

Frank deNoyelles

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PRESENT POSITION:

Professor, Department of Ecology and Evolutionary Biology, University of Kansas.
Deputy Director, Kansas Biological Survey, State Agency and Research Center, Campus West,
University of Kansas.
Director, University of Kansas Experimental Pond Facility, University of Kansas Field Station
and Ecological Reserves, University of Kansas.

EDUCATION:

A.B., Gettysburg College, Gettysburg, PA. 1963. Biology Major

M.S., University of Nebraska, Lincoln, NB. 1966. Thesis: Factors affecting the distribution of
phytoplankton in a double-cell sewage lagoon.

Ph.D., Cornell University, Ithaca, NY. 1971. Dissertation: Factors affecting phytoplankton
distribution in eight replicated unfertilized and fertilized ponds.

PROFESSIONAL EXPERIENCE:

Professor 1983-present, Aquatic Ecology and Environmental Science, University of Kansas.
Director, Kansas Aquatic Mesocosm Program, University of Kansas, 1977-present.
Deputy Director, Kansas Biological Survey, 1986-present.
Chair, Environmental Studies Program Advisory Committee, 2000-2002.
Executive Committee Member, Department of Ecology and Evolutionary Biology, 1998-1999
and 2008-2009.
Executive Committee Member, Environmental Studies Program, 2009, 2011-2013.
Visiting Scientist, Experimental Lakes Area, Department of Fisheries and Oceans, Canadian
Government, 1976-85, 1996-99.
Acting Director, Kansas Biological Survey, 1991-94.
Visiting Scientist, Glacial Lakes Experimental Ecosystem Site, U.S. Forest Service, Snowy
Mountain Range, Wyoming, 1988-94.
Advisor, Aquatic Mesocosm Program Development, USEPA Office of Pesticide Programs,
1986-1994.
Advisor, Ecological Effects Testing with Outdoor Mesocosms, Industry, 1987-1994.
Chairperson, Environmental Studies Program, University of Kansas, 1985-90.

Visiting Professor, Kellogg Biological Station, Michigan State University, Summer 1977.
Assistant Professor 1975-77, Associate Professor 1978-82, Aquatic Ecology and Environmental Science, University of Kansas.
Director, Ecology Research Laboratory and Experimental Pond Facility, University of Oklahoma, 1973-75.
Assistant Professor, Aquatic Ecology and Ecology, Zoology Department, University of Oklahoma, 1972-75.
Research Associate, Ecology & Systematics (Hubbard Brook Watershed Project), Cornell University, 1971.
Lecturer in Limnology and Post-Doctoral Fellow (with G.E. Likens), Ecology & Systematics, Cornell University, 1970-71.
National Institute of Health Traineeship, Cornell University, 1967-69.
Teaching Assistant, Genetics, Development & Physiology, Cornell University, 1966-67.
Research and Teaching Assistant, Botany, University of Nebraska, 1963-66.

PROFESSIONAL AFFILIATIONS (past and present):

Phi Kappa Phi;
Sigma Xi;
American Society of Limnology and Oceanography;
Phycological Society of America;
Ecological Society

DEPARTMENTAL SERVICES:

Committees served on: Admissions and Awards; Weekly Seminar; Field Facilities; Promotion and Tenure; Student Affairs; Research Awards; Curriculum; Admissions; University Graduate Studies; CAUSE Grant Steering; search committees; University Environmental Studies; College Chairpersons Review; Greenhouse Committee; Task Force to Review Interdisciplinary Programs; Campus Recycling Task Force; City Recycling Task Force; Advisory Committee for Research, Graduate Studies, and Public Service; Advisory Committee for University's Center for Research, Inc.; Long-range Departmental Planning; department executive committee.

Committees chaired: Experimental Pond Facility Design and Construction; Experimental Pond Facility; Search Committee for Director of Environmental Studies; Great Plains Limnological Association 1979 Meeting; Search Committee for Aquatic Ecologist; Biology Grant Development; Chairperson, Environmental Studies Program; City Recycling Advisory Board; Ecology and Population Biology Program; 8 Ph.D. and 30 M.A. students.

Other services: Advisor, Environmental Studies and University Athletic Program; University of Kansas representative to the National Institute of Ecology (1975-77), Advisor, Environmental Studies student organization and the University Audubon Society chapter.

Courses taught: Principles of Ecology; Limnology; Phytoplankton Taxonomy; Freshwater

Algae (summer session, Kellogg Biological Station, Michigan State University); Principles of Environmental Studies; Field Work in Environmental Studies; Environmental Studies Seminars; Algal Ecology; Aquatic Biology; Experimental Limnology; Ecology of Water Pollution; Ecosystem-level Hazard Evaluation; Ecological Consequences of the City; Plankton Ecology; Ecosystem Management; Limnology and Aquatic Ecology; Laboratory in Limnology and Aquatic Ecology; Lake Ecology; Field and Laboratory Methods in Ecology.

For nearly 50 years now with my mostly aquatic but also terrestrial ecology teaching I have always believed it to be very important that students “go out there” and experience the environment. Thinking back through my years of so often teaching courses with field labs, I recognize that I have led or participated in more than 1000 class field trips of two to three hours each with usually 10 to 15 students.

KANSAS BIOLOGICAL SURVEY RESPONSIBILITIES: as Deputy Director

Support Director for research development and long-range planning;
Participate in budget planning, staff evaluations, and salary decisions;
Liaison between Director and staff for some issues and decision-making processes;
Work with Director involving issues and actions with other state agencies and groups;
Help to coordinate the use and maintenance of 20 KBS boats;
Serve as Director of the Kansas Aquatic Mesocosm Program (KAMP) at Field Station;
Coordinate use of KAMP's 77 0.04 ha ponds, 30 other size ponds and 74 10 m³ tanks;
Coordinate use of KAMP's 3 ha 13 m deep Cross Reservoir and a 1200 ft² laboratory;
Supervise Field Station operations, liaison between Director and field station personnel;
Member of 8-person Field Station Operations Committee that organizes operations;
Member of Field Station Executive Committee of faculty, staff and students;
Review Field Station maintenance requests for equipment, buildings and properties;
Participate in organizing construction and facilities development projects at Field Station;
Coordinate long range public education planning for Field Station;
Participate in public fundraising for Field Station land acquisition and public education;
Participate in design and location of Field Station public education facilities like new trails;
Participate in organizing Field Station events including dedications, meetings, and socials.

RESEARCH INTERESTS:

Freshwater ecology; aquatic plant management and control; factors affecting phytoplankton distribution; in situ continuous culture studies of natural plankton communities; isolation and culture of algae; short term responses of aquatic ecosystems to nutrient enrichment, pesticide and heavy metal exposure; the ecology of phytoplankton in lakes at Experimental Lakes Area of Canada; phytoplankton taxonomy; effects of acid precipitation on lake plankton; aquatic microcosms and mesocosms for toxicant hazard assessment; development and use of aquatic mesocosms for ecological effects testing; responses of alpine aquatic ecosystems to acidification and global climate change; responses of stream communities to perturbation; biodegradation of organic contaminants; spawning behavior and pond culturing of a federally

protected stream fish; reservoir siltation and restoration; pond and reservoir management; mechanical aquatic weed control; reservoir sediment dredging; vertical migration of phytoplankton; phytoplankton behavior related to light and temperature conditions; biofuel production from mass production and harvest of algae; reservoir sedimentation and ecohydrology implications; reservoir sedimentation basic ecology, rate projections, impacts, response actions.

GRANTS:

- Development and evaluation of two types of in situ continuous culture systems for studying phytoplankton population dynamics. NSF, Sep 74-Jan 78, \$45,600.
- Assessment of the eutrophication of an eastern Kansas reservoir. KU, Sep 75-Jun 76, \$2,100.
- The effects of various pollutants on common species of "clean water" algae. KU Biomed., Oct 75-Sep 76, \$2,358.
- Development of a laboratory technique for studying environmental factors affecting algal competition during eutrophication. KU, Jul 76-Jun 77, \$2,747.
- Assessment of species level effects of heavy metal pollutants in aquatic food chains. KU Biomed., May 77-Apr 78, \$1,800.
- Preliminary studies with Nelson Area Experimental Pond Facility. KU, Jul 77-Jun 78, \$3,900.
- Herbicides in Kansas waters---evaluation of the effects of agricultural runoff and aquatic weed control on aquatic food chains. KS Water Resources, 78-80, \$15,000.
- Biological magnification of pesticides and heavy metals related to algal uptake. KU, Jul 78-Jun 79, \$4,365.
- Responses of experimental ponds to cadmium additions simulating pollution. KU, Jul 79-Jun 80, \$4,372.
- Experimental pond studies evaluating the effects of agricultural herbicides on aquatic food chains. EPA, Jun 79-May 80, \$35,000.
- Effects of commercial sand dredging on the ecology of the lower Kansas River (with F. Cross). Corps of Eng., Jun 79-May 82, \$234,000.
- Effects of herbicide runoff in some Kansas watersheds. KS Dept. of Health & Environment, Jul 80-Jun 81, \$9,000.
- Studying phytoplankton competition by manipulating selected species. KU, Jul 80-Jun 81, \$2,400.
- Studies in natural aquatic habitats of the effects of agricultural herbicides on aquatic food chains. EPA, Mar 81-Mar 83, \$123,644.
- Deep-dwelling phytoplankton and their role in the ecology of lakes. KU, Jul 81-Jun 82, \$4,903.
- Site studies to determine the extent and potential impact of herbicide contamination in Kansas waters. Kansas Water Resources Research Institute, Apr 82-Apr 83, \$8,500.
- Causes and effects of phytoplankton responses to acid rain. KU, Jul 82-Jun 83, \$5,642.
- Microecosystems in toxicological research: experimentation with atrazine herbicide and aquatic food chains (with D. Kettle). KU Biomed., Feb 83-Apr 84, \$3,550.
- The responses of aquatic ecosystems to perturbation--patterns of response identified from experimental field studies and from literature review. EPA, Apr 83-Apr 84, \$60,103.
- A critical assessment of the influence of management practices on water quality, water treatment, and sport fishing in multipurpose reservoirs in Kansas (with S. Randtke). Kansas Water

Resources Research Institute, Aug 84-Sep 85, \$17,214.

Effects of acid precipitation on phytoplankton through changing light conditions. KU, Jul 84-Jun 85, \$1,809.

The cumulative effects of turbidity on production in aquatic ecosystems: an experimental pond study (with W. J. O'Brien). NSF, Oct 84-Oct 87, \$219,633.

Vertical distribution of zooplankton in lakes as influenced by subepilimnetic phytoplankton communities. KU, Jul 85-Jun 86, \$3,467.

Trihalomethane precursors in Kansas lakes: sources and control (with S. Randtke and C. Burkhead). Kansas Water Resources Research Institute, Jun 85-May 86, \$15,000.

Trihalomethane precursors in Kansas lakes: sources and control - year 2 (with S. Randtke). Kansas Water Resources Research Institute, Apr 86-Mar 87, \$17,687.

Effects of atrazine concentrations recorded in a large Kansas reservoir on phytoplankton from atrazine-free water (with D. G. Huggins and G. L. Howick). USGS, Apr 86-Jun 86, \$5,000.

Potential for the development of atrazine-resistant phytoplankton communities in contaminated zones of a large Kansas reservoir (with D. G. Huggins and G. L. Howick). USGS, Jul 86-Sep 86, \$5,000.

A preliminary evaluation of the impact of atrazine on the plant community of a large Kansas reservoir (with D. G. Huggins and G. L. Howick). Kansas Department of Health and Environment, Apr 86-Sep 86, \$5,000.

Milford fish hatchery water quality evaluation (with D. G. Huggins and G. L. Howick). Kansas Fish and Game Commission, Mar 86-Feb 87, \$32,700.

Biological and engineering contributions to the USGS RI/FS at the Arkansas City landfill site in south central Kansas (with D. G. Huggins and D. D. Lane). EPA (Superfund), Mar 87-Feb 88. \$55,000.

Development of experimental lake facility (pi with 8 co-pi's). KU, Jul 87-Jun 90, \$110,000.

Determination of herbicide-induced alterations of aquatic habitats in Kansas (with W. D. Kettle). Kansas Water Resources Research Institute, Apr 87-Mar 88, \$17,000.

Evaluation procedures for deicing chemicals and improved sodium chloride. Strategic Highway Research Program, Nov 87-Dec 88, \$4,500.

Aquatic Mesocosm Study, Facility. Contract with Springborn Laboratories, Inc. Oct 87-Mar 89. \$140,000; \$20,000 (direct, purchases directly by contractor to KU), \$25,000 (direct).

Aquatic Mesocosm Study, Field Study. Contract with Springborn Laboratories, Inc. Oct 87-Mar 89, \$141,881.

Aquatic Mesocosm Study, Facility. Contract with Springborn Laboratories, Inc. Oct 88-Mar 90, \$190,000; \$20,000 (direct).

Aquatic Mesocosm Study, Field Study. Contract with Springborn Laboratories, Inc. Oct 88-Mar 90, \$86,655.

Aquatic Mesocosm Study, Facility. Contract with Springborn Laboratories, Inc. Aug 90-Nov 90, \$30,000 (direct).

Aquatic Microcosm Study, Facility. Contract with Springborn Laboratories, Inc. May 89-Mar 90, \$10,000; \$21,000 (direct).

Aquatic Microcosm Study, Facility. Contract with Springborn Laboratories, Inc. Jun 90-Jun 91, \$10,000; \$21,000 (direct).

Aquatic Mesocosm Study, Facility. Contract with Springborn Laboratories, Inc. Mar 90-Mar 92,

\$200,000; \$20,000 (direct).

Aquatic Mesocosm Study, Field Study. Contract with Springborn Laboratories, Inc. Jun 90-Dec 91, \$181,694.

Aquatic Microcosm Study, Facility. Contract with Springborn Laboratories, Inc. Jun 90-Jun 91, \$10,000; \$28,500 (direct).

Aquatic Microcosm Study, Field Study. Contract with Springborn Laboratories, Inc. Jun 90-Jun 91, \$25,272.

Aquatic Microcosm Study, Field Study. Contract with Springborn Laboratories, Inc. Jun 90-Jun 91, \$20,748.

Aquatic Microcosm Study, Field Study. Contract with Springborn Laboratories, Inc. Mar 90-Mar 92, \$55,041.

Aquatic Mesocosm Study, Facility. Contract with Springborn Laboratories, Inc. Jun 91-Jun 94, \$150,000, \$15,000; \$20,000 (direct).

Aquatic Mesocosm Study, Lab. Contract with Springborn Laboratories, Inc. Jun 88 -Dec 91, \$35,600.

Aquatic Microcosm Studies (3), Facility. Contract with Springborn Laboratories, Inc. Jun 92-Mar 93, \$30,000; \$36,000 (dir).

Aquatic Microcosm Studies (3), Field Study. Contract with Springborn Laboratories, Inc. Jun 92-Mar 93, \$99,429.

Evaluation procedures for deicing chemicals and improved sodium chloride. Strategic Highway Research Program, Jun 89-May 90, \$52,000.

Acid precipitation in the Rocky Mountains: alpine stream insect communities as early indicators of effects. KU, Jul 89-Jun 90, \$6,363.

Tri-state watershed monitoring project. USEPA, Jun 91-Jun 1992, \$1,250,000. (co-pi with D. Huggins and M. Johnson as PI's).

Modeling ecosystems under stress (with M. Johnson and D. Huggins). EPA, Duluth Laboratory, Jun 90-Mar 91, \$7,500.

Ecology of a small Kansas reservoir. Kansas Department of Health and Environment, Jun 91-Jun 92, \$50,000.

Laboratory building for the Kansas Ecological Reserves. NSF, (co-pi with seven other investigators), Feb 1991- Jul 1993, \$110,000.

Aquatic Mesocosm Study, Field Study. Contract with Springborn Laboratories, Inc. Mar 92-Jun 94, \$330,752.

Tri-state watershed monitoring project. USEPA, Jun 91 - Jun 95, \$4,600,000. (co-pi with D. Huggins and M. Johnson as PI's).

An assessment of the effects of nonpoint source pollution on the biotic integrity of Walnut Creek, and the role of riparian vegetation in mitigating nonpoint source pollution (co-pi with three others, D. Huggins, PI) USEPA, Jul 92 -Jun 95, \$308,000.

An evaluation of environmental impact statement (EIS) mitigation measures, USEPA, Jun 92-Jun 94, \$57,000.

Aquatic invertebrate studies, EG&G Rocky Flats, Inc., (co-pi with G. Howick of Ecosystem Testing Designs, Inc.), Jun 93-Jun 96, \$150,000.

Shunganunga Creek monitoring, Topeka, KS Water Department, (co-pi with G. Howick of Ecosystem Testing Designs, Inc.), Oct 93-Oct 96, \$50,000.

The role of methanotrophic bacteria in aquatic bioremediation, EPA/EPSCoR, (co-pi with D.

Graham), Oct 94-Sep 96, \$139,256.

Effects of aquatic vegetation on degradation of the pesticide atrazine in experimental ponds, USEPA, (co-pi with three other investigators), May 93-Apr 94, \$30,000.

Effects of aquatic vegetation on degradation of the pesticide cyanazine in experimental ponds, Dupont, (co-pi with three other investigators), Jun 94-Apr 95, \$5000.

Development of land use mapping and monitoring protocol for the Great Plains Region: a multitemporal remote sensing application, NASA, (co-pi with two other investigators), Mar 96-Feb 97, \$146,956.

Mapping the thermal plume in the Missouri River generated by the Nearman Power Plant, Kansas City, MO, Lutz, Daily and Brain, Aug 96-Mar 97, \$10,000.

Feasibility site plan for an environmental learning center: report to the Blue Valley School District, Stanley, KS, Apr 97-May 98, \$22,000.

Subepilimnetic conditions in stratified lakes as indicators of ecological change: a continuing research program and its application to measuring the effects of logging on lake ecosystems, Ontario Ministry of Natural Resources, Center for Northern Forest Ecosystem Research, (co-pi with D. Graham) Jun 97- Oct 97, \$9500.

Clinton Lake water quality assessment project, KS Department of Health & Environment, (co-pi with two other investigators), Jul 97-Jun 00, \$100,000.

Landscape analysis and characterization to support regional environmental assessment, USEPA, (co-pi with two other investigators), Sep 96-Dec 97, \$165,854.

Enhancement of research with experimental aquatic ecosystems at the Kansas Ecological Reserves. NSF, (co-pi with eight other investigators), Jan 1998-Dec 1999, \$10,705.

An interdisciplinary center of excellence in environmental remote sensing at the University of Kansas, NASA, (co-pi with five other investigators), 1998, \$362,676.

Water quality survey of aquatic habitats Overland Park, KS, A.G. Spanos & Co., May 98, \$1500.

Testing of molecular indicators of exposure to pesticides in tank microcosms, USEPA, (co-pi with two other investigators), May 98-Jun 00, \$50,000.

Development of land use mapping and monitoring protocol for the Great Plains Region: a multitemporal remote sensing application, continuation, NASA, (co-pi with four other investigators), Jun 98-Jun 99, \$150,000.

The biotransformation of water soluble herbicides in aerobic aquatic systems, EPA/EPSCoR, (co-pi with two other investigators), Mar 98-Mar 01, \$266,249.

Sources and control of geosmin in midwestern water supply reservoirs, (co-pi with two other investigators), USGS, Sep 98-Aug 00, \$185,292.

Subepilimnetic conditions in stratified lakes as indicators of ecological change: a continuing research program and its application to measuring the effects of logging on lake ecosystems, Ontario Ministry of Natural Resources, CNFER (co-pi with D. Graham), Oct 98-Sep 99, \$9500.

Remediation of salt water impact, Leon Waterflood, Kansas, Kansas Corporation Commission and U.S. Department of Energy, Feb 99-Feb 00, \$15,000.

Improvements to Dykes Branch Tributary, SK Design Group, Inc., Mar 99- Jun 00, \$4000.

Development of land use mapping and protocol for the Great Plains region: a multitemporal remote sensing application, (co-pi with four other investigators), NASA, Jun 99-Jun 00, \$150,000.

Comparative water quality study of Cheney Reservoir, Wichita, KS. (co-pi with two other

investigators) City of Wichita, May 99-Apr 01, \$162,762.

Water quality study of four Kansas reservoirs. (co-pi with one other investigator) State of Kansas funds, May 99-Sep 02, \$210,000.

Vegetation control in freshwater ecosystems: review. TerraMetrics, Inc. Oct 99-Feb 00, \$10,000.

Remediation of salt water impact, Leon Waterflood, Kansas, Kansas Corporation Commission and U.S. Department of Energy, Feb 01-Aug 03, \$120,000.

Study of attenuation of endocrine disrupting compounds in surrogate ecosystems and whole lakes (co-pi with one other investigator) U.S. Environmental Protection Agency, Aug 00-Aug 02, \$34,993.

Wetland determination and delineation for East Branch of Yankee Tank Creek, Lawrence, Ks. (co-pi with two other investigators), Landplan Engineering, P.A. Mar 00-Sep 00, \$5000.

Incubating commercial remote sensing products (co-pi with three other investigators), NASA, Jul 00-Jul 01, \$100,000.

Wetland and wet meadow restoration on the Robinson tract (co-pi with two other investigators) US Fish and Wildlife Service, Jun 00-Jun 05, \$10,000.

Experimental studies of multiple stressors in aquatic ecosystems: nutrient loading, herbicide residues, and public values (co-pi with five other investigators), Kansas University Research Development Fund, Mar 00 -Mar 01, \$38,793.

Fate and effects of ciprofloxacin in aquatic ecosystems (co-pi with three other investigators), Kansas University Research Development Fund, Mar 00-Mar 01, \$77,160.

Remote sensing of invasive aquatic plant obstructions in navigable waterways, (co-pi with 3 other investigators), TerraMetrics/USDOT, Aug 01-Aug 02, \$72,466.

Culture techniques for production of Topeka Shiner, *Notropis topeka* (Gilbert, 1884) in aquatic mesocosms, Kansas Wildlife and Parks, Nov 01-Dec 02, \$31,154.

Public participation and water quality protection in the Kansas River (Kaw) Valley; using the upper Wakarusa watershed as a demonstration area, Kaw Valley Heritage Alliance/EPA, Nov 01-Oct 02, \$10,000.

Fate and effects of fluoroquinolone antibacterial agents in aquatic ecosystems. (co-pi with four other investigators) U.S. Environmental Protection Agency, Mar 00-Sep 03, \$520,976.

Incubating commercial remote sensing products (co-pi with three other investigators), NASA, Apr 02-Mar 03, \$150,000.

Watershed classification system for tiered diagnosis of biological impairments: a scalable, central plains focus with national applicability (co-pi with eight other investigators), USEPA STAR, Mar 03-Mar 06, \$1,149,266.

Topeka Shiner research at the University of Kansas Field Station and Ecological Reserves, Kingsbury Family Foundation for Endangered Wildlife, 2003, \$20,000.

Enhancement of research and education facilities at the University of Kansas Field Station. National Science Foundation. (co-pi with 8 other investigators), 04-07, \$323,538 NSF+\$97,062 KU Match; Total \$420,600.

KS culture techniques for production of Topeka Shiner, *Notropis topeka* (Gilbert, 1884) in aquatic mesocosms. KS Department of Wildlife and Parks. 04-05, \$30,000 KSWP+\$9995 Match; Total \$39,995.

Requirements for specialized research transportation equipment: a unique airboat to study shallow reservoirs and rivers of the Great Plains. NSF. (co-pi with two other investigators), 04-05, \$34,850.

Models for the management of taste and odor events in Kansas reservoirs. Kansas Water Office. (co-pi with three other investigators), Jun 06-Jun 08, \$99,602.

Long-term maintenance and continued study of two distinct captive-bred populations of Topeka Shiner (*Notropis topeka*) at the University of Kansas Field Station and Ecological Reserves. US Fish and Wildlife Service and KS Department of Wildlife and Parks. (co-pi with two other investigators), Jul 07-Dec 08, \$57,000.

Assessing the condition of USEPA Region 7 large tributaries of the Missouri River: a probabilistic design approach. EPA. (co-pi with three other investigators), Jun 07-Jul 09, \$382,674.

Bathymetric surveys of Kansas reservoirs containing public water supply storage. Kansas Water Office. (co-pi with two other investigators), Jun 07-June 08, \$165,000.

Bathymetric surveys of Kansas reservoirs containing public water supply storage. Kansas Water Office. (co-pi with two other investigators), Jun 08-Jun 09, \$187,000.

Bathymetric surveys of Kansas reservoirs containing public water supply storage. Kansas Water Office. (co-pi with two other investigators), Jun 09-Jun 10, \$187,000.

Determining the utility and adaptability of remote sensing in monitoring and assessing reservoir eutrophication and turbidity for TMDL. EPA. (co-pi with three other investigators), Jun 09-May 10, \$75,000.

Feedstock to Tailpipe Program, University of Kansas Transportation Research Institute, NSF and other sources of funding, (one of 11 members), my responsibility is to mass produce algae at the field station, at the Lawrence Wastewater Treatment Plant or harvest from reservoirs for eventual lipid extraction for fuel production, Oct 08- , \$500,000.

Bathymetric surveys of Kansas reservoirs. Kansas Water Office. (co-pi with two other investigators), 2009-2010, \$156,977.

Phase VI: Climate change and energy: Basic science, impacts, and mitigation. National Science Foundation EPSCoR. (co-pi with multiple other investigators), 2009-2014, \$20,000,000.

Bathymetric surveys of Kansas reservoirs. Kansas Water Office. (co-pi with two other investigators), 2010-2011, \$160,000.

Feasibility of renewable feedstocks for production of bio-jet fuel. NASA EPSCoR. (co-pi with other investigators), 2011-2012, \$247,712.

Feedstock to tailpipe initiative: Kansas biofuels production, testing and certification laboratory. Department of Energy. (co-pi with six other investigators), 2010-2011, \$1,036,950.

S.A. Billings, PI; B.L. Foster and W.D. Kettle, Co-P.I.s; H. Alexander, F. Ballantyne, N. Brunsell, F. deNoyelles, D. Hirmas, K. Kindscher, V. Smith, J. Thorp, and J. Ward, Co-P.I.s. Facilities to enhance research and teaching at the University of Kansas Field Station. \$329,890 total budget. National Science Foundation, 01/01/12-10/31/14

Jakubauskas, M.E. and F. deNoyelles. Sediment Core Analysis for Understanding Reservoir History. \$30,000. Kansas Water Resources Institute, 2012-2013

Val H. Smith and F. deNoyelles, Algae production and harvest at the KU Field Station. \$94,013. University of Kansas Transportation Research Institute, 4/1/2011-12/31/2011.

Kansas Water Office. Bathymetric Surveys of Kansas Reservoirs. M.E. Jakubauskas P.I., J. deNoyelles, and E. A. Martinko Co-P.I.s. 7/1/11-6/30/12. Total Support \$155,000.

Kansas Water Office. Bathymetric Surveys of Kansas Reservoirs Containing Public Water Supplies. M. E. Jakubauskas P. I., J. deNoyelles and E. A. Martinko Co-P.I.s. 7/1/12-6/30/13. Total Support: \$155,000.

Kansas Water Office. Characterization and Mapping of Sediment Thickness and Pattern in John Redmond Reservoir. M. E. Jakubauskas, P.I., J. deNoyelles, and E.A. Martinko, Co-P.I.s. 7/1/13-6/30/14. Total Support: \$20,000.

Kansas Water Office. Bathymetric Survey of John Redmond Reservoir. M. E. Jakubauskas, P.I., J. deNoyelles and E.A. Martinko, Co-P.I.s. 7/1/13-6/30/14. Total support: \$50,000.

Missouri Department of Natural Resources. Development of Missouri reference wetlands. D. Huggins, P.I. J. deNoyelles and others, Co-P.I.s. 10/1/14-8/31/17. Total support: \$303,568.

KS Health Foundation. Reservoir water quality and storage changes: Potential impacts on clean water to support healthy Kansas communities. V. Ramani, P.I. J. deNoyelles and others, Co-P.I.s. 11/1/15-10/31/18. Total support: \$199,979.

KS Water Resources Institute. Reservoir Water Supply Management: Potential Impacts of Climate Change and Extreme Precipitation Events on Reservoir Water Quantity and Quality. V. Ramani, P.I. J. deNoyelles and others, Co-P.I.s. 9/1/15-8/31/18. Total support: \$238,282.

KS Water Resources Institute. Examining water and sediment storage capacity in small impoundments: Sediment capturing opportunity in the upstream of the watersheds. D. Huggins, P.I. J. deNoyelles and others, Co-P.I.s. 3/1/16-2/28/18. Total support: \$29,994.

Environmental Protection Agency Region 7; KS Water Office. Development of wetlands in aging reservoirs: Opportunities to enhance wetland capacity and improve water quality. V. Ramani, P.I. J. deNoyelles and others, Co-P.I.s. 1/1/16-12/31/17. Total support: \$219,514.

KS Water Office. Storage and transport of water and sediment through small impoundment networks: Phase I, characterization of stored sediment quality and quantity. V. Ramani, P.I. J. deNoyelles and others, Co-P.I.s. 8/1/15-7/31/17. Total support: \$79,938.

FACILITIES DEVELOPMENT (since 1977, some also included in grants section):

Experimental ponds: design and construction coordination--14 0.045 ha ponds and a 0.35 ha reservoir pond. 1977-1979, \$81,000 (KU funds).

Experimental ponds: design and construction coordination -- 25 0.01 ha ponds. 1987, \$6000 (internal funds).

Renovation, experimental ponds: plan and coordinate sediment removal followed by sediment addition--12 0.045 ha ponds. 1987, \$45,000 (direct, purchases by contractor to KU).

Experimental ponds: design and construction coordination--14 0.045 ha ponds, one 0.8 ha reservoir pond and four 0.5 ha storage ponds. 1987-1988, \$105,000, \$20,000 (direct).

Reservoir: design and construction coordination-3.0 ha. 1987-1991, \$110,000 (KU funds), \$50,000.

Experimental ponds: design and construction coordination--14 0.045 ha ponds. 1989-1990, \$80,000, \$20,000 (direct).

Experimental tanks: design and installation--74 12 m³ tanks incubated in ponds. 1989, \$111,000 (direct).

Mobile laboratory design and installation--truck and 80 ft². lab. 1989, \$24,000.

Field laboratory: design and construction coordination--1500 ft² building, facilities, and

equipment. 1989-1990, \$130,000.

Experimental ponds: design and construction coordination--7 0.045 ha ponds. 1990, \$30,000 (direct).

Experimental stream site development: design and construction coordination of future experimental stream facility. 1991, \$10,000.

Laboratory building for the Kansas Ecological Reserves. 2600 ft² building for research and teaching, NSF, (co-pi with seven other investigators), Feb 1991- Jul 1993, \$110,000.

Experimental ponds: design and construction coordination--28 0.045 ha ponds. 1991, \$120,000, \$20,000 (direct).

Field laboratory, 400 ft²; facility shop, 800 ft²; facility storage building, 3,000 ft²; design and construction coordination. 1993, \$30,000.

Lake microcosms (cylinder limnocorrals, 10 m³ tank stratified lake surrogates), 30. 1994-1996, \$5000.

Enhancement of research with experimental aquatic ecosystems at the Kansas Ecological Reserves. NSF, (co-pi with eight other investigators), Jan 1998-Dec 1999, \$10,705.

Enhancement of research and education facilities at the University of Kansas Field Station. National Science Foundation. (co-pi with 8 other investigators), 2900 ft² building addition for research, teaching and public education, 2004-2007, \$323,538 NSF+\$97,062 KU Match; Total \$420,600.

Farm pond model: design—0.4 ha, 2006 (fill borrow).

Wetland model: design—0.4 ha, 2008 (fill borrow).

Facility storage building: design--3500 ft², 2008, \$60,000.

Renovation of 18 experimental ponds: empty basins, repair plumbing, scrape and smooth bottoms, 2012, \$4800.

Renovation of 21 experimental ponds: empty basins, repair plumbing, scrape and smooth bottoms, 2016, \$7500.

TECHNICAL REPORTS (since 1980, see Reservoir Restoration for 1998-present reports):

deNoyelles, F., Jr., and W. D. Kettle. 1980. Herbicides in Kansas waters-- evaluations of the effects of agricultural runoff and aquatic weed control on aquatic food chains. Final report to the Office of Water Research and Technology, Dept. of the Interior, December 1980, no. 219, Washington, DC. 40 pp.

deNoyelles, F., Jr., and W. D. Kettle. 1980. Experimental pond studies demonstrating the development of responses to a herbicide (atrazine) resulting from altered interactions among plankton species. Final report to the Environmental Protection Agency at Corvallis, Oregon. 50 pp.

Cross, F. B., F.deNoyelles, S. C. Leon, S. W. Campbell, S. L. Dewey, B. D. Heacock, and D. Weirick. 1982. Report on the impacts of commercial dredging on the fishery of the lower Kansas River. Report # DACW41-79-C-0075 for the US Army Corps of Engineers.

deNoyelles, F., Jr., W. D. Kettle, and A. M. Kadoum. 1982. Plankton responses in experimental ponds to atrazine, the most heavily used pesticide in the United States. Environmental Protection Agency in-house report, Corvallis, OR. 14 pp.

Cross, F., and F. deNoyelles, Jr. 1982. Final report on the impacts of dredging on the fishery of the lower Kansas river. Department of the Army, Corps of Engineers, Kansas City

- District. Vol. 1 254 pp., appendix 150 pp.
- deNoyelles, F. Jr., and W. D. Kettle. 1983. Site studies to determine the extent and potential impact of herbicide contamination in Kansas waters. Final report to the Office of Water Research and Technology, Dept. of the Interior, November 1983, no. 239, Washington, DC. 43 pp.
- Randtke, S. J., and F. deNoyelles. 1985. A critical assessment of the influence of management practices on water quality, water treatment, and sport fishing in multipurpose reservoirs in Kansas. Final report to the Office of Water Research and Technology, Dept. of the Interior, September 1985, no. 252, Washington, DC. 171 pp.
- Howick, G. L., M. F. Moffett, F. deNoyelles, Jr., and D. G. Huggins. 1986. The effects of atrazine on phytoplankton in Tuttle Creek Reservoir. Rep. No. 31. Kansas Biol. Surv., Lawrence, KS.
- Randtke, S. J., F. deNoyelles, Jr., and C. E. Burkhead. 1986. Trihalomethane precursors in Kansas lakes: sources and control. Report of year one results. Final report to the Office of Water Research, Dept. of Interior, June 1986, no. 255, Washington, DC. 114 pp.
- Randtke, S. J., F. deNoyelles, Jr., and C. E. Burkhead. 1987. Trihalomethane precursors in Kansas lakes: sources and control. Final report to the Office of Water Research, Dept. of Interior, December 1987, no. 266, Washington, DC. 188 pp.
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- Chaplow, C. C., R. R. Blackburn, F. deNoyelles, Jr., C. E. Locke, and A. D. McElroy. 1988. Evaluation and testing of chemical deicers: literature review. Special Report to the Strategic Highway Research Program, project H-205. 81 pp.
- Chaplow, C. C., R. R. Blackburn, F. deNoyelles, Jr., C. E. Locke, and A. D. McElroy. 1988. Characterization and selection of chemical deicers: criteria document. Special Report to the Strategic Highway Research Program, project H-205. 52 pp.
- Randtke, S.J., F. deNoyelles Jr., C.E. Burkhead, R.E. Miller, J.E. Denne, L.R. Hathaway, and A.S. Melia. 1988. Trihalomethane precursors in Kansas water supplies: occurrence, source control measures, and impacts on drinking water treatment. In Proceedings of the Thirty-Eighth Annual Environmental Engineering Conference. 3 February 1988. University of Kansas, Lawrence, KS, pp. 47-89.
- Randtke, S.J., F. deNoyelles Jr., J.E. Denne, L.R. Hathaway, R.E. Miller, A.S. Melia, and C.E. Burkhead. 1988. Source control of THM precursors. In Proceedings of the Annual Conference of the American Water Works Association. 14-18 June 1988. Kansas City, MO, pp. 1545-1575.
- Chaplow, C. C., R. R. Blackburn, D. Darwin, F. deNoyelles, and C. E. Locke. 1990. Handbook: test methods for evaluating chemical deicers. Strategic Highway Research Program, SHRP-H/WP-90-, National Research Council, Washington, DC. 263 pp.
- Kettle, W. D. and F. deNoyelles. 1990. Determination of herbicide-induced alterations of aquatic habitats in Kansas. Final report to the Office of Water Research and Technology, Dept. of the Interior, November 1990, No. 272, Washington, DC. 53 pp.
- deNoyelles, F. and C. M. Pennuto. 1993. Follow-up evaluation of Lone Star Lake. Final report to the Kansas Department of Health and Environment. 45 pp.
- deNoyelles, F. and C. M. Pennuto. 1994. Phase II: and evaluation of environmental impact

- statement (EIS) mitigation measures. Final report to USEPA, Kansas City, KS. 27 pp.
- deNoyelles, J., C.M. Pennuto. 1994. Phase II: An evaluation of environmental impact statement (EIS) mitigation measures. Environmental Protection Agency 27 pp.
- Graham, W. David and Frank deNoyelles. 1995. The role of methanotrophic bacteria in aquatic bioremediation in a Kansas reservoir. Final report to the Office of Water Research and Technology, Dept. of the Interior, no. 3187, Water Resource Institute Washington, DC. 50 pp.
- Howick, G.L., S.P. Bergin, A.L. Clements, S.L. Dewey, J. deNoyelles. 1996. The influence of fish density on the ecological effects of an insecticide in an outdoor ecosystem-level test. Ecological Risk Assessment of Pesticides: Enhancing the Process. Boca Raton, FL: Lewis
- Graham, W., A. Taylor, and F. deNoyelles, Jr. 1997. Factors affecting biodegradation of organic contaminants in aquatic systems. Final report to the USEPA, Kansas EPA EPSCoR: Enhancement of Bioremediation Research in Kansas. 25 pp.
- Martinko, E. A., J. Whistler, J. deNoyelles, J. Griffith, D. Peterson. 2000. EPA Region VII R-EMAP Project: Landscape analysis and characterization to support regional environmental assessment (LACRA). Kansas Biological Survey, Lawrence, KS 109 pp.
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- Kettle, W., R. Hagen, J. deNoyelles, E. A. Martinko. 2001. The University of Kansas Field Station and Ecological Reserves: A Half Century of Research and Education. Kansas Biological Survey, Lawrence, KS Miscellaneous Publication Number 9:68 pp.
- Jakubauskas, M., D. Peterson, S.W. Campbell, S.D. Campbell, D. Penny, and F. deNoyelles Jr. 2003. Remote sensing of invasive aquatic plant obstruction in navigable waterways. Final report to US Department of Transportation Research and Special Programs Administration, DOT/NASA Commercial Remote Sensing and Geospatial Technology Applications to Transportation. 30 pp.
- deNoyelles, F., M. Jakubauskas and S. Randtke. 2003. Reservoir management and renovation: addressing problems in multipurpose reservoir systems. Kansas Biological Survey and Kansas Water Office technical report, 21pp.
- Randtke, S.J., S. Pan, J. deNoyelles, D.W. Graham, V. Smith, H.L. Holm. 2003. Occurrence, biodegradation, and control of geosmin and MIB in midwestern surface water supplies. Environmental Engineering Conference.
- Jakubauskas, M., J. deNoyelles. 2008. Methods for assessing sedimentation in reservoirs. http://www.ksre.ksu.edu/library/h20ql2/sections/KWRI_Book_Methods.pdf
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(see Reservoir Reports and Reservoir Restoration for 1998-present Technical Reports)

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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Kanopolis Lake, Ellsworth County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-01, 26 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Wilson Lake, Russell County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-02, 30 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Council Grove Reservoir, Morris County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-04, 29 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Wabaunsee Lake, Wabaunsee County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-07, 17 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Wellington City Lake, Sumner County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-08, 17 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2008. Bathymetric and Sediment Survey of Council Grove City Lake, Morris County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2008-10, 16 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Miola Lake, Miami County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-01, 17 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Fort Scott Lake, Bourbon County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-03, 17 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Rock Creek Lake, Bourbon County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-04, 17 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Osage City Lake, Osage County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-05, 16 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Madison City Lake, Greenwood County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-07, 17 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Wolf Creek Reservoir, Coffey County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-08, 13 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Melvern Reservoir, Osage County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-11, 30 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2009. Bathymetric and Sediment Survey of Pomona Reservoir, Osage County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2009-12, 27 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles, E. A. Martinko. 2010. Bathymetric and Sediment Survey of Fall River Reservoir, Greenwood County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program, Lawrence, KS. Report No. 2010-02
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2010. Bathymetric and Sediment Survey of Atchison County Lake, Atchison County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2010-04, 22 pp. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. Martinko. 2010. Bathymetric and Sediment Survey of Banner Creek Reservoir, Jackson County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2010-05, 17 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles and E. Martinko. 2010. Bathymetric and Sediment Survey of Sabetha-Pony Creek Lake, Brown County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2010-08, 23 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2011. Bathymetric and Sediment Survey of Augusta-Santa Fe Lake, Butler County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2011-06, 46 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2011. Bathymetric and Sediment Survey of Pleasanton City Lake (East), Linn County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2011-08, 17 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2011. Bathymetric and Sediment Survey of Thayer City Lakes, Neosho County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report Number 2011-11, 23 pp. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles, and E. A. Martinko. 2012. Bathymetric and Sediment Survey of Cheney Reservoir, Reno-Kingman-Sedgwick Counties, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report 2011-01. Submitted to Kansas Water Office.
- Jakubauskas, M., J. deNoyelles and E. A. Martinko. 2012. Bathymetric and Sediment Survey of El Dorado Reservoir, Butler County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program Report 2011-02. Submitted to Kansas Water Office.
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- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2013. Bathymetric Survey of Kirwin Reservoir, Phillips County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program. Report 2013-01.
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- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2013. Bathymetric and Sediment Survey of Sedan City Lake (Old), Chautauqua County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program. Report 2013-07.
- Jakubauskas, M., J. deNoyelles, and E. Martinko. 2014. Bathymetric Survey of John Redmond Reservoir, Coffey County, Kansas. Applied Science and Technology for Reservoir Assessment (ASTRA) Program. Report 2014-01.

WORKSHOPS ATTENDED (national 1986-1992; aquatic mesocosm program development;

served as consultant for EPA and industry for the development of the protocol for Ecological Effects Testing of pesticides being considered for market approval under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); protocol was based on the results of our studies of the ecological effects of atrazine determined with the use of earthen pond mesocosms from 1979 through 1986 (e.g., deNoyelles et al. 1982, 1985, 1989, 1994; Larson et al. 1986, Johnson et al. 1991, Dewey and deNoyelles 1994).

- Aquatic Mesocosm Workshop, EPA, Fairfax, Va., April 1986. To develop a protocol for ecosystem-level hazard assessment in pesticide registration.
- NACA Aquatic Workshop, National Agricultural Chemicals Association, Washington, DC, Oct. 1986. To consider alternatives to the EPA protocol.
- Aquatic Field Testing: Experimental Mesocosms and Field Techniques, EPA, Duluth, MN, Sep. 1987. To review an EPA mesocosm study done by Duluth EPA.
- Aquatic Effects Dialogue Group: EPA/NACA sponsored, conducted by the Conservation Foundation, Washington, DC, monthly 1990-91. To review and revise EPA mesocosm guidance document.
- SETAC-Resolve Workshop on Aquatic Microcosms, Society for Environmental Toxicology and Chemistry. Wintergreen, VA. October 1991. To assist EPA in developing the Technical guidance document for outdoor aquatic microcosm tests to support pesticide registrations.
- Development of Adaptive Strategies to Protect Biodiversity in the Midwestern United States. Kansas City, MO, May 1992. To develop Phase I of a series of two workshops.

STATE OF KANSAS RESERVOIR SEDIMENTATION AND RESTORATION PROGRAM – Contributions

The Kansas Biological Survey has provided awareness of sedimentation issues and has helped to guide state planning and actions from 1998 to the present (with J. Kastens, M. Jakubauskas, E. Martinko and others). Presentation concerning reservoir sedimentation presented to professional groups and the public since 2010 and are cited in the Papers Presented section.

- Assessment of Clinton Reservoir and its Watershed. EPA, Kansas Department of Health and Environment, (research project addressing sedimentation impacts including water quality), Oct 97-Sep 99.
- Siltation and Water Quality Issues in Kansas Reservoirs: causes, consequences and remedial actions. report to Kansas legislature, Jan 98.
- Water Quality Issues in Reservoirs: some considerations from a study of a large reservoir in Kansas, presentation Environmental Engineering Conference, Lawrence, KS, Feb 99.
- Our Vanishing Reservoirs: it is only a matter of time. white paper to TerraMetrics, Inc. (Lawrence, KS) and Strategic Weather Services, Inc. (Philadelphia, PA), (beginning long-term relationship leading to reservoir management and restoration patent), Mar 99.
- Comparative Water Quality Study of Cheney Reservoir, Kansas. Wichita, KS, (research project addressing sedimentation impacts including water quality), May 99-Nov 00.
- Public Water Supply Technical Advisory, committee member, (addressing reservoir water quality issues), 99-02.

- Mechanical Aquatic Weed Control, presentation to the Florida Section of the American Water Resources Association, Key West, FL, Jul 00.
- The Aquaplant Terminator, 15 minute video describing an aquatic vegetation removal machine for excessive growths in shallow reservoirs, Aug 00.
- Sediment Accumulation and the Impacts on the Quality of Kansas Reservoirs. proposal submitted to Kansas Legislature for a continuing program, Feb 01.
- Remote Sensing of Invasive Aquatic Plant Obstructions in Navigable Waterways. USDOT, (research project examining a consequence of sedimentation), Aug 01- Aug 02.
- Reservoir Management and Renovation: assessing problems in multipurpose reservoir systems. document submitted to the Kansas Water Office, other agencies and individuals detailing sedimentation-related issues, Jul 03.
- State of Kansas Reservoir Restoration Technical Advisory Committee member, addressing reservoir siltation and restoration, 03-08.
- Mission Lake Pilot Dredging Program (Horton, KS), phase 1, first interactions with city mayor and city manager and with involved state agencies, 04-06.
- Reservoir Management Support Program: preliminary concept paper and background, submitted to the Kansas Water Office, Sep 05.
- System, method, and computer program product for weather and terrestrial vegetation-based water renovation and management forecasting. Completion of patent application number 09/547,791, held by deNoyelles and 8 other collaborators, 06.
- A Rapidly-deployable Bathymetric Mapping System for Assessing Bottom Sediment and Aquatic Plant Distribution in Small Lakes and Reservoirs in Kansas. Submitted to the Kansas Legislature, Rep. T. Sloan, Jan 06.
- Comprehensive Reservoir Assessment and Monitoring. Submitted to Kansas water Office, Feb 06.
- ASTRA: Applied Science and Technology for Reservoir Assessment: an overview of a proposed reservoir assessment program. Submitted to Kansas Water Office, Mar 06.
- Bathymetric Surveys of Public Water Supply Reservoirs, beginning of continuing state funded program of mapping basin depth; five completed in 2006, eight completed in 2007, ten completed in 2008, twelve completed in 2009.
- Sediment Coring (depth) Surveys of Public Water Supply Reservoirs, beginning of continuing state funded program of coring for sediment depth; two completed in 2006, four completed in 2007, four completed in 2008.
- Development of Predictive Models for the Management of Taste and Odor Events in Kansas Reservoirs, (research project to study this water quality issue related to reservoir sedimentation), May 06-Jun 07.
- Preserving, protecting, and restoring Kansas Reservoirs. Presented (E. Martinko) to Kansas Reservoir Summit, Lawrence, KS, Oct 07.
- The Applied Science and Technology for Reservoir Assessment (ASTRA) Initiative of the Kansas Biological Survey: addressing the research and management information needs of Kansas reservoirs. Presented (M. Jakubauskas) to Water and the Future of Kansas, Mar 07.

- The Current State, Trend, and Spatial Variability of sediment in Kansas reservoirs and Methods for Assessment of Sedimentation in Reservoirs. Presented (M. Jakubauskas) to Water and the Future of Kansas, Mar 07.
- Preserving, protecting, and restoring Kansas Reservoirs. Presented (E. Martinko) to Kansas Reservoir Summit, Lawrence, KS, Oct 07.
- Reservoir Sedimentation and Water Quality: conditions, consequences, and management. Presented to Delaware Basin WRAPS, Holton, KS, Dec 07.
- Mission Lake Pilot Dredging Program (Horton, KS); phase 2, planning with other state agencies during engineering phase and initial mapping and sediment coring, 07-08.
- ASTRA (Applied Science and Technology for Reservoir Assessment monthly newsletters, www.kars.ku.edu/astra, beginning July 2008.
- The current status, trend, and spatial variability of sediment in Kansas reservoirs. Presented (E. Martinko) to Vision 2020 Committee, Kansas House of Representatives, Topeka, KS, January 2010.
- An overview of the Kansas reservoirs research and management support program. Presented (E. Martinko) to Kansas Water Authority, Paola, KS, August 2010.
- Kansas Reservoir Assessment: Issues, implications, and initiatives. Presented (E. Martinko) to Joint Committee on Energy and Environmental Policy of the Kansas Legislature, Topeka, KS, October 2010.
- The Applied Science and Technology for Reservoir Assessment (ASTRA) Program: Addressing the research and information needs of Kansas reservoirs. Presented (M. Jakubauskas) to Kansas Natural Resources Conference, Wichita, KS, February 2010.
- Kansas Lake and Reservoir Mapping Program—the scientific basis. Presented (M. Jakubauskas) to 19th Annual Kansas Hydrology Seminar, Topeka, KS, November 2010.
- Status of Kansas reservoirs. Presented to Water and the Future of Kansas, Topeka, KS, October 2010.
- Mission Lake project completion report: Final bathymetric survey and calculation of volume of sediment removed. August 2010.
- Selected related publications (see papers published for full citation): deNoyelles and Jakubauskas 2008; Jakubauskas and deNoyelles 2008; Baker and deNoyelles 2008; Wang et al. 2005a, 2005b; Mankin et al. 2003; Randtke et al. 2003; Smith et al. 2002; Pan et al. 2002; Jakubauskas et al. 2002; Smith et al. 2000; Wang et al. 1999; deNoyelles et al. 1999; Wang et al. 1999.
- Martinko, E., deNoyelles, F., and Jakubauskas, M. 2011. Bathymetric Mapping and Sediment Studies in Kansas Reservoirs: 2010 – 2011. 28th Annual Water and the Future of Kansas Conference, Topeka, KS. September 30, 2011.
- Jakubauskas, M., Huggins, D., deNoyelles, J. Martinko, E., and Callihan, R. 2011. Whole-Lake Mapping of Total Phosphorus in Reservoir Bottom Sediments Using Acoustic Echosounder Data. 31st International Symposium of the North American Lake Management Society, Spokane, WA. October 26-28, 2011.
- Jakubauskas, M., Liechti, P., Martinko, E., deNoyelles, J. and Campbell, S. 2011. Bathymetric Mapping and Sediment Studies of Augusta City Lake and Augusta-Santa Fe Lake. 28th Annual Water and the Future of Kansas Conference, Topeka, KS. September 30, 2011.

- Jakubauskas, M., Huggins, D., deNoyelles, J., Martinko, E., Callihan, R., and Blackwood, A. 2011. Acoustic Remote Sensing of Total Phosphorus in Reservoir Bottom Sediments. 28th Annual Water and the Future of Kansas Conference, Topeka, KS. September 30, 2011.
- Huggins, D., Jakubauskas, M., Baker, D., Campbell, S., Liechti, P., and deNoyelles, F., 2011. Determining the Utility and Adaptation of Remote Sensing in Assessing Midwestern Reservoir Eutrophication and Turbidity. Pecora 18 Symposium, Herndon, VA, November 14-17, 2011.
- Jakubauskas, M., deNoyelles, J., and Martinko, E. 2012. Bathymetric Mapping and Hydroacoustics Applications in Kansas Reservoirs. Presentation at Midwest Fish and Wildlife Conference, December 11th, 2012, Wichita, KS.
- Jakubauskas, M., deNoyelles, J., Liechti, P., Martinko, E., Blackwood, A., and Niehues, N. 2012. The Curious Case of Atchison Lake Sedimentation. Governor's Conference on the Future of Water in Kansas, Topeka, KS. October 30, 2012.
- Martinko, E., K. Bosnak, M. Jakubauskas, J. deNoyelles, D. Huggins, J. Kastens, A. Shreders, D. Baker, A. Blackwood, S. Campbell, and C. Rogers. Atlas of Kansas Lakes: A resource for communities, policy makers, and planners. Publication of the Kansas Biological Survey. Governor's Conference on the Future of Water in Kansas. Topeka, KS. October 25, 2013.
- Kansas Reservoir Bypass and Removal Workshop. 8/5,6/13. Invited participant, an informal workshop of state and federal agency people and I provided summary of Kansas reservoir sedimentation conditions and consideration of actions to be taken.
- The current of status sedimentation in Kansas reservoirs. Presented (E. Martinko, J. deNoyelles, others) to Vision 2020 Committee, Kansas House of Representatives and other legislators, Topeka, KS, yearly updates on condition of sedimentation in Kansas reservoirs from 2009 to the present (2013).
- Sedimentation can't be stopped, but it can be slowed. Magazine article *Kansas Farmer*, NewsWatch feature January 2015 by Tyler Harris based on information from deNoyelles presentation Nov 13, 2014 at the Governor's Conference on the Future of Water in Kansas. www.FarmProgress.com – January 2015.
- Presentation to Kansas Department of Agriculture interns at Tuttle Creek Lake on sedimentation issues and careers (June 2015).
- Advised a group of students from Kansas State University on their class project to plan and conduct the dredging of a local pond.
- Presentation at John Redmond Reservoir for legislators and others including the dredging stakeholders and dredging engineering team (September 2015).

Beginning in 2012 and working particularly with Jude Kastens, a modeler and mathematician at KBS, we are developing sedimentation projections for this century from data we have gathered since 2007 from bathymetric mapping and sediment coring for Kansas reservoirs. We are the main group in the state making such detailed analyses and in November 2013 I began a series of agency and state conference presentations that continued through 2015. These began with the Governor's Conference on the Future of Water in Kansas in November and continued with the Kansas Natural Resources Conference in January 2014, the Kansas Department of Agriculture Dam Safety Conference in February, the Kansas Rural Water Association in March, the 64th

Annual Environmental Engineering Conference (Kansas) in April, the Kansas Academy of Science in April and others (see Papers Presented section). My presentations in 2014 and 2015 are also addressing the developing water vision for Kansas requested in 2013 to be completed by the end of 2014. The document titled *A Long-Term Vision for the Future of Water Supply in Kansas* contains more than 200 actions and I have been considering the potential for some of these to address sedimentation. With respect to this most recent *Vision* effort and more generally the following is just some of what we are reporting that we hope creates more awareness and action. I include it here because this has become a large time commitment of mine.

In Kansas there are an estimated 130,000 constructed impoundments larger than ¼-acre. Most are farm ponds but included are 6000 larger ones listed in the National Inventory of Dams (NID). Among the larger are 80 serving as drinking water supplies including 20 of the 24 federal reservoirs that provide most of the supply for 60% of Kansans receiving drinking water from reservoirs. Six of the 24 largest reservoirs in Kansas are estimated to reach 50% loss of storage volume due to sediment infilling over the next 50 years and a total of 11 by the end of the century. By the end of this century the 24 will have accumulated 2.3 billion cubic yards of sediment since the first was constructed in 1948. Removing sediment by dredging now costs six dollars a cubic yard and finding a disposal location is equally challenging. By 2022 the first of the largest reservoirs will become 50% infilled with a projected 343 million yd.³ of sediment, a level where the resources they provide are already seriously compromised. Restoring this reservoir back to its original volume will cost two billion dollars. Every year the 24 are projected to be accumulating 17.6 million yd.³ of sediment. Then there are the other 130,000 and what is happening to them recognizing that all are important resources. The many smaller ones critically protect the larger by the network of upstream basins that control flows, capture sediments and remove contaminants thus together all provide water supply, flood control and recreation for Kansas. KBS is now helping to guide the awakening to these challenges ahead and to what must be done. I recently published the following detailing these conditions and projections: deNoyelles, F. and J.H. Kastens. 2015. Reservoir sedimentation challenges Kansan.

Transactions of the Kansas Academy of Science 119: 69-81.

TOPEKA SHINER (*Notropis topeka*) PROPOGATION PROGRAM (2002-present)

Conservation research for the federally protected Topeka Shiner (*Notropis topeka*) at the field station in earthen ponds and outdoor tanks funded by the US Fish and Wildlife Service and the Kansas Department of Wildlife and Parks has propagated 20,000 fish from an original 400 collected. Two genetically distinct types are represented, one no longer found free in nature. For their unusual spawning behavior that includes a nest association with species of sunfish, a study is in progress in experimental ponds simulating stream headwater pools. This behavior, recorded by more than 100 hours of in situ video, and particular habitat disturbances in the wild are being related to their threatened condition in Great Plains headwater streams. Long-term propagation of fish includes maintaining stock for possible reintroduction attempts. A total of 9,219 fish have also been provided on 18 occasions by a federal permitting process to researchers outside of KU with examples of their publications below.

Anderson, C.A. and S.K. Sarver. 2008. Development of polymorphic microsatellite loci for the

- endangered Topeka shiner, *Notropis topeka*. *Molecular Ecology Resources* 8(2):311-313.
- Knight, G.L. and K.B. Gido. 2005. Habitat use and susceptibility to predation of four prairie stream fishes; implications for conservation of the endangered Topeka shiner. *Copeia* 2005(1): 38-47.
- Koehle, J.J. and I. Adelman. 2007. The effects of temperature, dissolved oxygen, and Asian fish tapeworm on growth and survival of the Topeka Shiner. *Transactions of the American Fisheries Society* 136(6):1607-1613.
- Pullen, R.R., W.W. Bouska, S.W. Campbell, and C.P. Paukert. Intestinal helminthes of *Cyprinella lutrensis* in Deep Creek, Kansas; prevalence and spatial distribution estimates for *Bothriocephalus acheilghanthi* and *Rhabdochona canadensis*. *J. of Parasitology*. (In press.)
- Quist, M.C., P.A. Fay, C.S. Guy, A.K. Knapp, B.N. Rubenstein. 2003. Military training effects on terrestrial and aquatic communities on a grassland military installation. *Ecological Applications* 13(2):432-442.

Conservation research continued in 2013 as we still maintain fish available for other research programs so that they do not have to be removed from natural habitats. In 2013 we prepared for an introduction of one genetic type of these fish no longer in the wild back to their original location in Kansas near the Colorado border. This work involved moving some fish from ponds to holding tanks during the summer then isolating them for more observation in tanks in the new field station greenhouse in November. They were then to be taken west but the next day USFWS postponed the introduction for “political” reasons to be planned again for spring 2014. Reintroduction did not occur in 2014 but maintaining these fish continues. I worked with USFWS and the Nature Conservancy regarding to whose land the fish were to be moved as they addressed concerns from some neighbors that property rights might be compromised if some of the fish were to later be found in their waters.

PAPERS PRESENTED (since 1974, deNoyelles as presenter and excluding most local ones):

- In situ continuous culturing of phytoplankton. University of Oklahoma, Feb. 1974.
- Field and laboratory analyses of factors affecting phytoplankton distribution and abundance as related to eutrophication. University of MN. Freshwater Biological Institute, May 1974.
- Evaluation of an in situ chemostat for studying natural phytoplankton communities. American Society of Limnology and Oceanography, University of Washington, Jun. 1974.
- Chemostats as bioassay devices for predicting the effects of nutrient and grazing pressure perturbation on plankton communities. American Society of Limnology and Oceanography, Dalhousie University, Jun. 1975.
- Factors effecting changes in algal distribution during eutrophication. Washington University, Mar. 1976.
- In situ chemostat studies of environmental factors affecting phytoplankton succession during eutrophication. American Institute of Biological Sciences, Tulane University, May 1976.
- Experimental field studies with phytoplankton communities. Experimental Lakes Area, Ontario, Canada, Aug. 1976.
- Managing productivity of farm ponds. USDA, Durant, OK, Oct. 1976.
- In situ continuous culturing for studying regional characteristics of plankton community dynamics. Great Plains Limnological Association, University of Missouri, Nov. 1976.

Continuous culture studies of phytoplankton succession. Freshwater Institute, Winnipeg, Canada, Mar. 1977.

Phytoplankton in situ continuous culturing with epilimnetic and hypolimnetic communities at the Experimental Lakes Area, Ontario. American Society of Limnology and Oceanography, Michigan State University, Jun. 1977.

Continuous culture studies of phytoplankton succession in Lakes 239 and 226. Experimental Lakes Area, Ontario, Canada, Aug. 1977.

Lake turbidity and fall blooms of phytoplankton. Great Plains Limnological Association, University of Oklahoma, Sep. 1977.

The responses of an algal community to cadmium during in situ continuous culturing. Freshwater Institute, Winnipeg, Canada, Mar. 1978.

The role of algae in lake responses to pollution. Texas Christian University, Apr. 1978.

Algal responses to cadmium: a comparison of 3 methods. Experimental Lakes Area, Ontario, Canada, Aug. 1978.

Responses of natural phytoplankton communities to cadmium: a comparison of responses from oligotrophic Canadian Shield lakes and eutrophic Great Plains reservoirs. Great Plains Limnological Association, University of Nebraska, Nov. 1978.

Microcosm studies with natural phytoplankton communities at the Experimental Lakes Area, Northwest Ontario. Symposium on Microcosms in Ecological Research, Savannah River Ecology Laboratory, South Carolina, Nov. 1978.

Experimental pond studies on the effects of toxic chemicals on aquatic food chains. Great Plains Limnological Association, University of Kansas, Nov. 1979.

Effects of herbicides on aquatic food chains. Kansas Water Resources Board, Topeka, Kansas, Apr. 1980.

Experimental pond studies with atrazine. Experimental Lakes Area, Ontario, Canada, Aug. 1980.

The effects of photosynthesis inhibiting chemicals on the structure and functioning of phytoplankton communities. Great Plains Limnological Association, University of Arkansas, Oct. 1980.

Experimental ponds as model systems for predicting the responses of lake phytoplankton communities to toxicants. International Association for Great Lakes Research, Ohio State University, Apr. 1981.

Composition and behavior of phytoplankton occupying hypolimnion chlorophyll peaks in the Experimental Lakes Area, NW Ontario. American Society of Limnology and Oceanography, University of Wisconsin, Jun. 1981.

The effect of photoinhibitory chemicals on the structure and functioning of phytoplankton communities. Ecological Society of America, Indiana University, Aug. 1981.

The structure and functioning of deep dwelling phytoplankton communities in oligotrophic lakes. University of Manitoba, Nov. 1981.

Plankton responses in experimental ponds to atrazine, the most heavily used pesticide in the United States. Freshwater Institute, Winnipeg, Canada, Nov. 1981.

Responses of plankton to atrazine. EPA Corvallis Research Laboratory, Apr. 1982.

Phytoplankton responses to the experimental acidification of a Canadian lake. Experimental Lakes Area, Ontario, Canada, Jul. 1982.

Plankton responses to nutrient, pH, heavy metal, and pesticide perturbations in closed and flow-through enclosures. Ecological Society of America, University of North Dakota,

Aug. 1983.

Phytoplankton communities in experimentally acidified and control lakes. Experimental Lakes Area, Ontario, Canada, Aug. 1983.

An eight year study of phytoplankton communities in experimentally manipulated and control lakes. Experimental Lakes Area, Ontario, Canada, Aug. 1984.

Summer phytoplankton communities in an experimentally acidified lake compared with those in reference lakes. American Society of Limnology and Oceanography, University of Minnesota, Jun. 1985.

The effects of four years of experimental acidification on the phytoplankton of a small oligotrophic lake. Experimental Lakes Area, Ontario, Canada, Aug. 1985.

Phytoplankton responses to lake acidification. Botany Department, University of Manitoba, Dec. 1985.

Effects of toxic chemicals on aquatic habitats. Northwest Kansas Groundwater Management District N. 4., Colby Community College, Colby, KS., Mar. 1986.

Impact of herbicides and fertilizers on algae and macrophytes in Kansas lakes. Kansas Acad. Sci., Emporia, KS., Apr. 1986.

Microcosms and mesocosms for testing the effects of pesticides in aquatic ecosystems. National Agricultural Chemicals Association, Washington, DC, Oct. 1986. Responses of subepilimnetic phytoplankton to experimental whole-lake acidification. Great Plains Limnological Association, University of Kansas, Oct. 1986.

Experimental lakes and ponds for assessing ecosystem response to chemical perturbation. Virginia Polytechnic Institute and State University, Mar. 1987.

Experimental ponds for aquatic mesocosm testing. FIFRA Scientific Advisory Panel, Washington, DC, Jun. 1987.

Assessing the effects of atrazine on aquatic food chains using experimental ponds. Entomological Society of America. Symposium, Using mesocosms to assess the aquatic ecological risk of pesticides: theory and practice. Boston, MA, Dec. 1987.

Whole lake and pond experiments for hazard assessment. Symposium on aquatic toxicology and hazard assessment. American Society for Testing and Materials, Reno, NV, Apr. 1988.

Whole lake acidification experiments in Canada. U.S. Forest Service, Centennial, Wyoming, Aug. 1988.

Monitoring alpine and subalpine lakes in the Rocky Mountains for effects of global climate change and acidification. U.S. Forest Service, Ft. Collins, Centennial, WY, Jul. 1989.

Changes in subepilimnetic phytoplankton as an early response to lake acidification. Ecological Society of America. University of Toronto, Aug. 1989.

Development of algal responses to chemical perturbations in whole-ecosystem toxicity testing using experimental ponds and lakes. Society of Environmental Toxicology and Chemistry, Toronto, Nov. 1989.

Ecological risk assessment with mesocosms: a review. Conservation Foundation, Washington, DC, Mar. 1990.

Ecological effects testing at the community and ecosystem levels. EPA, Duluth/University of Minnesota, Duluth, Apr. 1990.

Subepilimnetic peaks of phytoplankton biomass: implications for the subepilimnetic benthos. North American Benthological Society, Virginia Polytechnic Institute and State University, May 1990.

A technique for establishing pond mesocosms for whole ecosystem toxicity testing: rationale and evaluation. Technical Information Workshop, North American Benthological Society, VPISU, May 1990.

Subepilimnetic phytoplankton in Rocky Mountain lakes: implications for studies of global climate change and acid precipitation. Ecological Society of America, Snowbird, UT, Aug. 1990.

Freshwater simulated field studies: a review of surrogate ecosystems designed to simulate the natural environment. Society of Environmental Toxicology and Chemistry, Washington, DC, Nov. 1990.

Ecological effects testing with pond mesocosms: structural and functional components of responses of the surrogate ecosystems to stress. Entomological Society of America, New Orleans, Dec. 1990.

Possible responses of subepilimnetic phytoplankton communities in Rocky mountain lakes to acid precipitation and climate change. University of Oklahoma, September 1991.

Aquatic microcosms in ecological effects testing: perspectives on evaluating their suitability as aquatic ecosystem surrogates. Wintergreen, VA, Oct. 1991.

Aquatic ecosystem impacts of herbicides: an ecologist's view. Symposium on herbicides in runoff and surface waters: environmental and regulatory aspects. Weed Science Society of America. Denver, CO, Nov. 1992.

Cause and effect relationships between ecological stress and environmental condition. US EPA Environmental Research Laboratory. Corvallis, OR, May 1993.

Subepilimnetic phytoplankton communities in Rocky Mountain lakes: the influence of climate on biomass and species composition with implications for the effects of global climate change. Ecological Society of America. Madison, WI, Aug. 1993

Refining the use of aquatic microcosms for ecological effects testing. Symposium on the use of microcosms in ecological effects testing. Society for Environmental Toxicology and Chemistry. Houston, TX, Nov. 1993.

Integrated ecological risk assessment. Keynote address for the Ozark-Prairie Chapter, Society of Environmental Toxicology and Chemistry. Lawrence, KS, May 1994.

In situ experiments with vertically migrating subepilimnetic phytoplankton. American Society of Limnology and Oceanography. Milwaukee, WI, Jun. 1996.

Deep chlorophyll maxima in lakes: indicators of ecological change. Experimental Lakes Area, Ontario, Canada, Aug. 1996.

Ecological effects of atrazine on aquatic ecosystems. Surface Water Quality Commission, Kansas, Topeka, KS, OCT. 97.

Subepilimnetic phytoplankton communities in Canadian lakes, Center for Forest Ecosystem Research, Thunder Bay, Ontario, Canada, May 1998.

Vertical migration of subepilimnetic phytoplankton as related to changing light conditions. American Society of Limnology and Oceanography. St. Louis, MO, Jun. 1998.

Water quality issues in reservoirs: some considerations from a study of a large reservoir in Kansas. Environmental Engineering Conf., Lawrence, KS, Feb. 99.

Mechanical aquatic weed control. Florida Section of the American Water Resources Association, Key West, FL, Jul. 00.

The Aquaplant Terminator, 15 minute video describing an aquatic vegetation removal machine for excessive growths in shallow reservoirs, Aug 00.

Status of Kansas reservoirs. Presented to Water and the Future of Kansas, Topeka, KS, October 2010.

Sedimentation issues in Kansas ponds and reservoirs, Kansas Association of Conservation Districts, Wichita, KS. Nov 2011.

Ecology of problem growths of Cyanobacteria in reservoirs as related to sedimentation, Governor's Conference on the Future of Water in Kansas, Manhattan, KS. 31 Oct 2012.

Reservoir Sedimentation: Understanding the past and recognizing the future to act wisely now. Governor's Conference on the Future of Water in Kansas, Topeka, KS. October 25, 2013.

Reservoir Sedimentation: Understanding and addressing vanishing resources. Kansas Natural Resources Conference, Wichita, KS. January 30, 2014.

Current state and future outlook for Kansas reservoirs. Kansas Dam Safety Conference, Lawrence, KS. February 13, 2014.

Challenges appear as Kansas reservoirs disappear. Kansas Rural Water District Conference, Wichita, KS. March 26, 2014.

Reservoir sedimentation: An emerging issue relating to ecohydrology and climate change. Kansas Academy of Science Annual Meeting, Emporia, KS. April 5, 2014.

Reservoir sedimentation: recognize the future and challenges soon become clear but solutions not so soon. 64th Annual Engineering Conference, Lawrence, KS. April 16, 2014.

Addressing reservoir sedimentation: challenges in Kansas. Public and professional briefing on issues along with Kansas Secretary of Agriculture and the Director of the Kansas Water Office, Lawrence, KS. April 24, 2014.

Documentary addressing Kansas reservoir sedimentation for Kansas Natural Resources Council. Contributed planning and being interviewed for a portion of the documentary. June-July 2014.

Reservoir sedimentation and groundwater challenges continue in Kansas. Midwest Ground Water Conference, Lawrence, KS. September 30, 2014.

Reservoir sedimentation: challenges in Kansas. Governor's Conference on the Future of Water in Kansas. (invited plenary speaker), Manhattan, KS. November 13, 2014.

Sedimentation can't be stopped, but it can be slowed. Magazine article *Kansas Farmer*, NewsWatch feature January 2015 by Tyler Harris based on information from deNoyelles presentation Nov 13, 2014 at the Governor's Conference on the Future of Water in Kansas. www.FarmProgress.com – January 2015

Comparing reservoirs and natural lakes: fundamental differences relating to sedimentation management in Kansas. Kansas Natural Resources Conference, Wichita, KS. January 29, 2015.

Reservoir sedimentation: vision becoming action. Kansas Rural Water District Conference, Wichita, KS. March 25, 2015.

Plant growth and sediment in lakes: threatened environments become resource supplies. Transportation Engineering Conference (invited speaker), Manhattan, KS. April 14, 2015.

Many challenges of reservoir sedimentation. Kansas Department of Agriculture intern program Tuttle Creek Lake. Jun 2015.

Kansas surface water: changes, challenges and history repeating itself. Kansas Water Congress, Lawrence, KS. Aug 2015.

What lies down the road for Kansas reservoirs? Kansas Biological Survey, Lawrence, KS. Sep 2015.

Some recent (2012) presentations for phytoplankton vertical migration in Cross Reservoir

deNoyelles, J. Phytoplankton vertical migration behavior. KU Evolutionists, Lawrence, KS. 24 APR 2012.

deNoyelles, J. Microorganisms on the move for a reason: seeing is believing, Visiting scientists(12) from Notre Dame University, KUFS, 12 Oct 2012.

deNoyelles, J. Phytoplankton vertical migration behavior: observing the search for light and nutrients. weekly ecology seminar at KBS, campus 9 Nov 2012.

deNoyelles, J. Phytoplankton vertical migration: observing behavior for twenty years in a 12 meter deep Kansas reservoir. EEB department seminar Feb 2015.

(see Reservoir Restoration for 1998-present Presentations)

PAPERS PUBLISHED BY OTHERS USING THE EXPERIMENTAL PONDS (2000 to present, deNoyelles not listed as an author but participated by making available and preparing the systems)

Turner, C.R., Uy, K.L., and Everhart, R.C.. In press. Fish environmental DNA is more concentrated in aquatic sediments than surface water. *Biol. Conserv.*
<http://dx.doi.org/10.1016/j.biocon.2014.11.017>

Turner CR, Miller DJ, Coyne KJ, Corush J. 2014. Improved Methods for Capture, Extraction, and Quantitative Assay of Environmental DNA from Asian Bigheaded Carp (*Hypophthalmichthys* spp.). *PLoS ONE* 9(12): e114329. doi: 10.1371/journal.pone.0114329

Fortier M-OP, Roberts GW, Stagg-Williams SM, and Sturm BSM*. 2014. "Life Cycle Assessment of Bio-Jet Fuel from Hydrothermal Liquefaction of Microalgae." *Applied Energy*, 122, 73-82.

Roberts GW, Fortier M-O, Sturm BSM, and Stagg-Williams SM*. 2013. "Promising pathway for algal biofuels through wastewater cultivation and hydrothermal conversion." *Energy & Fuels*, 27 (2), 857-867.

Fortier M-O and Sturm BSM*. 2012. "Geographic analysis of the feasibility of collocating algal biomass production with wastewater treatment plants." *Environmental Science & Technology*, 46 (20), 11426–11434.

Bode C*, Criss M, Ising A, McCue S, Ralph S, Sharp S, Smith V, and Sturm B. 2012. "Pond Power: How to use algae to energize inquiry and interdisciplinary connections." *The Science Teacher*, Accepted – in press.

Sturm, B. S. M. and S. L. Lamer. 2011. An energy evaluation of coupling nutrient removal from wastewater with algal biomass production. *Applied Energy* 88:3499-3506.

Knapp CW*, Zhang W, Sturm BS, and Graham DW. 2010. "Differential fate of erythromycin and beta-lactam resistance genes from swine lagoon waste under different aquatic conditions." *Environmental Pollution*, 158(5), 1506-1512.

Zhang W, Sturm BS*, Knapp CW, and Graham DW. 2009. "Accumulation of tetracycline

- resistance genes in aquatic biofilms due to periodic loadings from swine lagoons.”
Environmental Science & Technology, 43(20), 7643-7650.
- Knapp, C.W., L. Lagadic, T. Caquet, M.L. Hanson, and D.W. Graham. 2005. Response of water column microbial communities to sudden exposure to Deltamethrin in aquatic mesocosms. *FEMS Microbiological Ecology* 54:157-165.
- Lennon, J.T., V. Smith, A. Dzialowski. 2003. Invasibility of plankton food webs along a trophic state gradient. *Oikos* 102:191-203.
- Ensz, A.P., C.W. Knapp, and D.W. Graham. 2003. Influence of autochthonous dissolved organic carbon and nutrient limitation on alachlor biotransformation in aerobic aquatic systems. *Environmental Science and Technology* 37:4157-4162.

PAPERS PUBLISHED (some published abstracts and technical reports included as noted):

- deNoyelles, F., Jr. 1967. Factors affecting phytoplankton distribution in a double-cell sewage lagoon. *Journal of Phycology* 4:188-194.
- deNoyelles, F., Jr. 1968. A stained-organism filter technique for concentrating phytoplankton. *Limnology and Oceanography* 13:562-565.
- O'Brien, W.J. and F. deNoyelles, Jr. 1972. Photosynthetically elevated pH as a factor in zooplankton mortality in nutrient enriched ponds. *Ecology* 53:605-614.
- Barlow, J.P., W.R. Schaffner, F. deNoyelles, Jr. and B.J. Peterson. 1973. Continuous flow nutrient bioassays with natural phytoplankton populations. p. 299-319 in *Bioassay Techniques and Environmental Chemistry*, Ann Arbor Science Publishers, Ann Arbor, MI.
- O'Brien, W.J. and F. deNoyelles, Jr. 1974. Filtering rate of *Ceriodaphnia reticulata* in pond waters of varying phytoplankton concentrations. *American Midland Naturalist* 91:509-512.
- deNoyelles, F., Jr. and W.J. O'Brien. 1974. The in situ chemostat---a self-contained continuous culturing and water sampling system. *Limnology and Oceanography* 19:326-331.
- O'Brien W.J. and F. deNoyelles, Jr. 1974. Relationship between nutrient concentration, phytoplankton density, and zooplankton density in nutrient enriched experimental ponds. *Hydrobiologia*. 44:91-104.
- O'Brien, W.J., D.G. Huggins and F. deNoyelles, Jr. 1975. Primary productivity and nutrient limiting factors in lakes and ponds of the Noatak River Valley, Alaska. *Archiv für Hydrobiologie* 75:263-275.
- deNoyelles, F., Jr. 1976. In situ chemostat studies of environmental factors affecting phytoplankton succession during eutrophication. *Journal of Phycology* 12 suppl., 10 (abst).
- O'Brien, W.J. and F. deNoyelles, Jr. 1976. Response of three phytoplankton bioassay techniques in experimental ponds of known limiting nutrient. *Hydrobiologia* 49:65-76.
- Reinke, D.C. and F. deNoyelles, Jr. 1977. Field evaluation of a lake in situ continuous culture device. *Journal of Phycology* 13 suppl., 57 (abst).
- deNoyelles, F., Jr. and W.J. O'Brien. 1978. Phytoplankton succession in nutrient enriched experimental ponds as related to changing carbon, nitrogen and phosphorus conditions. *Archiv für Hydrobiologie* 84:137-165.
- Reinke, D.C. and F. deNoyelles, Jr. 1979. The effect of cadmium on primary production of

- natural phytoplankton communities with varying light intensities and exposure times. *Journal of Phycology* 15 suppl., 22 (abst).
- deNoyelles, F., Jr., D. Reinke, R. Knoechel, D. Treanor and C. Altenhofen. 1980. Continuous culturing of natural phytoplankton communities in the Experimental Lakes Area---effects of enclosure, in situ incubation, light, phosphorus and cadmium. *Canadian Journal of Fisheries and Aquatic Science* 37:424-433.
- Knoechel, R. and F. deNoyelles, Jr. 1980. An analysis of the response of hypolimnetic phytoplankton in continuous culture to increased light or phosphorus using track autoradiography. *Canadian Journal of Fisheries and Aquatic Science* 37:434-441.
- deNoyelles, F., Jr., D. Reinke, D. Treanor and C. Altenhofen. 1980. In situ continuous culturing of lake phytoplankton communities. p. 489-512 in J. P. Giesey, Jr. (ed.), *Microcosms in Ecological Research*, SREL, Savannah, Georgia.
- Reinke, D.C. and F. deNoyelles, Jr. 1980. Unialgal bioassays as predictive models in algal ecology. *Journal of Phycology* 16 suppl., 34.
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