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SDWRI Water News

South Dakota Water Resources Institute

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SDWRI WATER NEWS

SOUTH DAKOTA WATER RESOURCES INSTITUTE
SOUTH DAKOTA STATE UNIVERSITY
COLLEGE OF AGRICULTURE AND BIOLOGICAL SCIENCES

MARCH 2014



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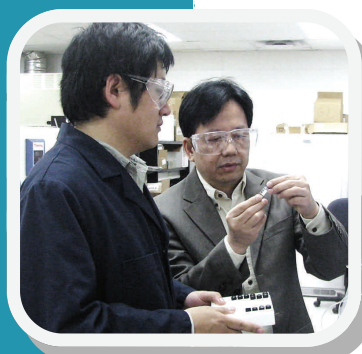
The project described below was funded by a SD WRI USGS 104b Award

Evaluation of Wastewater Produced in Biomass Pyrolysis Process

Dr. Lin Wei and Dr. Todd Trooien



Because of world population explosion and rapidly growing economy, food, water, and energy are the most urgent challenges need to be addressed today. Currently the modern world energy is heavily relied on fossil fuels such as oil, coal, and natural gas. Our future requires secure and affordable energy supplies but fossil fuels have some fated limitations. Combustion of fossil fuels has caused serious environmental impacts. As a result of the conflict between finite reserves of fossil fuels and the rapidly growing of world energy demand, energy price is continually increasing in recent years. We must find and develop alternative energy without disrupting food supplies or causing environmental degradation. Up-to-date biomass is the only known source for production of renewable liquid transportation fuels. Pyrolysis has been proven a very promising process to convert biomass materials such as corn stover, switchgrass, wood residues, etc. to liquid transportation fuels. Properly utilizing biomass can significantly contribute to national energy security, local economic growth, and environmental protection. However, biomass pyrolysis may also produce wastewater during biofuel production, as much as 20 to 50% of the volume of biofuel produced, depending on the biomass pyrolysis and bio-oil upgrading technologies used. This wastewater may have various contaminants and a high COD level, which would cause severe pollution if released into the environment without treatment.



Dr. Lin Wei and his graduate student (Zhongwei Liu) are doing HPLC analysis of wastewater.

To explore effective solutions for wastewater utilization for future biofuels industries and biomass feedstock producers before the impacts occur, a research team led by Dr. Lin Wei and Dr. Todd Trooien is conducting a study, called evaluation of wastewater produced in biomass pyrolysis process. This study is funded by USGS. The goal of this study is to evaluate the quantity and characterize the wastewater produced in catalytic pyrolysis of various biomass feedstocks. The research team includes two postdocs (Dr. Zhongyi Ma and Dr. Chunkai Shi) and four graduate students (Zhongwei Liu, Wangda Qu, Parvathi Jampani, and Dan Liu). They have completed catalytic pyrolysis tests for converting corn stover and sawdust to crude bio-oil and upgrading the bio-oil to advanced biofuels. The test results showed that 30 – 50% (w.t.) of wastewater would be generated when the advanced biofuels were produced. Wastewater samples were collected and characterized. Dissolved oxygen (DO), pH value, and salinity, measured as electrical conductivity (EC) were measured with portable probes for the wastewater. The research results show that the salinity risks posed by the wastewater samples are less than many irrigation water sources used in the region. GCMS analysis of the wastewater also indicate that there were still some water solvable organic compounds left in the wastewater. There may be still potential for harnessing value-added products from the wastewater if properly treated.

VOLUNTEERS NEEDED!

May 13th, 2014

FREE LUNCH!



FREE T-SHIRT!

Big Sioux



Water Festival – SDSU

*Providing water education to area 4th graders
through hands-on, Activities, experiments, and exhibits*

- ◆ This year 1,136 fourth grade students and 165 parents and teachers are attending from 32 area schools
- ◆ Over 200 people from surrounding communities volunteer for this event
- ◆ More than 40 presenters from South Dakota and Minnesota lead the festival activities and experiments
- ◆ It is the largest one-day festival in the state
- ◆ The festival is supported by national, state, & local organizations

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[facebook.com/bigsioxwaterfestival](https://www.facebook.com/bigsioxwaterfestival)
Ag Engineering #211

Lake and Stream Ecology and Water Quality Workshop

June 4-6, 2014
Custer, SD

Do you work with surface water resources?

Do you teach middle or high school science classes?

Do you own lake property?

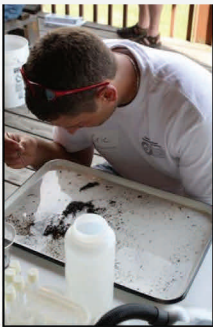
Do you care about South Dakota's lakes, rivers, and streams?

If yes, you need to attend one of these workshops!!



What will you learn?

- Aquatic invertebrate identification and collecting techniques
- Basic limnology principles
- Lake and stream ecology
- Water quality testing procedures
- How to interpret water quality data
- Environmental curriculum and classroom activities



The workshop will be held on the campus of Lutheran Outdoor's Outlaw Ranch located east of Custer, SD with field trips to the beautiful lakes and streams of Custer State Park.

Outlaw Ranch is known for it's excellent food, facilities, and hospitality! Participants requiring overnight lodging will stay in a modern lodge complete with shower facilities, comfortable beds, and wi-fi!



This workshop is FREE!!

Workshop materials, meals, and lodging provided at no cost to participants!!!!

Teachers can earn 2 Continuing Education Credit Units, and undergraduate or graduate students can earn 1 Credit Hour upon completion of all requirements and payment of credit fees.

Sponsored by:
Northeast Glacial Lakes Watershed Project
South Dakota Water Resources Institute
South Dakota Discovery Center and Aquarium



Funding for this workshop is provided by an EPA 319 Clean Water Information and Education Grant from the South Dakota Dept. of Environment and Natural Resources, and by a South Dakota, Division of Resource Conservation and Forestry, Conservation Commission Grant

For more information or to sign-up for a workshop

Visit: <http://www.neglwatersheds.org/waterquality.html>

Call or E-mail:

**Dennis Skadsen, Workshop Coordinator
605-345-4661 ext. 118
dennis.skadsen@sd.nacdnet.net**

ACE Camp 2014

JULY 13-16, 2014



Aerospace Career & Education Camp

- What:** A career exploration camp for high school age students interested in aviation or aerospace.
- When:** July 13th-16th, 2014
- Where:** Located in Brookings, SD at the campus of South Dakota State University
- How much:** \$350 per student includes introductory airplane flight, lodging, meals, and transportation at the camp (Scholarships available-see website for more information).

Sponsored by NASA and hosted at South Dakota State University (SDSU) every July, this four-day camp provides high school-aged students (those entering 9th grade through graduated seniors) the opportunity to get an early start on aviation and aerospace careers. At the camp, students will receive 2 hours of flight training, get behind the controls of and fly an aircraft, launch a space shuttle using a computer generated flight simulator program, and build and launch air rockets.

ACE Camp enables students to make informed decisions as they consider college and career options. Having completed the program, students are more knowledgeable about the importance and diversity of aviation and aerospace careers, how aviation and aerospace industries have developed and grown to what they are today, and are aware of future career opportunities and developments.



Register at: www.sdstate.edu (keyword: ACE camp)

ACE Camp 2014 Brookings, SD

- Fly an airplane
- Navigate using maps
- Learn about aviation careers
- Visit an air traffic control facility
- Visit an air national guard base
- Build a rocket
- Learn to fly by instruments only
- See how a jet engine works
- Meet new people
- Spend some time on a college campus
- Did we mention fly an airplane?!?!?!?



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<http://www.sdstate.edu/abe/wri/newsletters/index.cfm>

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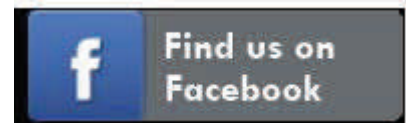
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