

2012 Coweeta LTER Winter Meeting Notes

7 & 8 February 2012

Summarized by Jason Love, Coweeta LTER Site Manager

February 7th

Meeting started at 2:16 p.m.

Co-PIs present: Band, Barrett, Benfield, Bolstad, Bradford, Dehring, Depken, Elliott, Emanuel, Ford, Fraterrigo, Hepinstall-Cymerman, Heynen, Jackson, Knoepp, Leigh, Maerz, Mohan, Moore, Nelson, Pearson, Pringle, Shepherd, Swank, Turner, Webster; Chamblee (IM) and Love (SM) also present; Clark could not attend, but listened to half of the briefs via GoToMeeting; Vose could not attend

USFS Updates (Ford)

- Jim Vose is stepping down as Project Leader to begin Center for Integrated Forest Science and Synthesis (CIFSS) with David Wear
- A pioneering research unit in the SRS, will focus on anticipating policy-relevant, complex questions re: forests & society, and developing new research approaches to address questions
- Unit's design includes: 1) innovative interdisciplinary research and synthesis, 2) small core of permanent scientists, 3) rotating staff of visiting scientists
- CIFSS is based in Raleigh (NC SU); Jim's last day at Coweeta will be in May
- A new Project Leader will be announced February 13th (note – on Feb. 13th, Chelcy Ford was appointed as the new PL)
- Barry Clinton retired in December 2011 after 22 years at Coweeta
- Anticipate hiring new scientist to fill in behind Jim and Barry sometime in the winter of 2013; this position will likely be an ecohydrologist that can bridge the gap between theoretical and applied sciences
- USFS recently hired Corrine Block (former LTER graduate student under Jennifer Fraterrigo) to help Stephanie digitize and archive old hydrographs, etc.
- Climate Change Adaptation and Mitigation Management Options (CCAMMO) – Jim Vose and Shelby Gull-Laird (Coweeta post-doc) heavily involved in this project that gives suggestions on how different sectors of the economy could adapt under different climate change scenarios; book due out next year (Vose)
- Chelcy and Jim involved in the National Climate Assessment
- The National Climate Assessment is mandated by the US Congress (Global Change Research Act) to assess the impact of climate change impacts on the nation's resources (nation's version of the IPCC); the Forestry section is being led by Vose; Chelcy had 4 month stint in D.C. to help facilitate the National Climate Assessment process
- Hemlock and HWA project is starting to run down – have met nearly all their research targets and produced several strong publications that have been cited numerous times
- Now have 9 Remote Assessment of Forest Ecosystem Stress (RAFES) sites, including 2 at Coweeta
- Have 2 eddy flux towers: Coweeta and a new one at Crossett EF in Arkansas

- Knoepp, Vose, and others received 114K over two years from a TVA settlement to assess cation depletion and the impact of liming to restore cations in forested watersheds impacted by acid deposition
- Elliott and Vose received 25k over two years from Region 8 to synthesize current herb diversity and composition in southern Appalachian cove forests, to identify key knowledge gaps, & suggest approaches to fill gaps
- Ford, Bolstad, Vose, Brantley, Novick received 0.46M over five years from the USDA National Institute of Food and Agriculture (NIFA) Agriculture and Food Research Initiative (AFRI) competitive grants Foundational Program; Research will quantify the age and structural dependence of the hydrologic cycling in eastern deciduous forests by measuring the variation in hydrologic components across an early succession to old - growth forest chronosequence

Brief presentations on potential future directions for the Coweeta LTER

The Science Advisory Committee selected a group of mid- to late-career scientists that have been engaged in LTER research to give their vision of what type of research the CWT LTER should be pursuing in the next grant cycle. This same group of scientists is being considered for serving on the Science Advisory Committee and to help write the Coweeta VII proposal.

Jennifer Knoepp

- CWT LTER has a long term record of looking at different gradients
- But there are some gradients that we haven't fully taken advantage of, such as: regional precipitation gradients (Highlands (104" rain/yr) to Marshall (37" rain/yr)); sulfate deposition gradients; regional geologic gradients that have different sensitivities to sulfate and nitrate deposition; and regional gradients in land use change
- Jennifer suggested that in the next grant that we expand the core LTER measurements to include these different gradients

Scott Pearson

- Scott took a retrospective look at Coweeta research to help inform which direction we should head with the new proposal
- CWT has long-term ecological research with a growing emphasis on human influences on ecological systems and ecosystem services
- He brought up the Integrative Science for Society and Environment (ISSE) and suggested that we need to do research that matters, focusing on identifying recovery, resilience, and vulnerabilities in ecosystem services for the southern Blue Ridge
- We need to discover the critical thresholds at which ecosystem services become compromised, as well as the spatial distribution of these ecosystem services and where changes are taking place that might compromise these services
- We need to broaden the spatial scale of the study area and incorporate areas that provide ecosystem services of interest and areas that use them
- We should focus on measuring LTER core areas of research
- Also need to identify hotspots of change
- To accomplish this, we will need strong partnerships, both NGOs and state and federal partners

Mark Bradford

- Mark's overall theme was the importance of recognizing the role of individual/local variation in shaping the regional matrix and processes
- He brought up the current challenges to CWT LTER: multidisciplinary effort, but only meet twice a year; to include all levels in the discussion and learning, from undergraduate students to SAC; lack of a defined management structure; and that we need to clarify our conceptual framework (the latter two challenges were also brought up by the mid-term review team)
- Mark highlighted the idea that species, individuals, and their interactions matter in regulating ecosystem processes; this was highlighted in the midterm review as an exciting area of development given our historic focus on ecosystem ecology
- We should focus research on regionally or locally abundant species that are known are likely to be influential in ecosystem processes
- Also should focus on nutrient fluxes and community responses when these common or abundant species are manipulated
- This would be building on the strong history at CWT of monitoring to develop mechanistic understanding that can be extrapolated across the region, and used in projection of ecosystem change

John Maerz

- John showed a map illustrating the power of partnerships in expanding the geographic scope of a study on salamanders
- We do a lot of studies on salamanders at Coweeta, but many of the salamanders, as well as a host of other species, are at the southern limit of their range
- It limits the inference we can make on things like climate change impacts on salamanders, since these fauna are already at the "edge" of their range and/or physiological limits
- More northern salamanders of the same species might be more redilient to climate change and other disturbances.
- We really need to expand the regional emphasis of the research; it will be difficult, but not impossible if we are strategic about choosing partners and existing data

David Leigh

- David organized his talk into 3 Themes: Time, Space, and Causality
- For Time, David envisions:
 - Try and cast back further in time to really appreciate the impacts of the "Anthropocene" (e.g., more paleoecology)
 - Maintain & extend forward-looking LTER perspective (forecasting/predictions from previous data and findings)
 - Examine temporal aspects of reaction, response, recovery of social, physical, and ecosystems to human impact and climate change (ergodic principle & experimentation)
- Space:
 - Evaluate different spatial arrangements & assemblages (i.e. riparian buffer types, urban development styles)
 - Spatial analysis of social, physical, ecological systems (spatial impact thresholds, differences in spatial arrangements of drivers, etc.)
 - Extend beyond the Upper Little Tennessee basin to involve wider array of spatial & temporal scenarios

- Causality:
 - Go beyond correlation and seek to establish cause-and-effect relationships
 - Build upon many of the driver-response correlations that we have already identified (i.e. streams narrowing & baseflow reduction in developed areas)
 - Answer some of the big questions that we have raised with our current research emphasizing temporal and spatial perspectives

Rhett Jackson

- Rhett used the example of how different river systems, even those in close proximity to one another, can have radically different unit area peak discharges
- Speaks to the need in expanding the number and spatial extent of study sites
- Also he showed Jack Webster synoptic chemistry data – we really didn't have a good gradient of sites – most of them clustered, but some stood out (e.g., Watauga) – why is this and might these outliers provide insights to how streams might look like in the future?
- We need to better understand how much land use change is too much – what is the threshold at which water quality and other ecosystem services start to decline
- Also need to take a closer look at how land use effects (e.g. long reaches without riparian buffers) may act to isolate fish and amphibians
- Need to extend the hemlock study to see what happens to the coarse wood and how this accumulation might impact streams

Jeff Hepinstall-Cymerman

- Jeff would like to see us continue to link ecosystems with organisms and how these change with extreme climate events, variability, etc.
- There would need to be increased monitoring and partnering with other organizations
- Also would like to see us focus on individual responses and community changes
- The southern Appalachians are the southernmost limit for many species; we need to document changes in species/communities at the interface between S. Appalachia and the Piedmont
- We need to place more emphasis on modeling, both process based and statistical models
- Instead of focusing on the Little T basin, we need to broaden the spatial scope and look at the urban ring around S. Appalachians and examine land use-driven changes in climate, as well as urban-derived changes in weather
- Suspended developments might help to inform us the role of houses, dogs, people have on ecosystem services and populations; he used the example of Camille Beasley's project looking at suspended developments and bird diversity/abundance
- Moreover, we need to identify multi-scalar stakeholder-driven scenarios of the future
- We need to place a value on ecosystem services and use it as an organizing principle for translating ecological processes to the public
- We need to look into landscape resilience to climate change and land use
- We need to have cross-organizational collaboration (NEON, Appalachian Landscape Cooperative, GLEON, etc. to expand the spatial scope of the study area, as well as cross-site collaborations with other "forested" LTER sites

Nik Heynen

- Nik has been spearheading the Coweeta Listening Project
- It is more than just a biweekly column in the Franklin Press

- Have been meeting with local organizations and stakeholders and translating ecological science to the public, while at the same time collecting data
- It is difficult to couple ecology and social science, but not impossible – Coweeta Listening Project might be a window into what is possible in the future

Carolyn Dehring

- One of the challenges is to produce research where have both ecology and social/economic science
- If we scale up at the regional level, we need to be realistic with the data that might be available (e.g., we might not have parcel-level data, just census data)
- Would like to see us place an emphasis on flood risk in S. Appalachia
- Can be difficult to collaborate even with the CWT LTER because of distances, different disciplines, but need to find a way to work together and get “hands in the data together”

Discussion

- Pringle – Liked Dehring’s idea of “getting hands in the data together”
- Band – Appalachian Mega-transect (Cary Institute) as an example of a strategic partner
- Social scientists starting to pick up some of the same events that ecologists have found going on at the parcel level
- Dehring – Brought up the point that we have data or are in the processing of collecting data that might show which socioeconomic groups are better stewards.
- Bradford – need to look at the historic template vs. future template
- Leigh – We need to broaden the region and really define the research questions, as we have limited resources to answer everything
- We need to do some data discovery – see if we can find data that has already been collected by USGS, state agencies, etc.
- Shepherd – discussed how he is already involved in regional research that is examining the arc of urban areas around southern Appalachia (Atlanta, Charlotte, Asheville, Knoxville)
- It would be interesting to see how people in urban areas are spreading invasives by traveling to the mountains, etc.; need to think about doing research in a regional “arc” around Coweeta, similar to Shepherd’s example
- Fraterrigo – need to assess vulnerability at different levels and scales
- Bolstad – connect process at small scale studies to larger areas
- Maerz – need to assess the adaptability of communities
- Band – need to take advantage of MODIS and other remote sensing data and then ground truth with observational data
- Bradford – need to really work on the conceptual framework of the research; needs to overcome the jargon; what is our “elevator speech” for the current research
- Turner – we haven’t emphasized theoretical research (e.g. landcover cascade)
- Band – if we expand the spatial scale of our study area, we will need to be strategic and pick variables that are scalable (e.g. carbon and water)

Meeting adjourned at 5 pm

February 8th

Meeting started at 8:30 a.m.

All Co-PIs present except Clark, Dehring, Shepherd, and Vose

- h themes
- The categories are linked to project proposal forms
- The catalog helps Coweeta show how we are accountable for what we said we would do in the proposal
- Population and System Dynamics category needs some work – need help in thinking how to help with this project; need volunteers or Ted will ask
- Need to get component list nailed down
- 1,400 people associated with CWT LTER and over 2,000 publications – trying to simplify categories to make it easier to navigate the catalog

Site Management Updates (Love)

Safety

- The USFS is taking a renewed look at its safety policy and making it a core priority
- Based on feedback from Jim Vose, Ted Gragson, Randy Fowler (Coweeta's Safety Officer), and the newly formed graduate student committee, Coweeta LTER now has a more formal set of safety protocols built around 4 main themes:
 - 1) Check in/check out (make sure someone knows where you will be working and when you expect to be back from the field)
 - a. There is a whiteboard next to the metal cabinet in the Analytical Lab where the vehicles are kept for folks to sign out during normal Coweeta work hours (M-F, 7:30 – 4:00)
 - b. If others are in the dorm, let someone in the dorm know where you will be working and when you expect to be back.
 - c. If no one is in the dorm and you will be working after hours, on holidays, or weekends, please let the Site Manger know where you'll be working.
 - 2) Personal safety equipment – hard hats, orange hunter safety vests, and first-aid kits are now located in each vehicle; please have the hard hats on you when you are in the field so you can put them on if the wind begins to pick up or you find yourself under dead hemlock; please wear your orange safety vest during hunting season; make sure you check out a radio or have a cell phone on you (in areas where you can pick up a signal) in case of emergency
 - 3) Vehicle safety – make sure you check in with the Site Manager before driving Coweeta LTER vehicles for the first time
 - 4) Avoid working in hazardous situations – The Coweeta Project Leader, Site Manager, and Safety Officer have the responsibility of making sure folks are engaging in activities that are safe. If they see researchers who are engaged in unsafe activities, they have the authority to require researchers to wear appropriate safety gear or to cease field activities until the scene is safe or proper training is completed.

Things researchers need to do before the field season

- Please let Jason know if you or your students/techs will need a vehicle for the summer

- Please let Jason know how many beds and the approximate dates that you or your graduate students/techs will need the dorm
- Let me know both of these things by April 1st so I can plan accordingly

Summer internships

- We will have 2 REU students: one will working with Robert Warren, Scott Pearson, Mark Bradford, and I on the hillslope plots measuring coarse wood and ant colonies and one will be working in streams with salamanders
- We will also have an Research Experience for Teachers (RET) position – they will be at Coweeta for 10 weeks, tagging along for different projects to “learn how real science is done,” these experiences will be captured in approximately 18 podcasts that the teacher can then share with his/her students

Breakout session: Hillslope Conversation

- Need overland flow measurements – consider putting in after other instrumentation is up at sites that have obvious overland flow
- Need to schedule field trip for PIs to visit sites
- Soil 02 sensors can be instrumented at some of the sites (Band)
- SUNA (UV nitrate probe) will be placed at WS14 above the weir; try to put it in around March (Band)
- Do we abandon 1 of the 3 mountain development sites? Maybe get one big river bottomland site? The consensus is that we drop one of the mountain development sites and instead install a site at Tessentee Bottomland Preserve along the floodplain of the Little Tennessee
- ICON – mapping extent of suspended developments in Cowee Mtns. in cooperation with the Land Trust for the Little Tennessee (Pringle)
- Might need to expand the monthly TDR measurements to a traditional valley development

Meeting adjourned at 4 pm