from the Illinois State Geological Survey collaborate as well. The Critical Zone Observatory Program recognizes that too little is known about how physical, chemical, and biological processes in the Critical Zone are coupled and at what spatial and temporal scales. Many of these processes are highly nonlinear and can range across scales from atomic to global, and from seconds to eons. Understanding the complex web of physical, chemical, and biological processes of the Critical Zone requires a systems approach across a broad array of sciences: hydrology, geology, soil science, biology, ecology, geochemistry, geomorphology, and more. This current collaboration intends to focus on the upper Midwest identified as an intensively managed landscape (IML) and will conduct investigations in activities centers across process systems in landscapes from Iowa, Minnesota and Illinois. *Laura is the site coordinator* for the Upper Sangamon River watershed and co-researcher in the Water, Soil, Sediment Landscape Connectivity theme.

- **IACAT (2007- 2012)** Institute for Advanced Computing Applications and Technologies in the University of Illinois at Urbana-Champaign. Institute focuses on developing cyberinfrastructure to transfer advances from computer science and engineering research to the larger scientific, engineering, and arts, humanities and social science communities to speed progress across disciplines. Collaborate with University of Illinois researchers across several departments on a project, *Virtual Observatory for Sustainability of Intensively Managed Environmental Systems*, funded by IACAT. Collaborated with University researchers in developing a prototype virtual environmental observatory and serve as task lead for sensor network development.
- **WATERS: Upper Illinois test bed site (2008 – 2010)** WATERS Network was a joint collaboration among the environmental engineering and science, hydrologic and related earth science, and social science research communities and funded by the National Science Foundation (NSF) Engineering and Geosciences Directorates. The vision for the Network was to construct a national-scale network of observational and experimental facilities, using NSF Major Research Equipment and Facilities Construction funding (MREFC), for systematic water measurements, data storage and duration, modeling and visualization that will enable science and engineering research that is not currently possible. ISWS, Center for Watershed Science contributed to a conceptual network design for the Upper Illinois River Basin (one of five testbeds) needed for the Conceptual Design Review.
- **CUAHSI Hydrologic Observatory (2004-2006)** Consortium of Universities for the Advancement of Hydrologic Science (NSF). Collaborated with University of Illinois researchers, Dr. Praveen Kumar – Principal Organizer, on the development of a hydrologic observatory in the Illinois River Basin. The observatory development was focused on integrating activities among the various environmental disciplines interested in water-oriented observatories. Laura collaborated with researchers from several universities in the Upper Midwest. Tangible result of CUAHSI's development was a Major Research Equipment and Facilities Construction (MREFC) initiative with the Environmental Engineering community was the **WATER and Engineering Research System** network (**WATERS** network) with awards for WATERS test bed sites (mentioned above).
- **NSF proposal collaborations (unfunded):**
 - National Science Foundation (NSF) and U.S. Dept. of Agriculture (USDA) & National Institute of Food and Agriculture (NIFA) Program Solicitation, Innovations at the Nexus of Food, Energy and Water Systems (INFEWS). Joint proposal between several PRI and UIUC Faculty. UIUC-Agriculture Engineering Department, R. Cooke (lead-PI), co-PI's: E. Getahun, L. Keefer (2016).
 - Major Research Initiative Program – Recovery & Reinvestment Submission. *Development of a Watershed-scale Instrument for Integrated Water and Nutrient Cycle Science and Engineering Research and Education*. Joint proposal with University of Illinois researchers. ISWS lead department and won UIUC limited submission call. M. Demissie, lead-PI, L. Keefer – Senior Investigator. (2011)
 - Water Sustainability and Climate Program-Category 2: *Sustainable Intensively Managed Mixed-Use Catchments: Distributed Sensing & Stochastic Modeling for Adaptive Management*. L. Keefer – Senior Investigator. (2011)
 - Science and Technology Center Program: GeoSpatial Synthesis center for Sustainability And Resilience (GeoS³TAR). L. Keefer – Team Leader. (2011)
 - Water Sustainability and Climate Program-Category 2: *A New Paradigm for Understanding and Predicting Multi-scale Climate, Water, and Biogeochemical Systems and Their Interconnections with Humans in Agroecosystems*. L. Keefer – Senior Investigator. (2010)

Public Service on Technical Committees [local, state, federal] (34):

- *Boneyard Creek Plan Steering Committee*, Member, City of Urbana, 2018.
- U.S. Army Corps of Engineers, *Sangamon River Conceptual Modeling Workshop*, Beardstown, IL, July 2015.
- *Illinois Nutrient Loss Reduction Strategy – Nutrient Monitoring Council*, Illinois Environmental Protection Agency, Member 2015-present.
- *Illinois State Water Plan Task Force*, comprised of state agency representatives and invited federal and local partners to discuss water planning in Illinois, 2014-present.
- U.S. Geological Survey – *Illinois Streamgauge Cooperators Annual Meeting*, ISWS representative, 2011 – present.
- Cache River Wetlands Joint Venture Partnership, *Cache Science Workshop*, Carbondale, IL, November 9, 2011.
- *Heart of the Sangamon Ecosystem Partnership*, Member and Technical Advisor, 2011-present.
- *Illinois Stream Impact/Mitigation Assessment Method Development Team*, U.S. Army Corps of Engineers. Partnering with Illinois State Geological Survey. Member since 2008-2014.
- *Illinois River Coordinating Council – State Issues Working Group*. Member 2003-2004.
- *C-FAR Natural Resources Working Group*, ISWS Representative 1998-2000.
- *C-FAR, Water Quality Strategic Research Initiative*, ISWS Representative, 2000-2005.
- *Interagency Pilot Watershed Focus Group*, Watershed Management Committee (WMC), Natural Resources Conservation Committee (NRCC), Member and ISWS Representative since May 1997.
- *Practical Farm at Robert Allerton Park Partnership*. Member 1998-1999.
- *Illinois State Scientific Surveys Joint Strategic Plan Team*. Champaign, IL. 1997-1998.
- *Illinois Environmental Protection Agency's (IEPA) Source Water Protection Technical and Citizens Advisory Committee*, required by Section 1428 of the 1996 Safe Drinking Water Act. Member 1997.
- *Integrated Management Plan for the Illinois River Watershed, Illinois River Strategy Team, Agricultural Practices Action Team*. 1997.
- *CFAR II Visioning Retreat Technical Committee*. March 11-13, 1997, Allerton House, Monticello, IL.
- *Lake Springfield Watershed Resource Planning Committee*, Member and scientific/technical advisor since January 1996.
- *Interagency Water Quality Focus Group, Illinois Natural Resources Coordinating Council, Watershed Management Committee*. Member 1995-1998.
- *Embarras River Management Association (ERMA)*, Technical Advisory Committee. Member 1995-1996.
- *Champaign County Soil Water Conservation District Advisory Board*, Water Quality Subcommittee. Invited by SCS to replace Dr. Ming T. Lee as a member of the committee, Member 1994-1996.

- *Management Systems Evaluation Areas (MSEA) Program (6/9-10/93)*. ISWS representative to this Midwest regional workshop.
- *Vermilion River Watershed Protection Council (11/1/93)*. Appointed scientific advisor to council.
- *Upper Sangamon River Watershed Planning Committee (Technical Advisor)*, Member and Technical Advisor since 1991.
- *IEPA-Watershed Restoration Action Strategy Technical Advisory Committee Member*:
 - Little Vermilion River, LaSalle Co., IL
 - Upper Macoupin Creek, Macoupin Co., IL
- *NRCS/SWCD Resource Planning Technical Advisory Committee Member*:
 - Cache River, Union & Pulaski Counties, IL
 - Big/Long Creek, Macon Co., IL
 - Big Muddy Watershed, Illinois Counties: Washington, Jefferson, Perry, Franklin, Jackson, Williamson, and Union.
 - Carlyle Lake Watershed, Fayette Co., IL
 - Horse/Brush Creek, Sangamon Co., IL
 - Macon Co. SWCD Resource Planning Committee
 - Upper Cache River Watershed Planning Technical Committee
 - Peoria Lake Conservation Planning Technical Committee

Publications:

Technical Reports (49)

- Getahun, E., L.L. Keefer, D.W. Crowder, M. Demissie, S. Chandrasekaran, R.L. Allgire. 2019. *Benchmark Sediment Monitoring Program for Illinois Streams: Analysis of 36 Years of Sediment Data (Water Years 1981-2016)*. ISWS Report of Investigations 124, Illinois State Water Survey, Champaign, IL.
- Getahun, E., L. Keefer, S. Chandrasekaran, and A. Zavelle, 2019. *Water quality Trend Analysis for the Fox River Watershed: Stratton Dam to the Illinois River*. ISWS Contract Report 2019-04, Illinois State Water Survey, Champaign, IL, 55p. and CD Appendix. <http://hdl.handle.net/2142/103009>
- Esarey, D., N. Holm, L. Keefer, E. Meschewski, A. Phillips, J. Stein, and R. Winkel. 2017. *Assessing Progress on the 1997 Integrated Management Plan for the Illinois River*, Prairie Research Institute-Response Team reply to request by Illinois. Lt. Governor E. Sanguinetti. Letter of transmittal, Report (25p.), and Appendices (143p.). University of Illinois IDEALS document-<https://www.ideals.illinois.edu/handle/2142/99065>.
- Knapp, V., J. Angel, J. Atkins, L. Bard, E. Getahun, K. Hlinka, L. Keefer, W. Kelly, and G. Roadcap, 2017. *The 2012 Drought in Illinois*. ISWS Report of Investigation RI-123, Illinois State Water Survey, Champaign, IL, 99p. <http://hdl.handle.net/2142/96286>
- Demissie, M., E. Getahun (Bekele) and L. L. Keefer, 2016. *The Sediment Budget of the Illinois River: 1981-2015*. ISWS Report of Investigation RI-122, Illinois State Water Survey, Champaign, IL, 58 p. with Appendices. DOI: 10.13140/RG.2.2.13793.30569. <http://hdl.handle.net/2142/98499>

- Bekele, E.G., L. Keefer, and S. Chandrasekaran. 2014. *Decision Support Model for Generating Optimal Alternative Scenarios of Watershed Best Management Practices*. ISWS CR 2014-02; Illinois State Water Survey, Champaign, IL, 104 p. <http://hdl.handle.net/2142/50045>
- Keefer L. L. and E. Bauer. 2011. *Upper Sangamon River Watershed Monitoring Data for the USEPA Targeted Watershed Study: 2005-2008*. Illinois State Water Survey Contract Report 2011-03. <http://hdl.handle.net/2142/39554>
- Keefer L. L., E. Bauer and M. Markus. 2010. *Hydrologic and Nutrient Monitoring of the Lake Decatur Watershed: Final Report 1993-2008*. Illinois State Water Survey Contract Report 2010-07. <http://hdl.handle.net/2142/18675>
- Demissie, M., E. Bekele, Y. Lian, F. Yue, and L. Keefer. 2010. *Hydrologic and Hydraulic Modeling for Evaluating Alternatives for Managed Connection of the Upper and Lower Cache Rivers*. Illinois State Water Survey Contract Report 2010-06. <http://hdl.handle.net/2142/18674>
- Keefer L. L. and E. Bauer. 2008. *Watershed Monitoring for the Lake Decatur Watershed, 2003-2006*. Illinois State Water Survey Contract Report 2008-04. <http://hdl.handle.net/2142/8870>
- Demissie, M., L. Keefer, Y. Lian, F. Yue, and B. Larson. 2008. *Hydrologic and Hydraulic Modeling and Analyses for the Cache River for the Purpose of Evaluating Current Conditions and Alternative Restoration Measures*. Illinois State Water Survey Contract Report 2008-01. <http://hdl.handle.net/2142/8873>
- Keefer, L.L. 2006. *Hydrology, Nutrient, and Sediment Monitoring for Hurricane and Kickapoo Creek Watersheds, Water Year 2000–2002: Pilot Watershed Program*. Illinois State Water Survey Contract Report 2006-03. <http://hdl.handle.net/2142/8910>
- Keefer, L.L. and E. Bauer. 2005. *Watershed Monitoring for the Lake Decatur Watershed, 2000-2003*. Illinois State Water Survey Contract Report 2005-09. <http://hdl.handle.net/2142/94228>
- Demissie, M., R. Xia, L. Keefer, and N. Bhowmik. 2004. *The Sediment Budget of the Illinois River*. ISWS Contract Report 2004-13. <http://hdl.handle.net/2142/8945>
- Keefer, L.L., 2004. *Sediment and Water Quality Monitoring for the Hurricane and Kickapoo Creek Watersheds, Coles and Cumberland Counties, Illinois*. Illinois State Water Survey Contract Report 2004-05. <http://hdl.handle.net/2142/94217>
- Keefer, L. L., 2003. *Sediment and Water Quality Monitoring for the Vermilion River and Little Vermilion River Watersheds*. Illinois State Water Survey Contract Report 2003-06. <http://hdl.handle.net/2142/94209>
- Keefer, L and S. Jones. 2002. *Land Use*, In Critical Trends Assessment Program, Illinois Department of Natural Resources, Springfield, IL, pp. 12-13:
 -Mississippi Western Five Assessment Area, Volume 2;
 -Shawnee Area Assessment, Volume 2.
- Miller, M., L. Suloway, & L. Keefer. 2002. *Wetlands*, In Critical Trends Assessment Program, Illinois Department of Natural Resources, Springfield, IL, pp. 7-12:
 -Mississippi Western Five Assessment Area, Volume 2;
 -Shawnee Area Assessment, Volume 2.
- Keefer, L. and M. Demissie. 2002. *Watershed Monitoring for the Lake Decatur Watershed, 1999-2000*. Illinois State Water Survey Contract Report 2002-01. <http://hdl.handle.net/2142/94194>

- Keefer, L. 2001. *Land Use*, In Critical Trends Assessment Program: Illinois River Bluffs Assessment Area, Volume 2; Upper Rock River Assessment Area, Volume 2; Big Muddy River Assessment Area, Volume 2; La Moines River Assessment Area, Volume 2; Illinois Department of Natural Resources, Springfield, IL.
- Miller, M., Suloway, L., and Keefer, L. 2001. *Wetlands*, In Critical Trends Assessment Program: Illinois River Bluffs Assessment Area, Volume 2; Upper Rock River Assessment Area, Volume 2; Big Muddy River Assessment Area, Volume 2; La Moines River Assessment Area, Volume 2. Illinois Department of Natural Resources, Springfield, IL.
- Demissie, M., L. Keefer, J. Slowikowski, A. Russell, T. Snider, and K. Stevenson, 2001. *Sediment and Nutrient Monitoring at Selected Watersheds within the Illinois River Watershed for Evaluating the Effectiveness of the Illinois River Conservation Reserve Enhancement Program (CREP)*. Illinois State Water Survey Contract Report 2001-12. <http://hdl.handle.net/2142/94187>
- Keefer, L. and M. Demissie. 2000. *Watershed Monitoring for the Lake Decatur Watershed, 1998-1999*. Illinois State Water Survey Contract Report 2000-06. <http://hdl.handle.net/2142/94327>
- Keefer, L. 2000. *Land Use*, In Critical Trends Assessment Program: Lower DesPlaines Assessment Area, Volume 2; Calumet Area Assessment Area, Volume 2; Lower Sangamon River Assessment Area, Volume 2; Vermilion River-Illinois River Basin Assessment Area, Volume 2; Kinkaid Assessment Area, Volume 2; Chicago River/Lake Shore Assessment Area, Volume 2. Illinois Department of Natural Resources, Springfield, IL.
- Miller, M., Suloway, L., and Keefer, L. 2000. *Wetlands*, In Critical Trends Assessment Program: Lower DesPlaines Assessment Area, Volume 2; Calumet Area Assessment Area, Volume 2; Lower Sangamon River Assessment Area, Volume 2; Vermilion River-Illinois River Basin Assessment Area, Volume 2; Kinkaid Assessment Area, Volume 2; Chicago River/Lake Shore Assessment Area, Volume 2. Illinois Department of Natural Resources, Springfield, IL.
- Demissie, M., L. Keefer, and J. Slowikowski. 2000. *Quality Assurance Project Plan (QAPP) for CREP Monitoring Project: Version 1*. Illinois State Water Survey, Champaign, Illinois.
- Keefer, L. 1999. *Land Use*, In Critical Trends Assessment Program: Prairie Parklands Assessment Area, Volume 2; DuPage River Assessment Area, Volume 2; Kaskaskia River Assessment Area, Volume 2; Vermilion River Assessment Area, Volume 2; Sangamon River Assessment Area, Volume 2; Thorn Creek Assessment Area, Volume 2.. Illinois Department of Natural Resources, Springfield, IL.
- Miller, M., Suloway, L., and Keefer, L. 1999. *Wetlands*, In Critical Trends Assessment Program: Prairie Parklands Assessment Area, Volume 2; DuPage River Assessment Area, Volume 2; Kaskaskia River Assessment Area, Volume 2; Vermilion River Assessment Area, Volume 2; Sangamon River Assessment Area, Volume 2; Thorn Creek Assessment Area, Volume 2.. Illinois Department of Natural Resources, Springfield, IL.
- Borah, D.K., M. Bera, S. Shaw, and L. Keefer. 1999. *Dynamic Modeling and Monitoring of Water, Sediment, Nutrients, and Pesticides in Agricultural Watersheds during Storm Events*. Contract Report 655. Illinois State Water Survey, Champaign, IL. <http://hdl.handle.net/2142/94322>
- Keefer, L. and M. Demissie. 1999. *Watershed Monitoring for the Lake Decatur Watershed, 1997-1998*. Illinois State Water Survey Contract Report 637, Champaign, IL. <http://hdl.handle.net/2142/94302>
- Keefer, L. 1998. *Land Use*, In Critical Trends Assessment Program: Big Rivers Area Assessment, Volume 2 (pp. 9-10); Kankakee River Area Assessment, Volume 2 (pp. 13-14); Kishwaukee River Area Assessment, Volume 2 (pp. 9-10); and Upper Des Plaines River Area Assessment, Volume 2 (pp. 10-11). Illinois Department of Natural Resources, Springfield, IL.

- Miller, M., Suloway, L., & Keefer, L. 1998. *Wetlands*, In Critical Trends Assessment Program: Big Rivers Area Assessment, Volume 2 (pp. 3-7); Kankakee River Area Assessment, Volume 2 (pp. 4-9); Kishwaukee River Area Assessment, Volume 2 (pp. 3-8); and Upper Des Plaines River Area Assessment, Volume 2 (pp. 4-9). Illinois Department of Natural Resources, Springfield, IL.
- Keefer, L. 1997. *Land Use*, In Critical Trends Assessment Program: Headwaters Area Assessment, Volume 2 (pp. 9-10); Embarras River Area Assessment, Volume 2 (pp. 11-12); Fox River Area Assessment, Volume 2 (pp. 13-14); and Mackinaw River Area Assessment, Volume 1 (pp. 37-39). Illinois Department of Natural Resources, Springfield, IL.
- Miller, M., Suloway, L., and Keefer, L. 1997. *Wetlands*, In Critical Trends Assessment Program: Headwaters Area Assessment, Volume 2 (pp. 3-7); Embarras River Area Assessment, Volume 2 (pp. 3-9); Fox River Area Assessment, Volume 2 (pp. 6-12); and Mackinaw River Area Assessment, Volume 1 (pp. 33-37). Illinois Department of Natural Resources, Springfield, IL.
- Keefer, L., M. Demissie, S. Shaw, S. Howard. 1997. *Watershed Monitoring for the Lake Decatur Watershed, 1996-1997*. Illinois State Water Survey Contract Report 620. <http://hdl.handle.net/2142/94286>
- Keefer, L., M. Demissie, D. Mayer, K. Nichols, and S. Shaw. 1996. *Watershed Monitoring and Land Use Evaluation for the Vermilion River Watershed*. Illinois State Water Survey Miscellaneous Publication 176. <http://hdl.handle.net/2142/49881>
- Keefer, L., M. Demissie, S. Shaw, and K. Nichols. 1996. *Watershed Monitoring for the Lake Decatur Watershed*. Illinois State Water Survey Contract Report 602. <http://hdl.handle.net/2142/94266>
- Keefer, L. 1996. *Calibration of a Stream Gaging Station on Sugar Creek, Sangamon County, Illinois*. Final Report. Unpublished report submitted to the City of Springfield, IL.
- Demissie, M., L. Keefer, D. Borah, V. Knapp, S. Shaw, K. Nichols, and D. Mayer. 1996. *Watershed Monitoring and Land Use Evaluation for the Lake Decatur Watershed*. Illinois State Water Survey Miscellaneous Publication 169. <http://hdl.handle.net/2142/49889>
- Demissie, M., L. Keefer, A. Akanbi, V. Knapp, S. Shaw, and E. Brown. 1994. *Watershed Monitoring and Land Use Evaluation for the Lake Decatur Watershed*. Illinois State Water Survey Miscellaneous Publication 159. <http://hdl.handle.net/2142/49898>
- Al-Weshah, R., L. Keefer, and M. Demissie. 1993. *The Role of Wetlands in Stormwater Runoff for the Flint and Mutton Creek Watersheds, Lake County, Illinois*. Illinois State Water Survey Contract 562. <http://hdl.handle.net/2142/94307>
- Demissie, M., L.L. Keefer, and R. Xia. 1992. *Erosion and Sedimentation in the Illinois River Basin*. Illinois DENR report ILENR/RE-WR-92/04, Springfield, IL.
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- Demissie, M., and L.L. Keefer. 1991. *Preliminary Evaluation of the Risk of Accidental Spills of Hazardous Materials in Illinois Waterways*. HWRIC RR-55, Hazardous Waste Research and Information Center, Champaign, IL. <http://hdl.handle.net/2142/1930>
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- Getahun, E. and L. Keefer (2019). “Estimating Water Quality Trends in the Fox River and its Tributaries.” *AWRA 2019 Annual Water Resources Conference*, Salt Lake City, UT, November 3-6, 2019.
- Getahun, E., and L. Keefer (2017). “Evaluating Impacts of Winter Cover Crops on Nutrient Loss Reduction at a Watershed Scale.” Inaugural NLRS Partnership Conference, Springfield, IL, November, 28-30.
- Keefer, L. and E. Getahun, 2017. Kankakee River Sediment Studies at the Illinois State Water Survey. Kankakee River Watershed Conference, Olivet Nazarene University, Bourbonnais, IL, February 10, 2017.
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Keefer, L. 2001. Poster: ISWS Pilot Watersheds Monitoring Study. 6th Annual Ecosystems Program Conference, September 25-26, 2001, Grafton, IL.

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Presentations [Conference, Symposium, Seminar, Meeting with Abstract] (48)

Keefer, L.L. 2019. *Illinois State Water Survey: 125 years of contributions to water resources of Illinois*, American Water Resources Association Annual Conference, Salt Lake City, UT, Nov. 4-7, 2019

Keefer, L.L. 2019. *Sediment and nutrient loads in Illinois watersheds: What do we know today?*. Lake Springfield Watershed Resource Planning Committee, Lake Springfield Watershed Informational meeting, March 5, 2019, Auburn, IL.

Getahun, E., and L. Keefer. 2017. *Coupled Optimization-Watershed Modeling System for Evaluating Water Quality Benefits of Agricultural Best Management Practices*. PRI Lightning Talks, Fall 2017.

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Keefer, L. L.. 2011. *Lake Decatur Watershed – 15 Years: Nitrates and Trends*. 2011 Biennial Governor's Conference on the Management of the Illinois River System: A National Opportunity, Peoria, IL, October 4-6, 2011.

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- Keefer, L.L. 2004. *Hydrologic, Sediment, and Nutrient Monitoring in Illinois Watersheds*. Connecting Illinois Watersheds Conference, Peoria, IL, February 5-6, 2004.
- Keefer, L. and B. Rhoads. 2003. *Geomorphic Assessment Protocols for Evaluating Stream-Channel Stability in Illinois Watersheds*. Association of American Geographers 99th Annual Meeting, March 4-8, 2003, New Orleans, Louisiana.
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- Keefer, L., J. Slowikowski, and A. Russell. 2002. *Watershed Monitoring Techniques at the Illinois State Water Survey*. Illinois Water Environment Association Annual Conference, March 13, 2002, Rockford, IL.
- Keefer, L. 2001. *Saving our Land and Water*. Invited by American Association of University Women, April 2, 2001, Danville, IL.
- Keefer, L. 2001. *Nitrogen in Rivers and Reservoirs*. C-FAR Water-Quality Strategic Research Initiative - Water Quality Forum, March 1, 2001, Springfield, IL.
- Keefer, L., and M. Demissie. 2000. *Sediment and Nutrient Monitoring Program for the Illinois River Conservation Reserve Enhancement Program*. Session on Illinois River: Lessons to be learned. Moderator: Richards Sparks. Environmental Horizons '99 Conference, March 27-28, 2000, Champaign, IL.
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- Keefer, L. 1999. *Panel Discussion: The Nitrogen Issues, from Central Illinois to the Gulf of Mexico*. Other Panel Members: Dave Kovacic and David White; Moderator: Richards Sparks. Environmental Horizons '99 Conference, April 22, 1999, Champaign, IL.
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- L. Keefer. 1998. *Water Quality Issues in Central Illinois: Nitrates and Sediment*. Keynote speaker at Enhancing Chemistry Conference, University of Illinois, March 6, 1998.
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- Keefer, L. L. 1995. *Lake Decatur Watershed Nitrate Study First Year Results & How Big is the Nitrate Problem: A Regional Perspective*. Illinois Lake Management Association (ILMA) 10th Annual Conference, Lisle, IL, April 20-22, 1995.
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Other (4)

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- Keefer, L.L. 2006. *Multi-Scale Geomorphic Assessment Approach for Streams in the Southern Illinois Region: Case Study, Big Creek Watershed, Pulaski and Union Counties, Illinois. Master's Thesis, Department of Geography, University of Illinois at Urbana-Champaign.***
<http://hdl.handle.net/2142/103432>.
- Contributor on: Woods, A.J., J.M. Omernik, and B.C. Moran. 2006. U.S. Environmental Protection Agency Level IV Ecoregions of Illinois. Posted on USEPA-Western Ecology Division website: <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-5#pane-11>.

John, S., D. Kane, D. Bullock, D. White, H. Andrews, L. Keefer and G. Monti (1997). Feasibility Study of Lake Decatur Watershed Management Alternatives. Prepared by Environmental Planning and Economics, Inc., Decatur, IL for City of Decatur.

Interviews (2)

WSSU (Springfield) radio interview (6/29/93). Interviewed regarding the Lake Decatur project in particular and general information about Lake Springfield.

Farm Industry News Magazine, Minneapolis, MN; Will troubled waters regulate your nitrogen buys? Hypoxia: Hype or Hot Water? [Interviewed and written by Jodie Wehrspann. Concerning the Lake Decatur Watershed Nitrate Study]. Volume 30, No. 4, February 1997, pp. 84-86.

Invited Lecturer or Trainer (10)

Guest Lecturer for Landscape Architecture 336 course taught by UIUC Professor David Kovacic on February 11, 2011. Gave a presentation titled: *Nitrogen and Sediment Monitoring in Illinois – What are we learning.*

Invited Seminar Speaker. *Multi-Scale Illinois Geomorphic Assessment Approach for More Effective River Restoration.* Eastern Illinois University-Geography Awareness Week, November 16, 2010, Charleston, IL.

Invited Seminar Speaker: *Multi-Scale Geomorphic Assessments for Illinois Landscapes.* Illinois State Geological Survey Seminar Series, May 10, 2010, Urbana, IL.

Guest Lecturer for the NRES 285EM course: *Field Experience*, taught by UIUC Professor Robert Hudson on October 30, 2009. Presented fluvial process geomorphology concepts and watershed approach to the Illinois Geomorphic Assessment Protocol.

Invited Seminar Speaker: *Hydrologic, hydraulic, and sediment studies in the Cache River Basin, Illinois.* Northwestern University, Civil & Environmental Engineering Department, May 10, 2006, Chicago, IL.

Trainer: *Stream Hydrology and Geomorphology: What's Driving the System?* IDNR Training: Streams and Watersheds: Processes, Problems, and Procedures. February 19-20, 2003, Springfield, IL.

Guest lecturer for the GEOG 210 course: *Contemporary Social and Environmental Problems*, taught at the U of I by Prof. Bruce Rhoads on March 18, 1998. Laura presented the Lake Decatur Watershed Study with emphasis on watershed and hydrology principals in combination with nitrate concentrations.

Guest lecturer for the Natural Resources and Environmental Studies (NRES) 401 course: *Watershed Hydrology*, taught at the U of I by Prof. Greg McIssac on March 5, 1998. Laura presented the Lake Decatur Watershed Study with emphasis on watershed hydrology principals in combination with nitrate concentrations.

Guest lecturer for a U of I Agriculture Engineering 396 course: *Nonpoint Source Pollution and Control*, taught at the U of I by Prof. Richard Cooke on February 25, 1997. Laura presented the Lake Decatur Watershed Study and how it models a "watershed approach" in monitoring flow and nitrates. Several faculty members joined the class to hear the presentation.

Invited by College of ACES, University of Illinois to participate in an information exchange with a USDA designate from Puerto Rico. Dr. Maria Del Carmen Libran Salas, Assistant Professor, Department of Horticulture, University of Puerto Rico was a recipient of a USDA internship program to learn how to monitor water quality in watersheds in Puerto Rico by studying research in the USA. Several ISWS watershed studies were presented as well as College of ACES studies.

Research Projects:

[Principal Investigator or Co-Principal Investigator; 29 projects (funded by federal, state, and local agencies); totaling over \$9,300,000]

Project Title: *Hydrologic, Sediment and Nutrient Monitoring for Evaluating the Effectiveness of the Illinois Conservation Reserve Enhancement Program (CREP): Illinois and Kaskaskia River Basins*
Principal Investigator(s): L. Keefer, E. Bauer & K. Stevenson
Funding Agency: Illinois Department of Natural Resources
Funding: \$809,056
Project Duration: October 2018-June 2020

Project Title: *Hydrologic, Sediment and Nutrient Monitoring for Evaluating the Effectiveness of the Illinois Conservation Reserve Enhancement Program (CREP): Illinois and Kaskaskia River Basins*
Principal Investigator(s): L. Keefer and M. Demissie
Funding Agency: Illinois Department of Natural Resources
Funding: \$888,182
Project Duration: July 2016-June 2018

Project Title: *Critical Zone Observatory Network for Intensively Managed Landscapes (IML-CZO)*
Principal Investigator(s): Praveen Kumar and Alison Anders (UIUC) & Thanos Papanicolaou (Univ. of Iowa); L. Keefer (Senior Investigator and Upper Sangamon River Site Coordinator)
Funding Agency: National Science Foundation
Funding: \$4,750,000 (ISWS portion approximately \$350,000-direct costs)
Project Duration: Dec. 2013-Nov. 2018; NCE through Sept. 2019

Project Title: *Surficial Transport and Storage in the Upper Sangamon River Basin: Characterizing Sediment Dynamics Across Gradients of Change*
Principal Investigator(s): P. Kumar, L. Keefer, A. Anders, B. Rhoads, J. Peschel, and G. Parker
Funding Agency: NGRREC
Funding: \$75,000 (ISWS \$30,000)
Project Duration: 2013-2014

Project Title: *Monitoring and Assessment of Aquatic Life in the Kaskaskia River for Evaluating IDNR Private Lands Program*
Principal Investigator(s): M. Demissie (L. Keefer)
Funding Agency: Illinois Department of Natural Resources
Funding: \$674,049
Project Duration: 2013-2016

Project Title: *Monitoring and Assessment of Aquatic Life in the Illinois River for Evaluating IDNR Private Lands Program*
Principal Investigator(s): M. Demissie (L. Keefer)
Funding Agency: Illinois Department of Natural Resources
Funding: \$725,951
Project Duration: 2013-2016

Project Title: *Evaluation of Water Surface Elevation and Velocity Profiles in the Lower Cache River for Alternative Control Structures*
Principal Investigator(s): L. Keefer
Funding Agency: Shawnee RC&D
Funding: \$ 11,009
Project Duration: 5/15/12 – 7/31/13

Project Title: *Evaluating the Water Quality Impacts of Best Management Practices in Lake Decatur Watersheds*
Principal Investigator(s): E. Bekele and L. Keefer
Funding Agency: IEPA (Section 604b Grant)
Funding: \$ 151,099 (Requested: \$92,974)
Project Duration: 4/1/12 – 5/31/14

Project Title: *Update and Expansion of Cache River Basin Hydrologic and Hydraulic Models for Development of Pulaski County DFIRM maps*
Principal Investigator(s): S. McConkey and G. Heistand, CHAMP; and L. Keefer (collaborator)
Funding Agency: FEMA
Funding: \$ 59,700 (w/o F&A)
Project Duration: 2011-2012
Details: Funding appropriations made available to ISWS Cache River H&H modeling team (Keefer, Lian, and Bekele) to update and expand model. Funding via grant from FEMA to ISWS-CHAMP.

Project Title: *Geomorphic Assessment of Middle and Lower Swan Lake Watershed, Calhoun County, Illinois*
Principal Investigator(s): L. Keefer
Funding Agency: U.S. Fish and Wildlife Service
Funding: \$ 27,312
Project Duration: 2008-2009

Project Title: *Upper Sangamon River Watershed Monitoring for the USEPA Targeted Watershed Study*
Principal Investigator(s): L. Keefer
Funding Agency: Agricultural Watershed Institute (AWI) – USEPA Region 5 Watershed Initiative Grant
Funding: \$ 243,966
Project Duration: 2005-2009

Project Title: *Watershed Monitoring for the Lake Decatur Watershed*
Principal Investigator(s): L. Keefer and E. Bauer
Funding Agency: City of Decatur
Funding: \$ 134,702 [15-year (1993-2008) total: \$1,352,725]
Project Duration: 2004-2008

Project Title: *Hydrologic, Sediment, and Geomorphic Monitoring for the Big Creek Watershed-Cache River Basin*
Principal Investigator(s): L. Keefer
Funding Agency: Illinois Department of Natural Resources (IDNR)
Funding: \$ 113,738
Project Duration: 2004-2007

Project Title: *Watershed Monitoring for the Lake Decatur Watershed*
Principal Investigator(s): L. Keefer
Funding Agency: City of Decatur
Funding: \$ 116,515
Project Duration: 2001-2003

Project Title: *Hurricane Creek Water Quality Monitoring*
Principal Investigator(s): L. Keefer
Funding Agency: Illinois Department of Natural Resources
Funding: \$ 103,777
Project Duration: 1999-2003

Project Title: *Sediment & Water Quality Monitoring in the Vermilion & Little Vermilion River Watersheds*
Principal Investigator(s): L. Keefer
Funding Agency: Illinois Department of Natural Resources
Funding: \$ 115,437
Project Duration: 1999-2002

Project Title: *Watershed Monitoring in Support of WQ-SRI Studies: Upper Sangamon River*
Principal Investigator(s): L. Keefer
Funding Agency: C-FAR, WQ-SRI
Funding: \$ 152,382
Project Duration: 1999-2003

Project Title: *Watershed Monitoring in the Cache River: Big Creek Watershed*
Principal Investigator(s): L. Keefer
Funding Agency: C-FAR, WQ-SRI
Funding: \$ 10,000
Project Duration: 1999-2000

Project Title: *Sediment and Nutrient Monitoring at Selected Watersheds within the Illinois River Watershed for Evaluation of the Effectiveness of the Illinois River Conservation Enhancement Program (CREP)*
Principal Investigator(s): M. Demissie & L. Keefer
Funding Agency: Illinois Department of Natural Resources
Funding: \$2,874,716
Project Duration: 1999-2012

Project Title: *Hydrologic, Sediment, and Nutrient Monitoring for the Interagency Pilot Watershed Program*
Principal Investigator(s): L. Keefer & M. Demissie
Funding Agency: Illinois Department of Natural Resources
Funding: \$854,846
Project Duration: 1999-2003

Project Title: *Hydrologic and Sediment Transport Analyses for the Big Creek Watershed of the Cache River Basin*
Principal Investigator(s): M. Demissie, L. Keefer & R. Allgire
Funding Agency: Illinois Department of Natural Resources
Funding: \$40,145
Project Duration: 1998-1999

Project Title: *Dynamic Modeling of Sediment, Nutrient, and Pesticide Transport in Agricultural Watersheds during Severe Storm Events*
Principal Investigator(s): D. Borah, M. Demissie, & L. Keefer
Funding Agency: Illinois Groundwater Consortium
Funding: \$111,016
Project Duration: 1997-1999

Project Title: *Feasibility Study of Lake Decatur Watershed Management Alternatives*
Principal Investigator(s): L. Keefer
Funding agency: Environmental Planning and Economics, Inc.
Funding: \$ 9,360
Project Duration: 1997

Project Title: *Watershed Monitoring for the Lake Decatur Watershed*
Principal Investigator(s): L. Keefer and M. Demissie
Funding Agency: City of Decatur
Funding: \$ 176,068
Project Duration: 1995-2000

Project Title: *Calibration of a Stream Gaging Station on Sugar Creek, Sangamon County*
Principal Investigator(s): L. Keefer
Funding Agency: City of Springfield
Funding: \$4,430
Project Duration: 1994-1995

Project Title: *Watershed Monitoring and Land Use Evaluation for the Vermilion River Watershed*
Principal Investigator(s): L. Keefer & M. Demissie
Funding Agency: Northern Illinois Water Corporation
Funding: \$177,369
Project Duration: 1993-1996

Project Title: *Watershed Monitoring and Land Use Evaluation for the Lake Decatur Watershed*
Principal Investigator(s): M. Demissie & L. Keefer
Funding Agency: City of Decatur
Funding: \$385,440
Project Duration: 1993-1995

Project Title: *Development of Physical and Hydrologic Parameters Database for the Evaluation of Wetland Functions in Illinois*
Principal Investigator(s): M. Demissie, L. Keefer, & A. Khan
Funding Agency: Illinois Department of Energy & Natural Resources
Funding: \$70,084
Project Duration: 1991-1992

Project Title: *Erosion and Sediment Management Alternatives for the Illinois River*
Principal Investigator(s): M. Demissie & L. Keefer
Funding Agency: Illinois Department of Energy & Natural Resources
Funding: \$89,968
Project Duration: 1990-1991