### 2009 Institute Participants (April 2009 List from Desiree)

<table>
<thead>
<tr>
<th>Name</th>
<th>Discipline</th>
<th>Project</th>
<th>Primary Adviser</th>
<th>University</th>
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<tbody>
<tr>
<td>Amanda Amstutz</td>
<td>ecosystem</td>
<td>Wood in streams</td>
<td>Desiree Tullos</td>
<td>OSU</td>
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<td>Meridith Bartley</td>
<td>ecosystem</td>
<td>Stream Temp</td>
<td>John Selker</td>
<td>W. KY Univ.</td>
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<td>Hoan-Vu Do</td>
<td>ecosystem</td>
<td>Ecosystem Flux</td>
<td>Barbara Bond</td>
<td>San Diego State</td>
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<td>Dylan Thomas</td>
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<td>Fire Frequency</td>
<td>Enrique Thomann</td>
<td>Dartmouth</td>
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<td>Alexandra Naegele</td>
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<td>Barbara Bond</td>
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<td>Gregory Reeb</td>
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<td>Climate Tracking</td>
<td>Julia Jones</td>
<td>U Wisc-Mad</td>
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<td>Jose Rojas Echenique</td>
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<td>Moths and Meadows</td>
<td>Tom Dietterich</td>
<td>U. Chicago</td>
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<td>Michelle Leane Wimerip</td>
<td>math</td>
<td>Moths and Meadows</td>
<td>Tom Dietterich</td>
<td>Wesleyan</td>
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<td>Raymundo Navarrete</td>
<td>math</td>
<td>Climate Tracking</td>
<td>Julia Jones</td>
<td>U. Arizona</td>
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<td>Brian McKenzie</td>
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<td>Andrew Ngeow</td>
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<td>Andrew Zdyrski</td>
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<td>Julia Jones</td>
<td>U Hawaii Hilo</td>
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<td>Eli Moss</td>
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<td>Jonathon Gillick</td>
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<td>Julie Lapidus</td>
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<td>Ben Dawson</td>
<td>bioengin.</td>
<td>Stream Temp</td>
<td>John Selker</td>
<td>OSU</td>
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### Key Concepts / Research Topics for 2009 (Tentative Listing as of May 21, 2009)

- **Storage and Release of Water at HJA:** monitoring, surface/subsurface hydrology, WS6-7-8; microclimate stations, LiDAR, fiber optic DTW, heat budgets, ice tracers, soil penetration tests, soil volumes, regolith thickness (Selker, Johnson, McDonnell)

- **Effects of Climate Change and Forest Management on Snow pack at HJA:** WS-7, rain-snow transition, clear-cut/old growth, modeling and scaling; variables, temp-precip-vegetation, climate, snow pack, time series, retrospective analysis (Nolin, Sproles, Jones, O’Connell)

- **Fish Habitat and Wood:** stream restoration, evaluation of wood structures and effects on channels, sediment storage, fish populations, wood retention, organic/inorganic retention capacity (Tullos, Wildman)

- **Butterflies and moths:** Blue Rive region, plant and moth population students, GIS, Google Earth, independent variables, historical change (Bettes, Miller, Wong, Kovchegov)

- **Diurnal Fluctuations of Streamflow:** topographic indices, transpiration, soil moisture, streamflows, WS-1 and Alsea River, soil types, slope, climate, transpiration controls on streamflow?, sap flow, discharge, piezometer, lysimeter, soil cores, tracer tests, soil depth mapping (Hale, Jones, Bond)
2008 Institute Concepts – from Final Projects / Presentations

Student projects – in teams of 3, with 3-4 OSU faculty mentors

**Ecohydrology Project**

Relationships
- Process
- Drivers
- Streamflow fluctuation
- Forest management
- Ecology and hydrology

Coast Range Project
- Soil moisture
- Discharge
- Water potential
- Soil permeability
- Wood / basal area

HJA work
- Water budget for WS2
- Determine evapotranspiration

**Project: Effects of Climate Change and Forest Management on Snowpack**

HJA work
- Meteorological stations
- HJA study sites / met stations
- Question: how does veg. growth effect met.

Measurements
- Hypothesis: > veg. > shad, <temp. and < solar radiation, < wind speed, > snow
- Examined 3 HJA met stations: tree distance, angle, height, whorls
- Data mining – met. Data
- Gap light photos / analyzer software
- Solar radiation measurements
- Relate veg. growth over time to solar input

**Moth and Meadows Project**

Moths-ecosystems-consumers
- Climate change indicator
- GIS mapping
- Moth population counts
- Species identification
- Species vs. environmental conditions
- Moth population modeling

Probabilistic modeling
- Data mining
- Species-habitat associations
- Null hypothesis
- Hypothesis testing
- Database / SQL
- Apriori modeling – shopping basket analysis
Woody Debris in Streams

Quartz Creek / McKenzie
Constructing woody debris jams

5 year monitoring data on channel morphology, wood/leaf retention, and stream geomorphology

Monitoring wood movement
Some fish population data

Active experiment – ginkgo leaf drop
6 – 50 meter reaches
Fish census
Days-to-weeks observations in field

Project: Subsurface flows in headwater catchment

Catchment-scale runoff and storage
Stream temp and tracer study
“subsurface topography” influence on water movement

HJA WS-7
Salt tracer
DTS fiber optic
Excel, MatLab, “OpenDX”

Tracer study – 36 hours, 300 meter reach
Conductivity measurements
Discharge measurements

Longitudinal temp. profiles

Bayesian networks
Wood retention / retention time
Cabled vs. un-cabled jams
Time series analysis
Fish population per sq. m
20-year study / data set
Tranquil vs. turbulent conditions
Channel width and depth measurement

Conductivity and temp diagrams
Blow counts, soil penetration test, depth to refusal = “bedrock” (Taylor comment, what about cobbles and boulders?)
Regolith thickness model
Time series – groundwater levels over 2 days
Macropore flow (roots, burrows)
“bedrockology” is a term that is used… arghhh

2007 Institute Project Titles

The Effect of Topology on Fuel Moisture (J. Best, A. Tepley)
Key Concepts: Fire disturbance, succession, management, transects, fuel moisture, time scale: 24 hr; location variables – slopes, aspect, air temp; topography,

Determining Factors that Reflect Aphid Presence (G. Layman, S. Moore, E. Borer, Ph.D)
Key Concepts: Aphid counts, quadrats, box traps, site variables / locations

How Debris Flow Channels Refill in the Western Cascades (A. Lambie, F. Swanson, Ph.D)
Key Concepts: Freq. and volume of debris flow disturbance in WS10, HJA; quantify post-debris flow wood and sediment accumulation; field measurements, volume estimates; wood / sed. accumulation rates in channels scoured during debris flow; wood as sed. storage mechanism

Coherence of Net Primary Productivity Estimates (K. Hagmann)
Key Concepts: Biomass measurements, reference stands,
Effects of Gopher Mounds on Plant Species Diversity in a Meadow System (N. Griffin, C. Halpern, Ph.D)

Key Concepts: Pocket gophers, grass / plant species richness, gopher disturbance, 1-m quadrats; plot spacing vs. species associations

Visualization of a Forest System (J. Hill)

Key Concepts: Virtual forest, visualization, visual C programming

Do Food Webs Follow Predictions from Simple Theory? (J. Ramos, E. Borer, Ph.D)

Key Concepts: Biomass, food webs, species richness,

Coho Salmon Spawning Preference in Artificial Stream Channels at the Oregon Hatchery Research Center (L. Weiss, D. Tullos, Ph.D)

Key Concepts: Gravel size, water depth, water velocity – affects on spawning habitat; hyporheic zone; dissolve oxygen, flow conditions, artificial streams, upwelling/down-welling in hypo. Zone. Substrate grain size, tracer test, salt concentrations, grain size analysis, D50,

Dendroecology: Separating Effects in Ring Growth in Pseudotsuga Menziesii Response to Fire (M. Press, A. Tepley)

Key Concepts: Tree rings, cores, DBH, doug fir, treatments vs. ring growth

Multivariate Techniques for Modeling Storm Hydrographs in the HJA Experimental Forest (M. Martin, J. Jones, Ph.D)

Key Concepts: HJA, WS2, WS8, WS9, stream order, slope length, gradient, storm events, hydrographs, base flow, peak discharge, event duration, peak-lag, precipitation event, principle components analysis, antecedent moisture, multivariate statistical analysis

Modeling the Effects of Hyporheic Flow on Stream Temperature (Z. Salem, E. Thomann, Ph.D, J. Jones, Ph.D, J. Ramirez)

Key Concepts: Hyporheic flow, flow velocity, stream temperature model, groundwater flow, flow model, heat transfer model,

Equations of Motion for Shallow Gravity Flow (R. Williams)

Key Concepts: Bouyancy, pressure, temp, density, velocity, fluid flow, heat loss, katabatic flow, equations defining flow

The Effect of Temperature on the Survival of Chinook Salmon Eggs and Fry: a probabilistic model (M. Teose, E. Waymire, Ph.D, J. Dunham, Ph.D, J. Ramirez)

Key Concepts: Dams, temperature control, spawning, salmon eggs, incubation temperature, biomass, population size, modeling growth rate, probabilistic modeling,