



Green Mountain Local Section of the ACS

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Green Mountain Section website:
<http://membership.acs.org/g/greenmt>

Officers 2005

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Upcoming Events

Fall, 2005 – Ingrid Applequist from
Unilever (date TBD)

Fall, 2005 – Vermont Winery Tour
(date TBD)

September 22 – Dr. William Zoller
– Chemical Outreach Program

October 16-22 – NCW Theme
“**The Joy of Toys**” Contest and
Mall Demo Events



ACS website: www.Chemistry.org

GMLS June Meeting, 2005

“Lake Champlain”

***A talk on fisheries management/research followed
by a cruise on Lake Champlain***

Date: Wednesday, June 22, 2005

Time: Talk at 5:00 p.m.
Dinner Cruise at 6:30 p.m.

Speaker: **Shawn Good**
Vermont Department of Fish and Wildlife

Shawn Good received an Honours B.S. in Biology and Aquatic Ecology from Trent University in Ontario, Canada. He also earned an M.S. in Marine Biology from Universite Laval in Quebec, where he studied the early life history Atlantic Salmon in the Riviere Ste. Marguerite, a tributary to the Saguenay River. Currently Shawn is a Fisheries Scientist at the Vermont Department of Fish and Wildlife.

Title: “**Lake Champlain Fisheries Management
and Research**”

The talk will comprise an overview of the various management and research activities that the speaker has been engaged in. The primary focus will center on walleye management, sturgeon restoration, and Sea Lamprey chemical-control methods.

Location: **Kalkin 001**
University of Vermont

For directions to Kalkin and parking options use the following link:
<http://www.uvm.edu/~tpswww/parkingAnnotatedCampusMap.pdf>. Your best bet for parking may be the visitors' lot on College Street

Cruise: **Spirit of Ethan Allen III**
Burlington Boat House
bottom of College Street, Burlington

The ship sails at 6:30, so you must be at the boarding site by 6:25 p.m. There will be a lobster dinner served, at a cost of \$25 to our section members and guests, which is a substantial, subsidized discount from the standard price of \$40. Entertainment will come from a baby grand piano on board. Please RSVP Willem Leenstra at 656-0273 or via e-mail by Monday, June 20 to willem.leenstra@uvm.edu [Note: the talk will finish promptly at 5:45 p.m., leaving a comfortable margin of time to get to the waterfront.]

Last Month's Talk on Soil Chemistry

by Michelle Johnson and Fiona Case

On May 18th Don Ross, Research Associate Professor, Department of Plant and Soil Science, University of Vermont gave us “a brief history of soil chemistry and soil testing”. This well attended event was hosted by the Chemistry Department at Middlebury College, who made us feel very welcome.

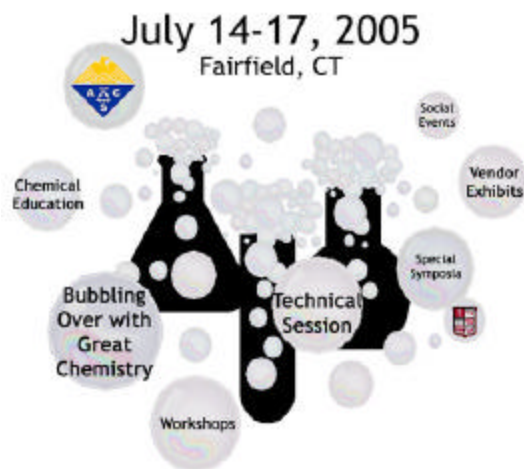
The text-book definition of soil is “the unconsolidated mineral or organic material on the immediate surface of the earth that serves as a natural medium for growth of plants” – but soil is also a complex biological and chemical entity including a host of microscopic animals. There are a range of different soil types in the USA. For example, the mollisols of the Great Plains have a deep, dark, nutrient rich surface layer. The red-colored, clay-enriched ultisols found in the southeast are much lower in nutrients. The colorful spodosols are quite common in Vermont, they have a light grey surface, above a reddish, aluminum and/or iron-enriched layer. They commonly host coniferous trees. Also found here are the Tunbridge soils (this is, in fact, the Vermont State Soil!), these are loamy, well drained soils, with a very dark brown surface above a light grey subsurface. They are particularly good at growing white ash, beech, birch, hemlock, red spruce, and of course, maple trees. There is a picture of Tunbridge soil at our website.

Soil science (and soil chemistry) has a long history. Early researchers such as Leonardo da Vinci, J. B. van Helmont and Robert Boyle observed that, if watered, a plant will grow in a pot without significantly lessening the weight of the soil (for example, when Boyle's willow tree grew to 200 lbs, only two ounces of soil were consumed). They concluded that plants were made entirely from water! Later it was realized that plants absorbed CO₂ from the atmosphere (in fact, all plant carbon is derived from the air); and John Woodward's observation that plants grew better when watered with London Thames River water was the first suggestion that dissolved solids and organic matter were also important. Much of the work in the early and mid-20th century focused on the structures and ion-exchange properties of the inorganic clays. More recently, the focus has moved to the organic matter, and the analysis of the surfaces of inorganic particles using new techniques such as EXAFS, XANES and atomic force microscopy. Don's group has been involved the detailed analysis of soils from many parts of Vermont. They have studied the effects of nitrogen (from acid rain) on forest soils and bog ecosystems, and the interaction between soil manganese oxides and heavy metals. For example, old paint from Vermont buildings can create significant local lead contamination (there are examples of this on

the UVM campus). The group has been investigating methods for dealing with this problem. They have also studied the dynamic behavior of this living system. As soon as one removes soil from its natural environment it starts to change – posing a challenge for soil testing, particularly testing for nitrogen content.

The pH of garden soil (an important thing to know) may be determined by diluting soil 1:1 or 1:2 in distilled water and measuring with a pH meter; although the addition of 0.1 M KCl slightly lowers the original pH, the KCl assists in stabilizing pH measurements. Most analyses of soil focus on the N, K, and P content. These are required nutrients. Phosphorus and potassium are found in most modern day fertilizers – the amounts reported on the packet are actually the quantities of the oxides, P₂O₅ and K₂O. Soil scientists in the 1700s believed that the purest form of elements were the oxides – as Don commented, some things take a long time to change!

Thanks for a very interesting talk, Don!



NERM-2005

Sacred Heart University in Fairfield, Connecticut is the site of this year's Northeast Regional Meeting, July 14-17. By going to their website at

<http://www.nerm2005.org/>

you will find that an interesting program has been planned.