

SLU Ph.D. Student Field Course “*Watershed Ecology and Management – From the Land to the Sea*” Rocks New York State

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SLU-Aqua concerns itself with aquatic life, and many people in the department research lakes, streams, and seas in and around Sweden. However, it is also the case that land interacts with water, something one might tend to ignore. This field course was designed for aquatic Ph.D. students to learn about connections between land and water, mediated through the watershed concept. Whether as small as a waterdrop on a blade of grass, or as large as the Baltic or even North Atlantic drainage basins, land and water interact.

Following a week of introductory lectures, eight Ph.D. students from SLU-Aqua – Yvette Heimbrand (course assistant), Philip Jacobson, Max Lindmark, Monica Mion, Alessandro Orio, Stefan Skoglund, Viktor Thunell, and Renee van Dorst – flew in to Syracuse, NY to join me and one of my ESF Ph.D. students, Hadis Miraly, on a 9-day field course, studying watersheds within New York state.

We began with a visit to the Thousand Islands archipelago that forms the beginning of the Saint Lawrence River, draining the Laurentian Great Lakes (holding about 20% of the world’s fresh water). We spent a day with Professor John Farrell, director of ESF’s Thousand Island Biological Station, studying wetlands, restoration problems, and current fisheries issues of the invasive round goby (*Neogobius melanostomus*) and decline of the signature predator, the muskellunge (*Esox masquinongy*). We were out in boats and canoes, and everyone got a chance to haul on a net.

We transited from there back down to Syracuse, where we studied Onondaga Lake on the shores of the city. Four hundred years ago, the lake was a small jewel, highly regarded

by the Haudenoshonee native people for its vast production of eels, salmon, and whitefish. But during the Industrial Revolution and population growth brought on by the Erie Canal, industry eventually caused massive pollution of the lake, leaving a toxic legacy that gained Onondaga the dubious title of most polluted lake in the U.S. However, environmental laws and court orders finally brought about an ambitious project to restore the

lake to a healthy condition. We learned that day about all of these things, saw fish and many



Stefan and Alessandro checking nets in French Creek, Saint Lawrence watershed.



Cecropia moth emergence, being documented.

restored habitats, then met ESF and later on Cornell graduate students to swap research and experiences.



View from the top of Goodnow Mountain, Hudson River headwaters region.

The remainder of the course took us from Syracuse to the Hudson River watershed, starting at the “top” of the watershed in the Adirondack Mountains (among New York’s best-kept secrets!) and working our way down to New York City, a distance of over 500 km. The Hudson is New York’s largest estuary with a tidal reach nearly 250 km and an excursion of 1.3 m, although most of that distance is freshwater due to the large inflows from two contributing sources,

the upper Hudson and the Mohawk rivers. Hiking through clouds of blackflies and mosquitoes with hosts Stacy McNulty and Margaret Murphy, we saw great plant and bird diversity in the Adirondacks, but we encountered fishless lakes – a mystery which the students speculated on and gave suggestions for research.



Monica with a fine striped bass.

The students were able to see and do things not previously done: sample fish with electricity on a boat and with a backpack shocker; watch fireflies blink on and off at night; observe the anadromous herrings, eels of practically all life stages, and the admixture of resident, potamodromous, and diadromous species that characterizes the Hudson ichthyofauna. They were impressed with the high species richness, not seen in Sweden, and also the enthusiasm and passion of the environmental scientists and practitioners we met along the way. We toured uplands, wetlands, canoed in a back bay, and were serenaded with river songs by musician (and good friend to KL) Jean McAvoy. We also met George Jackman, a former NYC cop

turned fisheries/habitat restoration specialist who now works for a local NGO called Riverkeeper. George toured us through a tributary stream that has many legacy dams on it, and discussed the process of working with local stakeholders to pull unneeded dams and restore tributary health. We even conducted a survey of fishes below one of the major dams for George – and found that there were several species that would be ready to recolonize the stream’s upper reaches.

The final leg of the trip took us down into New York City; we braved the morning rush hour and parked at Pier 40, lower Manhattan, there to meet staff from The River Project. It’s a small educational NGO that pipes in water from the Hudson River



“Eeling” with Liz LoGiudice in the Hannacroix Creek.

(variably brackish down here) and displays local ecology in tanks. They showed us restored oysters, seahorses and pipefish, and the threatened terrapin turtle, an estuarine species once common and now rare. From there, we hiked about 3 km along the River down to Battery Place at the southern tip of Manhattan, where the Hudson River officially begins at river kilometer 0. We were treated to lunch by the Hudson River Foundation, a private entity set up to fund research about the Hudson and its watershed. This was the end of the course.

There were many, many fun times, lots of laughter, occasional worries about the van and the weather, but overall, the course was an amazing experience on many levels. Having taught field courses in the past, I would say this was just about the best – great students, great shared experiences, and lessons that will take years for us to absorb.



Fin du cours!