

FE 538 Field Hydrology

<http://watershd.forestry.oregonstate.edu/default.aspx>



**Spring Break 2006
HJ Andrews Experimental Forest**

**Course Coodinators: Jeff McDonnell and April James
Course Instructors: Adam Mazurkiewicz, Nick Zegre, Willem van
Verseveld, Chris Graham
Course Videographer: David Callery**



Welcome:

On behalf of April James and our co-instructors, I would like to welcome you to the first Oregon-based incarnation of Field Hydrology! I have delivered versions of this course previously in New York (to students of the State University of New York College of Environmental Science) and led similar EARTHWATCH field campaigns in New Zealand and Japan. My co-instructors have a wealth of experience in similar field courses that they have been involved with in Quebec, The Netherlands, Indonesia and the USA. Others have worked for agencies like the NRCS and USFS as professional snow surveyors and hydro techs. We're all excited about delivering this course at HJ Andrews Experimental Forest and appreciate you signing up for this! We hope that the techniques you learn this week and the concepts you are exposed to will be useful to you in research and practice. While we expect many (hopefully most!) of the activities to be fun, we know that field work can be tough at times in bad weather (which we will no doubt have). Remember, the most important thing for you to bring into the field each day will be a good sense of humor. Please work safely and watch out for each other during your daily field exercises. Field hydrology has been going on for 50+ years at the HJA.

Jeff McDonnell

Course Overview (daily schedule)

9:00am	Assemble in the Library for a daily briefing
9:00-10:30ish	Lecture in library/field (see schedule below)
11:00	Depart for the field
4:00-5:00pm	Return from the field
5:30pm	Dinner
6:30pm	Begin data crunching and interpretation
10:00pm	Assembly in library for group .ppt "results" presentations
11:00pm	Free time

Lectures:

Sunday	Arrive at HJA ~ 7:00pm Organizational meeting, Library (8:00-9:00pm) Field Hydrology Videos: Mountains in the mist (40 min) Discussion
Monday:	Introduction to the HJA site and logistics Kathy Keable, HJA site manager

Overview of small watershed hydrology at the HJA
Julia Jones, Professor, Dept of Geosciences OSU and LTER PI

Tuesday Hydrological processes: from the plot scale to the hillslope scale
Jeff McDonnell (lecture to be given at the WS 10 trench site)

Tour of the WS 10 flume by Craig Creel

Wednesday The snow energy balance
Jeff McDonnell (lecture to be given in the snow)

Thursday Hydrological Processes: From the hillslope to the watershed scale
Jeff McDonnell (lecture to be given at the WS 01 riparian zone)

Friday Hydrological modeling
Jeff McDonnell (lecture to be given at the WS 01 riparian zone)

Tour of PRIMET climate station, John Morrow

Saturday Depart at 10:00am

The HJA Facility (*text from the HJA web site*)

The Andrews Forest is situated in the western Cascade Range of Oregon in the 15,800-acre (6400-ha) drainage basin of Lookout Creek, a tributary of Blue River and the McKenzie River. Elevation ranges from 1350 feet (410 m) to 5340 feet (1630 m). Broadly representative of the rugged mountainous landscape of the Pacific Northwest, the Andrews Forest contains excellent examples of the region's conifer forests and associated wildlife and stream ecosystems.

Several distinctive aspects of the Andrews Forest environment and research program have placed it center stage in the science and politics of natural resource management in the region. Basic watershed research in the Pacific Northwest has its roots in small watershed experiments involving forestry treatments initiated in the 1950s. The Forest contains extensive examples of old-growth (500 year old) forests which were subject of intensive basic research beginning in the 1970s. The original work on northern spotted owl and its relations with forest habitat was conducted at the Andrews in the 1970s, setting the stage for extensive monitoring studies that continue. Studies of carbon cycling over the past two decades have revealed the exceptional properties of Pacific Northwest forests at the scale of a single tree to the regional scale in terms of carbon sequestration. The Andrews Experimental Forest serves as a science benchmark for each of these themes and thus has been examined in terms of its regional context and representativeness.

The Andrews Forest is administered cooperatively by the USDA Forest Service's Pacific Northwest Research Station (USFS Research), Oregon State University (OSU) and the Willamette National Forest. Funding for the research program comes from the National Science Foundation (NSF), Pacific Northwest Research Station, Oregon State University, and other sources. The Andrews Forest is one of the 24 major ecosystem research sites in the United States funded through NSF's Long-Term Ecological Research (LTER) Program.

Safety

Safety is of paramount importance in this field course. If there is ANY situation in the field that appears risky or dangerous, then DO NOT do it. Conditions may change quickly with weather and we expect you, the student, to work safely and avoid places that may become unstable etc. Anyone driving the snowmobile must have completed the safety course with Jay Sexton beforehand. Each group must take a 2-way radio with them each day into the field each day. We will go over the protocol for daily radio check in. During your field modules, please report any issues to your instructor. He/she can help with extra/dry clothing as needed. Do not suffer in silence! This is especially true for the snow module. Two particular areas where extreme caution will need to be taken will be the WS 10 hillslope and the WS 10 stream channel. The wooden walkways on the WS 10 hillslope are quite weathered. Please be extremely careful on the wooden walkways. Do not trust that they will support your weight. Willem will guide you around the safe paths on the slope—please walk exclusively in these areas. In the WS 10 stream, do not walk up the slippery bedrock channel unless you have on a pair of felt sole boots. We have rope to assist you in and around the trench. Areas outside of this are very slippery and dangerous. Be safe. Have fun. Learn lots. Additional safety info is included as an appendix to this course outline.