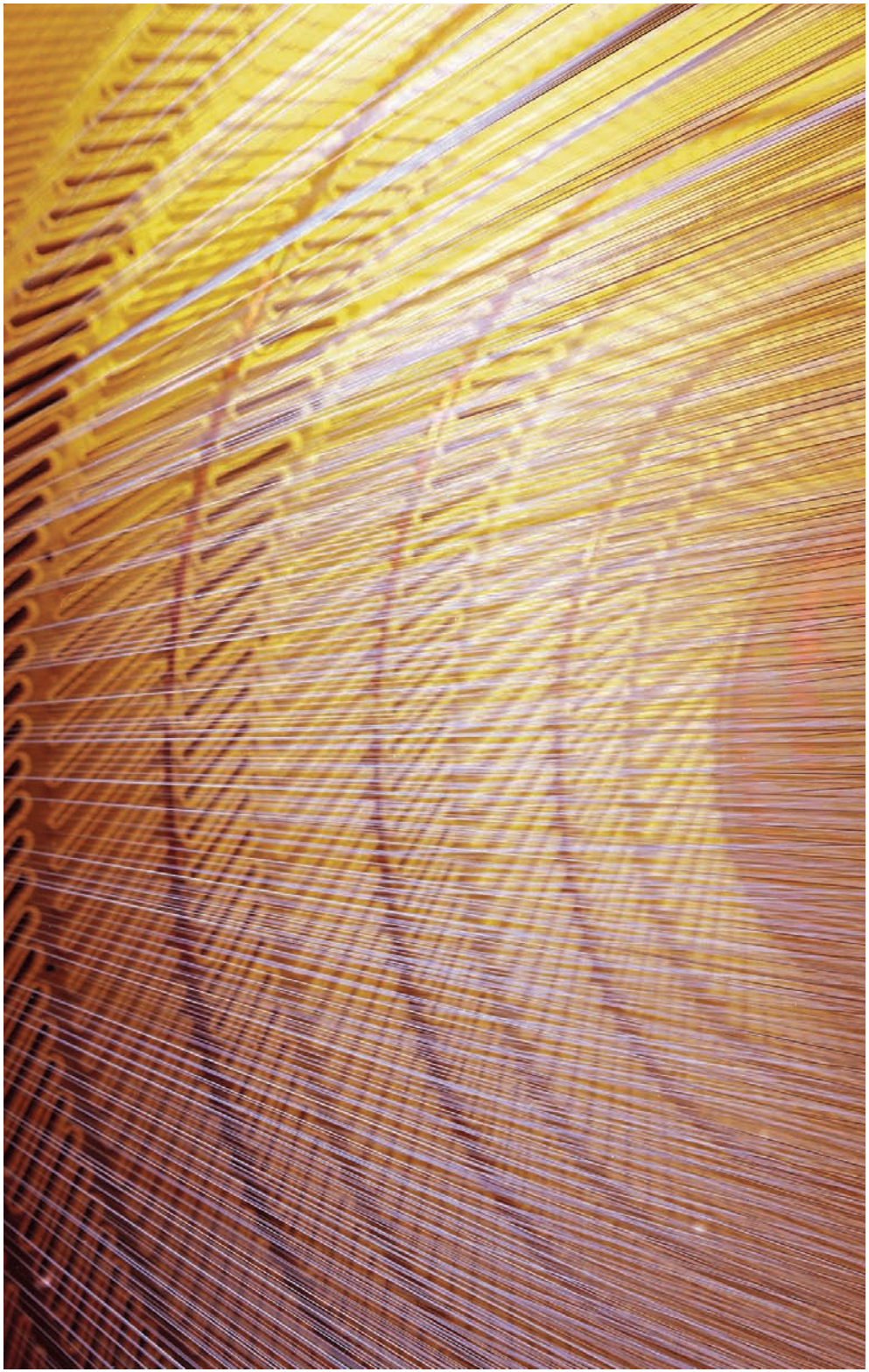

PRAIRIE
RESEARCH INSTITUTE

PRAIRIE LIGHTNING SYMPOSIUM

50 Talks **27** Posters

November 16
9:00–4:00 Talks
4:00–5:00 Posters
4:00–6:00 All staff reception with entertainment by Big Bluestem

November 17
12:30–1:00 Refreshments
1:00–4:00 Talks

I Hotel and Conference Center
Chancellor Ballroom

Join Survey colleagues to share our work
and explore new collaboration possibilities
in a fun, fast-paced setting.

Prairie Lightning Symposium
November 16-17, 2011

Chancellor Ballroom
I Hotel and Conference Center
Champaign, Illinois

ILLINOIS

AGENDA

Wednesday, November 16

8:30 a.m.	Continental breakfast
9:00 a.m.	Introduction and ground rules
9:05 a.m.	Welcome
9:15 a.m.	Session 1-A
10:00 a.m.	Break
10:15 a.m.	Session 1-B
11:00 a.m.	Break
11:15 a.m.	Session 1-C
11:45 a.m. to 1:15 p.m.	Lunch on your own
1:15 p.m.	Session 2-A
2:00 p.m.	Break
2:15 p.m.	Session 2-B
3:00 p.m.	Break
3:15 p.m.	Session 2-C

All Staff Reception and Poster Session

4 p.m. to 5 p.m.	Poster session
4 p.m. to 6 p.m.	All staff reception. Music by Big Bluestem String Band at 4:30 p.m.

Thursday, November 17

12:30 p.m.	Refreshments
1:00 p.m.	Introduction and ground rules
1:05 p.m.	Welcome
1:15 p.m.	Session 3-A
2:00 p.m.	Break
2:15 p.m.	Session 3-B
3:00 p.m.	Break
3:15 p.m.	Session 3-C
4:00 p.m.	Discussion and closing remarks

EXPANDED AGENDA

Wednesday, November 16

8:30 a.m. **Continental breakfast**
9:00 a.m. **Introduction and ground rules**
9:05 a.m. **Welcome – Bill Shilts**

9:15 a.m. **Session 1-A**

Sarah Wisseman	ISAS	*Medical Imaging and DNA Studies of the Spurlock Museum's Egyptian Mummy*
Steve Brown	ISGS	*Glacial Geology and History of Lake County, Illinois*
Jim Angel	ISWS	*2011 Flash Drought*
Dan Marsch	ISTC	*Illinois Conservation of Resources and Energy (ICORE) Project*
Glenn Heistand	ISWS	*Coordinated Hazard Assessment and Mapping Program (CHAMP) H&H Modeling*
Steve Taylor	INHS	*Cave Life: Fragile Ecosystems Sensitive to Change*

10:00 a.m. **Break**

10:15 a.m. **Session 1-B**

Al Wehrmann	ISWS	*Is Chicagoland Running Out of Water?*
Brad Koldehoff	OED	*Tracking Illinois' First Pioneers*
Junhau Jiang	ISTC	*Ammonia Economy: Opportunities and Challenges*
Bill White	ISWS	*Targeting In-Stream Restoration and Naturalization Needs*
Renaé Strawbridge	ISGS	*Asset Management Do's and Don't's*
Tari Tweddale	INHS	*Illinois Natural Areas Inventory Update Project*

11:00 a.m. **Break**

11:15 a.m. **Session 1-C**

Brandon Curry	ISGS	*Ice and Speed*
Alena Bartosova	ISWS	*Beyond Water Quality Simulation...*
Gary Miller	OED	*Greening Universities in Illinois*
Todd Rusk	ISTC	*Illinois Groundwater Source Geothermal Resource Mapping*

11:45 a.m. to 1:15 p.m. **Lunch on your own**

1:15 p.m. **Session 2-A**

Andrew Fortier	ISAS	*Analysis of Prehistoric Dog Coprolites from the Janey B. Goode Site*
Momcilo Markus	ISWS	*Hydrologic Predictions*
Barb Stiff	ISGS	*Visualizing an Aquifer*
Wei Zheng	ISTC	*Pharmaceutical and Personal Care Products in Reused Water and Biochar in Bioenergy*
Molly Woloszyn	ISWS	*The Midwestern Regional Climate Center*

2:00 p.m. **Break**

2:15 p.m. **Session 2-B**

George Roadcap	ISWS	*The Mahomet Aquifer: How Naturally Increasing Recharge Rates are Balancing the Growth in Water Demand*
Yaghoob Lasemi	ISGS	*The Occurrence and Distribution of the Silurian Petroleum Reservoirs of the Mt. Auburn Trend in Macon and Christian Counties, Central Illinois*
Kishore Rajagopalan	ISTC	*Forward Osmosis – An Emerging Desalination Technique*
Tom Holm	ISWS	*PAHs and Biochar: Sorption and Bioavailability*
Laura Kozuch	ISAS	*Up From Florida: Shark Teeth and Shells at Illinois Archaeological Sites*
Tim Larson	ISGS	*Why I Can't Resist Resistivity*

3:00 p.m. **Break**

3:15 p.m. **Session 2-C**

Drew Phillips	ISGS	*A River, A Story*
Steve Wilson	ISWS	*SmallWaterSupply.org – Free Online Resources and Support for Water and Wastewater Operators*
Jennifer Deluhery	ISTC	*Reducing Water Use on Campus: Cooling Towers*
Melony Barrett	ISGS	*Introducing the New Illinois Oil and Gas Resources Web Mapping Application*
Jennie Atkins	ISWS	*Water and Atmospheric Resources Monitoring (WARM) Program*

All Staff Reception and Poster Session

4 p.m. to 5 p.m. **Poster session**
4 p.m. to 6 p.m. **All staff reception. Music by Big Bluestem String Band at 4:30 p.m.**

Thursday, November 17

12:30 p.m. **Refreshments**
1:00 p.m. **Introduction and ground rules**
1:05 p.m. **Welcome – Bill Shilts**

1:15 p.m. **Session 3-A**

David Enstrom	INHS	*Remote Monitoring of Individual Birds during Migration: An Overview*
Nancy Westcott	ISWS	*A 19th Century Weather Dataset for Use in Historical Studies*
Deette Lund	ISGS	*Old Yet New Again – Historic Aerial Photographs of Illinois*
John Scott	ISTC	*Analysis of Complex Materials Generated from Thermochemical Conversion*
Yu-Feng Lin	ISWS	*The ubiquitous WebGIS Analysis Toolkit for Extensive Resources (uWATER)*
Bill Shilts	OED	*Permafrost and Patterned Ground, Arctic Canada*

2:00 p.m. **Break**

2:15 p.m. **Session 3-B**

George Czapar	ISWS	*Agriculture and Water Quality*
William Roy	ISGS	*Geochemical Sequestration of Carbon Dioxide*
Joe Pickowitz	ISTC	*Growing* Jatropha curcas *for Renewable Energy in Haiti*
Susan Braxton	OED	*Issues in Data Management and Curation*
Lisa Graff	ISWS	*Discovery to Increase Flood Risk Awareness and Capabilities*
B.K. Sharma	ISTC	*Thermo-Chemical Conversion of Renewable or Waste Biomass/Material to Bio-Oils*

3:00 p.m. **Break**

3:15 p.m. **Session 3-C**

Jeffrey Matthews	INHS	*Constraints on Restoration Progress in Compensatory Mitigation Wetlands*
Jason Thomason	ISGS	*3D Geologic Mapping for Water Resources in McHenry County, Illinois*
David Kristovich	ISWS	*Lake-effect Snow Storm Research Heats Up*
Eve Hargrave	ISAS	*The Meaning of Bones*
Leslie Stoecker	ISWS	*Meteorological Causes of the Long-term Variations in Observed Extreme Rainfall Events*

4:00 p.m. - 4:15 pm **Discussion and closing remarks**

LIGHTNING TALK ABSTRACTS

Jim Angel, State Climatologist, ISWS. jimangel@illinois.edu. Session 1-A.
2011 Flash Drought
Droughts in Illinois generally evolve slowly over time and require several months of deficient precipitation. However, in the summer of 2011 we experienced a flash drought in central Illinois where the combination of very large precipitation deficits and high temperatures caused significant damage to crops in two months. I will discuss the interesting features of this flash drought.

Jennie Atkins, WARM Program Manager, ISWS. jatkins@illinois.edu. Session 2-C.
Water and Atmospheric Resources Monitoring (WARM) Program
ISWS's Water and Atmospheric Resources Monitoring (WARM) Program brings together weather, surface water, and groundwater monitoring networks to provide comprehensive information on water within the state. Its soil moisture, instream sediment, and other data are utilized by academia, government, and the agricultural community for planning and research. The program is searching for relationships and opportunities to make further use of the information.

Melony Barrett, GIS Specialist, ISGS. mebarret@illinois.edu. Session 2-C.
Introducing the New Illinois Oil and Gas Resources Web Mapping Application
The Illinois State Geological Survey has been providing on-line access to its large petroleum database of over 180,000 Illinois well records via web map for many years now. In this presentation, an updated interface and exciting new selection and navigation tools will be highlighted.

Alena Bartosova, Environmental Engineer, ISWS. alena@illinois.edu. Session 1-C.
Beyond Water Quality Simulation ...
Navigating the worlds of regulations, stakeholders, and science can be challenging without a comprehensive approach and adequate monitoring data. Several examples of blending water quality modeling with statistical approaches to satisfy regulatory requirements will be presented. Costly water quality monitoring can be avoided by focusing its design.

Susan Braxton, Institute Head Librarian, OED. braxton@illinois.edu. Session 3-B.
Issues in Data Management and Curation
Funding agencies are placing new obligations on researchers for data management planning. At issue are both timely access and long-term preservation. Tools currently available and those under development as part of the Illinois Research Data Initiative will be discussed.

Steve Brown, Senior Geologist, ISGS. steebrow@illinois.edu. Session 1-A.
Glacial Geology and History of Lake County, Illinois
The last glacier that occupied northeast Illinois shared space with large glacial lakes, which were ancestral versions of Lake Michigan. The lakes influence both sedimentary processes as well as the movement of the glacier, as its ice-margin advanced and retreated in and out of the area. This talk will demonstrate the evolution of the glacial geology in Lake County through a series of schematic maps and cross sections that illustrate the advance and retreat of the ice-margin, the accumulation of the glacial deposits, and the development of the glacial landscape.

Brandon Curry, Senior Geologist, ISGS. b-curry@ illinois.edu. Session 1-C.
Ice and Speed
Radiocarbon dating of tundra plant fossils archived in sediments in dead-ice permafrost provide bounding ages of ice margins and proglacial lakes from the last deglaciation. The distribution of dated successions provides limits on how fast the ancient ice moved and when large volumes of meltwater were routed to the Gulf of Mexico.

George Czapar, Director, Center for Watershed Science, ISWS. gfc@illinois.edu. Session 3-B.
Agriculture and Water Quality
With almost 27 million acres of farmland in Illinois, agriculture has a significant effect on water resources. Strategies for improving water quality range from voluntary approaches to increased regulation. Presentation will describe collaborative projects to reduce the impacts of agriculture on water quality that include research, teaching, and outreach components.

Jennifer Deluhery, Chemist, ISTC. deluhery@istc.illinois.edu. Session 2-C.
Reducing Water Use on Campus: Cooling Towers
When the University of Illinois at Urbana-Champaign signed on to the American College & University Presidents' Climate Commitment in 2008, one of the targeted goals was to reduce potable water consumption on campus 20% by 2015 and 40% by 2025. Cooling towers utilize over 20% of the total campus water. A greater understanding of how water is used at these locations and the quantity opens opportunities for increased operating efficiency and water savings.

David Enstrom, Research Scientist, INHS. denstrom@illinois.edu. Session 3-A.
Remote Monitoring of Individual Birds during Migration: An Overview
Radio telemetry of migrating birds was pioneered at INHS by William Cochran. With Bill, I and others at the Institute are continuing this tradition with the species he devoted much of his later career to, the Swainson's Thrush. I will outline the general method, previous research and current projects probing the behavior of birds moving through the night sky.

Andrew Fortier, Associate Director of Special Projects and Research, ISAS. fortier@illinois.edu. Session 2-A.
Analysis of Prehistoric Dog Coprolites from the Janey B. Goode Site
Analysis of a sample of prehistoric dog coprolites from a Midwest archaeological site, Janey B. Goode, dating to A.D. 900 has produced spectacular results. Thus far, we have identified a variety of macro-fauna, including undigested fish, bird, amphibian and small mammal parts, dog hair and plant fiber, and bacterial DNA. We hope to learn about the health and nutritional levels of a specific dog population, and will in the future conduct blood panelling and parasite identification to that effect.

Lisa Graff, GIS Team Manager, ISWS. lgraff@illinois.edu. Session 3-B.
Discovery to Increase Flood Risk Awareness and Capabilities
The Discovery Process is the initiation of FEMA's new Risk Mapping, Assessment, and Planning (Risk MAP) program, designed to provide communities with flood information and tools that can be used to better protect citizens. The Coordinated Hazard Assessment and Mapping Program (CHAMP) at the Illinois State Water Survey is working in partnership with FEMA to conduct Discovery across Illinois. Discovery is about finding project partners, engaging local stakeholders, and collecting data related to flood risk to gain a better understanding of the flood risk and flood mitigation capabilities within a watershed.

Eve Hargrave, Lab Coordinator/Physical Anthropologist, ISAS. ehargrav@illinois.edu. Session 3-C.
The Meaning of Bones
Perceptions of human remains vary across cultures and through time. Recent research on this topic focuses on the distribution of culturally modified human remains throughout the Midwest and how archaeological context provides insights into the changing significance of human remains in prehistory.

Glenn Heistand, Senior Hydraulic Engineer, ISWS. heistand@illinois.edu. Session 1-A.
Coordinated Hazard Assessment and Mapping Program (CHAMP) H&H Modeling
The CHAMP group is a Cooperating Technical Partner (CTP) with the Federal Emergency Managment Agency (FEMA) and has been working with FEMA on floodplain mapping and modeling projects since 2004. We produce FEMA's Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies (FIS) for the State of Illinois, including a portion of the supporting hydrologic and hydraulic analyses.

Tom Holm, Groundwater Geochemist, ISWS. trholm@illinois.edu. Session 2-B.
PAHs and Biochar: Sorption and Bioavailability
Biochar is known to improve soil fertility, but it contains carcinogenic polycyclic aromatic hydrocarbons (PAHs). However, biochar sorbs PAHs and this may limit PAH bioavailibility.

Junhua Jiang, Senior Research Engineer, ISTC. jjiang@istc.illinois.edu. Session 1-B.
Ammonia Economy: Opportunities and Challenges
Ammonia economy based on the use of ammonia as a fuel has great potential to address the concerns with global warming and our dependence on fossil fuels since ammonia is a zero-carbon fuel with high energy density. It possesses obvious advantages over the hydrogen economy in terms of the fuel production, storage and transportation using existing infrastructures. Our research efforts currently conducted at the ISTC include (1) novel processes for the production of renewable ammonia; (2) development of high performance ammonia fuel cells and (3) control and utilization of emissions from ammonia combustion.

Brad Koldehoff, Cultural Resources Coordinator, OED. koldehof@illinois.edu. Session 1-B.
Tracking Illinois' First Pioneers
Illinois at the close of the last Ice Age was settled by small bands of hunters. Their movements across Illinois can be tracked by identifying the raw materials from which they manufactured their stone spear points and other tools. Patterns of raw material use indicate these pioneering groups were highly mobile, substantially more mobile than subsequent early Holocene groups.

Laura Kozuch, Curator, ISAS. shellwoman1@illinois.edu. Session 2-B.
Up From Florida: Shark Teeth and Shells at Illinois Archaeological Sites
After about 500 AD marine shells are commonly found in ceremonial contexts in Illinois. Shark teeth are rare, but are found. Alligator teeth are very rare. This indicates knowledge and sporadic contact with folks living near the Gulf of Mexico.

David Kristovich, Head, Center for Atmospheric Sciences, ISWS. dkristo@illinois.edu. Session 3-C.
Lake-effect Snow Storm Research Heats Up
The Great Lakes have large influences on rain and snow systems, impacting communities throughout the region. The Mesoscale/Boundary Layer Meteorology group examines the physical processes governing the influence of the Great Lakes on both warm-season and cold-season precipitation. This presentation will discuss recent findings about lake-effect snow

storms, including microphysical snow growth processes and an unexpected reversal in climatic trends of snowfall near Lake Michigan.

Tim Larson, Senior Geophysicist, ISGS. thlarson@ illinois.edu. Session 2-B.
Why I Can't Resist Resistivity
Electrical earth resistivity measurements have been the 'bread and butter' of the ISGS geophysics program for over 70 years. Today we use it for water resource, contaminant transport and geologic mapping projects. The method has many other potential uses including as a proxy for hydraulic property analysis.

Yaghoob Lasemi, Sedimentologist/Reservoir Geologist, ISGS. ylasemi@illinois.edu. Session 2-B.
The Occurrence and Distribution of the Silurian Petroleum Reservoirs of the Mt. Auburn Trend in Macon and Christian Counties, Central Illinois
Several lenticular carbonate petroleum reservoirs occur in the upper part of the Middle Silurian Racine Formation in the Decatur-Mt. Auburn area, central Illinois. These reservoirs are generally interlayered with laterally extensive, impermeable limestone beds displaying cyclic reservoir-non-reservoir packages. They formed during sea level highstand and constitute the upper part of small-scale shallowing-upward cycles.

Yu-Feng (Forrest) Lin, Hydrogeologist, ISWS. yflin@illinois.edu. Session 3-A.
The ubiquitous WebGIS Analysis Toolkit for Extensive Resources (uWATER)
One of the major challenges in scientific research is expressing complex scientific/technical concepts in easily understood terms so the concepts can more readily be used by policy makers and stakeholders to assess data and theoretical conclusions. We present two GIS plug-ins that aid in visualizing alternative approaches for natural resource management in intuitive and simple approaches: (1) the ubiquitous WebGIS Analysis Toolkit for Extensive Resources (uWATER) and (2) its extension, the uWATER-Pumping Assessment (uWATER-PA) program, both of which can be downloaded at http://www.isws.illinois.edu/gws/sware/ and which include a user's manual and example files. With this free GIS-based decision support system (DSS), nonspecialists can consider the results of technical modeling, along with societal values, when making decisions that affect sustainable resource management.

Deette Lund, Image Processing Analyst, ISGS. dlund@illinois.edu. Session 3-A.
Old Yet New Again – Historic Aerial Photographs of Illinois
Illinois historic aerial photographs (1938 to 1941) are finally available for the entire state. A new, easier to use, interactive map has been developed to access the photos in multiple file formats. Compressed images are available in Jpeg and MrSid formats and uncompressed images are accessible in Tiff format.

Momcilo Markus, Hydrogeologist, ISWS. mmarkus@illinois.edu. Session 2-A.
Hydrologic Predictions
Prediction of the future states of the complex and changing hydroclimatic system is extremely challenging due to the presence of numerous uncertainties. Prediction lead times could be several hours or several days for peak river discharges or pollutant concentration, several months for reservoir inflows, and much longer for future climate scenarios, where the typical prediction horizons are 2050 and 2100. Selected statistical techniques applied to a range of prediction problems are illustrated through examples.

Dan Marsch, Process Engineer, ISTC. dmarsch@istc.illinois.edu. Session 1-A.
Illinois Conservation of Resources and Energy (ICORE) Project
The Illinois Conservation of Resources and Energy (ICORE) project strives to achieve energy and water conservation improvements in Illinois businesses and communities. Through the project, the Illinois Sustainable Technology Center (ISTC) provides technical assistance to water and wastewater treatment facilities and businesses to improve efficiency in: 1) water consumption; 2) wastewater generation; 3) energy consumption; and 4) carbon emissions.

Jeffrey Matthews, Wetland Plant Ecologist, INHS. jmatthew@inhs.illinois.edu. Session 3-C.
Constraints on Restoration Rrogress in Compensatory Mitigation Wetlands
The botanists, soil scientists and GIS specialists of the INHS Wetland Science Program monitor compensatory mitigation wetlands for the Illinois Department of Transportation. Monitoring data collected from these wetlands indicate that restoration progress can be constrained by landscape context, disturbance events and non-native species invasion. These findings have implications for wetland mitigation policies.

Gary Miller, Associate Executive Director, OED. gdmiller@illinois.edu. Session 1-C.
Greening Universities in Illinois
For the past three years I have been serving as Co-Chair of the Green Universities and Colleges Subcommittee for the Office of the Governor and representing the University of Illinois on the Green Government Coordinating Council. The goal is to foster networking and best sustainable practices in campus operations, facilities and curriculum. I will describe this program and opportunities for leveraging of interest to the Institute.

Drew Phillips, Associate Quaternary Geologist, ISGS. aphillips@illinois.edu. Session 2-C.
A River, A Story
The geology of the lower Wabash River valley has been largely forgotten over the years, in part because there are few people, it's a long way from there to here, and it flows contrary to the flow of modern commerce. But the river is at the dynamic intersection of geologic process through three glaciations, a possible failed rift, resource extraction, and modern meandering along the longest unmanaged stream in the Midwest. This intersection motivates a new initiative to develop a modern geologic framework and to take a new look at an old river.

Joe Pickowitz, Environmental Engineer, ISTC. joep@istc.illinois.edu. Session 3-B.
Growing Jatropha curcas *for Renewable Energy in Haiti*
The talk will discuss setting up Haiti's first biodiesel pilot plant and expelling oil from *Jatropha* seeds to make Haiti's first biofuel.

Kishore Rajagopalan, Associate Director, ISTC. kishore@istc.illinois.edu. Session 2-B.
Forward Osmosis – An Emerging Desalination Technique
Forward osmosis is an emerging desalination technique. The talk will introduce the underlying concepts, current challenges, and ongoing work at ISTC in this area.

George Roadcap, Hydrogeologist, ISWS. roadcap@illinois.edu. Session 2-B.
The Mahomet Aquifer: How Naturally Increasing Recharge Rates are Balancing the Growth in Water Demand
Model simulations of the dramatic growth in pumpage from the Mahomet Aquifer since the 1940s show that recharge rates have increased over time. By increasing the modeled recharge rates in the areas where the aquifers outcrop, we were able to match the 60-year water level

records from observation wells in Snicarte and Champaign. Recent data from new wells also suggest that most of the increased recharge is occurring during flooding events.

William Roy, Senior Geochemist, ISGS. wroy@illinois.edu. Session 3-B.
Geochemical Sequestration of Carbon Dioxide
With funding from the US EPA and DOE, geochemical sequestration of carbon dioxide at the Illinois Basin-Decatur project is being investigated under laboratory conditions, coupled with geochemical modeling. Core samples are being placed in pressure vessels, then pressurized with super-critical CO_2. A variety of techniques such as SEM-EDX are being used to characterize the reaction products for comparisons with model-predicted solid phases.

Todd Rusk, Interim Coordinator, Emerging Technologies and Assistance Program, ISTC. toddr@istc.illinois.edu. Session 1-C.
Illinois Groundwater Source Geothermal Resource Mapping
The use of groundwater can greatly enhance the performance, efficiency, and cost-effectiveness of geothermal heat pumps for heating and cooling applications. This work will create maps that identify the geographic locations and quantify the thermal energy resource potential for utilization of groundwater source geothermal heat pumps. This is a collaborative effort between ISTC, ISWS, and ISGS.

John W Scott, Senior Analytical Chemist, ISTC. jscott@istc.illinois.edu. Session 3-A.
Analysis of Complex Materials Generated from Thermochemical Conversion
Hydrothermal liquefaction and pyrolysis are emerging technologies that create bio-products from biomass feedstocks. To date, few studies have characterized the aqueous phase generated by these processes. The use of high resolution GC-MS for characterization of this phase will be highlighted.

B.K. Sharma, Senior Research Scientist, ISTC. bsharma@istc.illinois.edu. Session 3-B.
Thermo-Chemical Conversion of Renewable or Waste Biomass/Material to Bio-Oils
Energy production from renewable or waste biomass/material is a more attractive alternative compared to conventional feedstocks, such as corn and soybean. Our work involves total utilization of renewable material (algae) and waste material, such as spent coffee ground and soapstock, through a two-step process. First step is removal of oil (fatty material) that can be converted to biodiesel, while the second step involves conversion of remaining defatted material and other waste fatty material (soapstock) into bio-oil using pyrolysis and hydrothermal liquefaction. These bio-oils are then characterized using various analytical techniques to explain the influence of feedstocks and processes on bio-oil yields and composition.

Bill Shilts, Executive Director, OED. shilts@illinois.edu. Session 3-A.
Permafrost and Patterned Ground, Arctic Canada
North of 60^{o} latitude west of Hudson Bay, permafrost is over 330 meters thick, and only the upper 50 cm - 1.5 m of the unconsolidated sediment surface thaws each summer. Various processes cause this surface to be ornamented with distinct geometrical patterns*, patterned ground*, that are reflective of the physical nature of the sediments and soils that form the tundra surface. While one- to two-meter diameter circular patterns that result from soft-sediment deformation form nets on surfaces underlain by poorly sorted till and water lain muds, polygonal patterns form preferentially on non-deformable sediments, such as ice-contact

gravels, isostatically raised beaches, eskers, and poorly drained areas underlain by peaty organic mats.

Barb Stiff, Associate Geomorphologist, ISGS. b-stiff@illinois.edu. Session 2-A.
Visualizing an Aquifer
Geo-scientists proposed the construction of an "actual" 3-dimensional model of glacial materials deposited in a buried bedrock valley to demonstrate the areal extent of the Mahomet aquifer. Methods used to build a model of the bedrock valley once occupied by the ancient Mississippi River were used to construct the aquifer model. Many features such as elevation change, material sequence and distribution, hydrologic properties and water well or borehole data may be incorporated in these models and their virtual derivatives for analytical and educational applications.

Leslie Stoecker, Assistant Research Climatologist, ISWS. lensor@illinois.edu. Session 3-C.
Meteorological Causes of the Long-term Variations in Observed Extreme Rainfall Events
Daily extreme precipitation events at 935 cooperative observer stations across the conterminous United States during 1908 - 2009 were identified and assigned to a meteorological cause. The events were categorized as extratropical cyclone near a front, extratropical cyclone near center of low pressure, tropical cyclone, mesoscale convective system, air mass convection, North American Monsoon, or upslope flow. Extreme precipitation events were found to increase during the warm season, but when assigned to a cause, only the extreme events associated with fronts and tropical cyclones exhibited an upward trend over the 102 year period.

Renaé Strawbridge, Program Admin Assistant, ISGS. rstrawbr@illinois.edu. Session 1-B.
Asset Management Do's and Don't's
Renaé Strawbridge provides inventory control for three of the five Prairie Research Institute Divisions – Geological Survey, Natural History Survey, and Sustainable Technology. This presentation will provide several helpful tips to painlessly improve and maintain asset management within U of I policies.

Steve Taylor, Macroinvertebrate Biologist, INHS. sjtaylor@illinois.edu. Session 1-A.
Cave Life: Fragile Ecosystems Sensitive to Change
Cave ecosystems include many organisms adapted to stable conditions in unique subterranean environments. Yet the lives of these organisms are closely tied to above ground ecosystems as a source for energy, and thus they are affected by environmental perturbations. Examples of the sensitive nature of this connectivity will be presented.

Jason Thomason, Associate Hydrogeologist Mapper, ISGS. ithomaso@ illinois.edu. Session 3-C.
3D Geologic Mapping for Water Resources in McHenry County, Illinois
Given the increasing stresses on water resources in McHenry County, IL, a 3D geologic model of the glacial aquifer system(s) is being developed throughout the county. This project has incorporated an intensive field data acquisition program coupled with a variety of 3D visualization and analysis software tools. Results of this project are being incorporated into groundwater flow modeling efforts, and final map products will address other specific needs of county decision makers.

Tari Tweddale, GIS Coordinator, INHS. tweicher@illinois.edu. Session 1-B.
Illinois Natural Areas Inventory Update Project

The Illinois Natural Areas Inventory (INAI) provides a set of information about high quality natural areas, habitats of endangered species, and other significant natural features. Information from the INAI is used to guide and support land acquisition and protection programs by all levels of government as well as by private landowners and conservation organizations. In 2007 - 2011, a statewide update of the INAI is being conducted with the goal of developing a list of high quality grasslands, woodlands, and wetlands, based on the current condition of Illinois landscapes using the latest scientific knowledge and technology. An overview and status of this project to date will be presented.

Allen Wehrmann, Head, Ctr. for Groundwater Science, ISWS. alex@illinois.edu. Session 1-B.
Is Chicagoland Running Out of Water?
The 11-county northeastern Illinois region uses approximately 1.5 billion gallons of water per day; by 2050, that could reach to 1.6 to 2.4 bgd. Where will that water come from and what will be the impacts on northeastern Illinois' surface water and groundwater resources?

Nancy Westcott, Research Climatologist/Meteorologist, ISWS. nan@illinois.edu. Session 3-A.
A 19th Century Weather Dataset for Use in Historical Studies
19th and 20th century weather data are available to examine severe weather events (blizzards, floods, heat waves, wind, hail, dense fog) and their impact on human health and well-being, agriculture, water resources, transportation, population migration, and historical events. Specific examples of extreme events, their historical context and their impact are presented.

Bill White, Geomorphologist, ISWS. bwhite1@illinois.edu. Session 1-B.
Targeting In-Stream Restoration and Naturalization Needs
Geomorphic response to both intrinsic and extrinsic stimuli can be complex and create difficulties for land managers, natural resource professionals and other decision makers. Many small but *high gradient* watershed streams drain bluffs along major river valleys in Illinois and in so doing discharge disproportionate amounts of sediment and other pollutant loadings to our large river systems. Today's presentation includes a brief discussion about the occurrence and impact of these small, but unstable tributary channels and why there is a need to more formally and programmatically address these geomorphological “zones”. We will conclude with an equally brief discussion on how geomorphologists currently characterize streams and prioritize them as targets for synchronized channel segment and overall system restoration and naturalization.

Steve Wilson, Hydrologist, ISWS. sdwilson@illinois.edu. Session 2-C.
SmallWaterSupply.org – Free Online Resources and Support for Water and Wastewater Operators
SmallWaterSupply.org is a website for small system drinking water and wastewater operators that has searchable content and a national listing of operator training opportunities. It uses an innovative search and maintenance strategy to stay current and relevant. It includes a newsletter, blog, and forum, as well as the latest social media applications.

Sarah Wisseman, Director, Program on Ancient Tech. and Archaeological Materials, ISAS. wisarc@illinois.edu. Session 1-A.
Medical Imaging and DNA Studies of the Spurlock Museum's Egyptian Mummy
Twenty years after the first interdisciplinary study, ISAS and the Spurlock Museum have collaborated with Carle Clinic and Anthropology to conduct new imaging and DNA analyses of the University of Illinois' only human Egyptian mummy. The new research takes advantage of much higher resolution CT scanning and advances in DNA technology since 1990. Results confirm that the Roman period mummy is a child from a wealthy family who suffered massive head trauma.

Molly Woloszyn, Extension Climatologist, ISWS. mollyw@illinois.edu. Session 2-A.
The Midwestern Regional Climate Center
In its 23 years at the Water Survey, the Midwestern Regional Climate Center (MRCC) has monitored the climate of the Midwest and provided users and decision-makers with climate data and information for the nine-state region. We have the expertise to provide climate data from a variety of sources and to develop practical applications of climate information on issues ranging from agriculture to risk management to water resources. Our applied research helps explain the climate of the region and its impacts on the Midwest.

Wei Zheng, Senior Research Scientist, ISTC. wzheng@istc.illinois.edu. Session 2-A.
Pharmaceutical and Personal Care Products in Reused Water and Biochar in Bioenergy
The presentation will talk about the potential environmental risk related to wastewater reuse, primarily focusing on the emerging contaminants including pharmaceuticals and personal care products (PPCPs). Biochar produced from bioenergy will also be discussed for its carbon sequestration, soil amendment, and water treatment.

POSTER PRESENTERS AND TITLES

Kendall Annetti, Nohra E. Mateus-Pinilla, Laura Kohrt, and Shannon L. Fredebaugh, IHNS. nohram@illinois.edu. [1]
Survey of Hemoparasites in Illinois Game Birds and Waterfowl

Marilyn Beckman, Sam Heads, Ed DeWalt, David Eades, Rich Flood, James Tucker, Mike Maehr, and Lesley Deem, INHS. mbeckman@illinois.edu. [4]
Building Tools to Store and Share Animal Nomenclatural Information: Species File Software Development at the INHS

Samantha K. Carpenter, Nohra E. Mateus-Pinilla, Nelda A. Rivera, Shannon L. Fredebaugh, Kuldeep Singh, Andreas Lehner, Wilson Rumbeiha, and Damian Satterthwaite-Phillips, IHNS. nohram@illinois.edu. [9]
Assessment of Environmental Contaminants in River Otters from Illinois 2009 - 2010

Katherine Chi, Michelle L. Collins, Dalya Abou-El-Seoud, and Brenda Molano-Flores, INHS. fmolano@illinois.edu. [11]
Shading Effects on Reproductive Ecology of Besseya bullii*, a Rare Species*

Sergiusz Czesny, Jacques Rinchard, and Dale Hanson, INHS. czesny@illinois.edu. [18]
Fatty Acid Signature (FAS) Analysis is a Useful Tool in Food Web Studies

D.A. Dmitriev and C.H. Dietrich, INHS. dmitriev@inhs.illinois.edu. [22]
Cybertaxonomic Approach to Revision of Larger Groups: 3i Experience

Kenneth Farnsworth, ISAS. kfarnswo@illinois.edu. [2]
Bottles in Illinois

Andrew Fortier, ISAS. fortier@illinois.edu. [5]
Preliminary Analysis of Prehistoric Dog Coprolite Samples from the American Bottom, Southwestern Illinois

David Grimley, Drew Phillips, and Bob Bauer, ISGS. dgrimley@illinois.edu. [3]
Bedrock Topography, Drift Thickness and Geologic Province Maps for Seismic Hazard Modeling, Suburban St. Louis Region, Southwestern Illinois

Eve Hargrave, ISAS. ehargrav@illinois.edu. [12]
The New Mississippi River Bridge – IDOT: Building the Future, Preserving the Past

Sam Heads, INHS. swheads@illinois.edu. [21]
Review of the Cretaceous Tridactyloidea (Insecta: Orthoptera) and their Relationships

Kristen Hedman, ISAS. khedman@illinois.edu. [13]
Rediscovering Ancient Cahokia: New Insights from Old Collections

Nancy Holm and Elizabeth Luber, ISTC. nholm@istc.illinois.edu. [14]
ISTC Sponsored Research Program

Wei-Fone Huang and Leellen F. Solter, INHS. lsolter@illinois.edu. [23]
Infection of the Honey Bee, Aphis mellifera*, by the Microsporidian Pathogens* Nosema ceranae *and* Nosema apis

Don Keefer, ISGS. dkeefer@illinois.edu. [8]
ISGS Earth Systems Visualization Laboratory: A Collaborative 3-D Visualization Resource at the University of Illinois

Xinli Lu and Todd Rusk, ISTC. xlu@istc.illinois.edu. [15]
Energy and Water Savings with Heat Pump Application in an Industrial Cooling System

Robert Mazrim, ISAS, mazrim@illinois.edu. [16]
Beneath French Cahokia

Dale McElrath, ISAS. dmcelrat@illinois.edu. [10]
Illinois Projectile Points

John Scott, ISTC. jscott@istc.illinois.edu. [6]
Monitoring Contaminants in Humboldt Penguins

John Scott, ISTC. jscott@istc.illinois.edu. [7]
Quantitative Headspace Analysis of a Dried Fermentation Co-Product (DFC) from a Bio-Butanol Process

Felipe N. Soto-Adames, INHS. fsoto@illinois.edu. [24]
Diagnosis of Salina wolcotti *Folsom,* S. bidentata *(Handschin) and* S. thibaudi *n. sp., with an Identification Key to the* Salina *of the Americas*

Felipe N. Soto-Adames and Steven J. Taylor, INHS. fsoto@illinois.edu. [25]
Status Assessment for Springtails (Collembola) in Illinois Caves: Salem Plateau

C. Stohr, A. Stumpf, B. Stiff, and W. Haneberg, ISGS. cstohr@illinois.edu. [27]
Describing Inaccessible Outcrops along the Middle Fork of the Vermilion River, Illinois

Sarah Wisseman, ISAS. wisarc@illinois.edu. [19]
Close to Home? Pipestone Resource Utilization in the Midwest

Sarah Wisseman, ISAS. wisarc@illinois.edu. [20]
New Findings on a Roman Period Egyptian Mummy at the University of Illinois

Zoe Zaloudek, ISWS. zaloudek@illinois.edu. [17]
Comparison of 1%-annual-chance Precipitation Totals for Illinois: A GIS-Based Approach for Comparing ISWS Bulletin 70 to NOAA Atlas 14

Wei Zheng, ISTC. wzheng@istc.illinois.edu. [26]
Fate and Transport of Steroid Hormones and Veterinary Antibiotics Derived from Cattle Farms

NOTES

ACKNOWLEDGMENTS

Special thanks:

Bill Shilts, Executive Director

Prairie Research Institute
Office of the Executive Director (OED)

Prairie Lightning Symposium Committee
Dick Berg, ISGS
Cathy Bialeschki, INHS
Nancy Holm, ISTC
Libby Johnston, OED
Laura Keefer, ISWS
Elizabeth Luber, ISTC
Dale McElrath, ISAS
Gary Miller, OED
Steve Wald, OED
Angie Wisehart, OED

Session Moderators
Bob Iverson, ISTC
Renaé Strawbridge, ISGS
Al Wehrmann, ISWS

Graphic Design
Sara Olson, ISWS

Copy Editing
Cheryl Nimz, ISGS

IT/AV Support
Joshua Hall, ISTC
Vicki Salzman, ISGS
Jeff Young, ISGS

Consultants
Chris Harris, Public Affairs
Bridget Jamieson, Public Affairs
Yu-Feng Forrest Lin, ISWS

I Hotel and Conference Center

University Catering

Big Bluestem String Band