

Faculty Mentoring Committee

Matthew Ross

2/24/2019

Dr Moore,

In my first year at Colorado State, I have focused heavily on submitting competitive, national grants with a regional or global focus with colleagues from across the country. These range in topics from global scale water quality monitoring using satellites, to national scale data syntheses to look at watershed controls on element export across climate and geologic gradients. To date, these efforts have all been with people outside of Colorado State, which has largely been intentional, since I had a year of post-doctoral work to prepare for my job here and built collaborations towards that goal. Moving forward I expect to submit more grants with local collaborators focused on local issues of water quality including: looking at the nested impacts of urbanization, fire, mining, and agriculture on water quality. I expect this nascent work will include a large list of local collaborators including folks at CSU (Stephanie Kampf, Tim Covino and Aditi Bhaskar), the US Forest Service (Chuck Rhoades), and the city of Fort Collins (Jared Heath and Basil Hamden). My first effort in this direction was a grant with Ed Hall to study the current and future trends of algal blooms in Front Range reservoirs. This Grant has been recommended for funding by the Colorado Water Institute.

Beyond grant writing, I have also begun to contribute to our department's educational goals both through mentorship and teaching. In particular, I have started a focused discussion on improving our Watershed major curriculum by building up our student's analytical skills by delivering homeworks in a similar way across our 400-level courses (focusing on using R for analysis). In addition to this long-term goal, I have started teaching both Water Quality and Land Use (WR418) and Water Quality for Wildland Managers (WR419). I have substantially changed both of these courses, with a focus on connecting a working knowledge of chemistry to understanding large-scale water quality problems (WR418). In the lab course (WR419), I have heavily emphasized the importance of understanding both how water quality data is collected, generated, and distributed, with a deep understanding of how to analyze and understand that data, by using real-world datasets. In addition to these more formalized teaching efforts, I have also taken on 4 independent study students working on two distinct projects. The first group is working with the USGS to look at trends in Selenium concentration in the Gunnison river basin, while the second is looking at the variation in river water quality as it maps onto measures of wealth, status, and race.

Finally, for my service components, I have become chair of the NREL education committee, with a focus on improving the outreach capacity of our group. As part of this work, I have successfully sponsored an NREL staff-scientist (Chris Dorich) to receive funding to deliver a summer course aimed at teaching people how to develop and host interactive data visualizations (through Shiny R). I am also a member of the search committee in ESS looking to hire a biogeochemist. As a member of GDPE, I am also actively working with students in GDPE to build a lasting document that guides incoming students towards analytical resources (mostly R based).

Looking forward, I have several goals for the next year. First, successfully recruit graduate students (interviewing 3 this week) and secure funding for their work. Second, develop and deliver a powerful R-based data analysis course to graduate students. Third, continue to improve my WR418 and 419 courses. Fourth, build a live-streaming sensor network in the Poudre river in collaboration with the city of Fort Collins and *in-situ*. This work is already under way and we have successfully chosen seven sites from Laporte towards Greeley where we will instrument the Poudre with 10-minute interval sensors recording turbidity, discharge, specific conductance, temperature, pH, and dissolved oxygen. This sensor network will be used as a research base for my graduate students, but also as an educational tool in both my 418 and 419 courses as well as other WR courses.

For the next five years, my goals are to: 1) have an active research program exploring issues of watershed science, ecosystem ecology, and water quality at both the national and global scale and at the local field

scale. 2) Have successfully transitioned our WR courses to being more tightly connected in both content and analysis approach. 3) Have successfully graduated my first graduate students, and 4) helped build on the collaborative and helpful atmosphere within the watershed group at CSU.

My current concerns are primarily about time commitment, primarily teaching. I am currently signed up to teach two courses during spring semesters (418 and 419). With a single graduate course in the fall, my teaching load would be 3 courses. I would like to have this closer to 2.5 or less. I can see making this work by either paying one of my students to teach one of the WR undergrad courses, or by not teaching a grad course every other fall. This is particularly important as the first grad course I will deliver, will be a fairly intensive coding course that is more time-consuming than a typical grad seminar. Other than that, I feel supported and able to accomplish my goals, with particular gratitude to the watershed faculty for making my transition smooth.

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