



The Water Quality Team

A graduate education experience

linking disciplinary growth with human resource skill development

The Brown Book

A resource for members of the Water Quality Team

intended to help each of us optimize our experience

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Introduction

Welcome to the Water Quality Team. This document is intended for current and potential Team members as well as others interested in thinking about a Team approach. This document will assist a relatively small number of people in optimizing their working relationships and professional growth.

We are a relatively large group of graduate students (~12-15 at any one time), 1-2 staff members and 2-5 undergraduate students, advised and/or employed by Jim Perry. All of us are participants in the 'team based approach to graduate education'. Some of us are strongly committed to the logic of the team and others are here because it was a prerequisite for being advised by Jim. We are tied together by the common belief that weaving human resource skill training into professional development will make us more effective in our careers and personal lives. We are committed to the evolution and implementation of a team approach in our attempts to develop both our human resource skills and our professional growth

Each student comes here to increase his/her education and to learn skills that will be useful in life (in both our professional and personal lives). Historically, academic training has focused on building disciplinary skills (i.e., increasing depth in a chosen field). That effort has paid most attention to helping people excel as individuals. However, people function as isolated individual very rarely in either their professional or personal lives. Human society today is highly interactive and is becoming more so, requiring us to function in many group settings each day. The Team is the route we use to increase our human resource skills (e.g., communication, team building, group dynamics, facilitation) in parallel to growth in our discipline.

The Team and its foundations

The term 'Team' has been interpreted and applied to specific settings in the business world (e.g., Pfeiffer and Nolde, 1991). As commonly applied, being a 'team' requires that the group exhibit at least the following four specific attributes (after Reilly and Jones, 1974):

- Members have shared goals or a mutually agreed upon reason for working together
- Members are interdependent (i.e., they need one another's experience, ability, and commitment in order to arrive at those mutual goals).

- Members are committed to the idea that working together leads to more effective decisions.
- Members are accountable as a functional unit within a larger organizational context.

In the Water Quality Team, we have modified and interpreted those goals to form our framework; they help us improve academic performance (e.g., more effective learning, more well rounded professionals). They also improve both the marketability and the professional effectiveness of our graduates. All

members of the Water Quality Team have individual goals (e.g., completing our education, advancing our professional development, becoming more effective in their personal and professional lives). There is interdependence in the sense that we all recognize that we continually function in group settings and that we can improve our skills in such settings by learning and practicing in the same setting. We need each other to accomplish our goals. We share accountability for each person's professional development and success, and for collaborative projects.

However, we depart significantly from the business adaptation of the formal team. Our accountability (especially in academic settings like classes and theses) remains individual. We rarely have a collective product. Therefore, ours is a modified approach to team dynamics.

We use a series of tools (e.g., peer coaching, mentoring, collaboration) to strengthen our interaction. As a result, our graduates are more attractive to employers and more effective in the workplace.

Being Part of the Water Quality Team: Optimizing Your Experience

Our adaptation of the team approach is described in detail in Perry *et al.* (1998) and Davis, Perry and Delmont (1999)¹ and is detailed here. *The Brown Book* is a resource intended to help team members optimize their experience (as well as to inform those who might consider joining the Team). This document is evolutionary; it is revised every couple of years. It reflects my views at the time of writing and those of many of the students who have been part of the Team in recent years. It is intended to provide you with an introduction to the Team and its logic and to offer guidance about how to excel as part of the Water Quality Team and one of my advisees. As you will quickly recognize, it is written from the perspective of the advisor; student perspectives are woven in as much as possible.

Much of my approach to advising and much of

the team implementation is implicit rather than explicit. I want you to think and experiment, grow and learn, essential elements of your education and your professional environment. You can do these things effectively only by taking risks. I feel strongly that I cannot ask you to take risks unless I offer you some protection from disaster and some reward for risk-taking. *The Brown Book* is one attempt to offer some of that guidance and protection. I strongly encourage your feedback about, and discussion of the ideas offered here. Each year, you will write an annual report (Appendix A); you and I will discuss your accomplishments, your expectations of me and of the Team. We have a Team retreat about once a year wherein we discuss Team performance. Further, I feel strongly that you will learn more from your fellow Team members than from many other sources. Rely on them for guidance and to serve as a sounding board as you grow and experiment. Use those and other avenues to help optimal this experience.

As you consider your professional and personal growth and your role in the Team, I encourage you to take time to be reflective; carefully consider three central questions:

- Where you want to be, professionally,

¹ Davis, P., JA Perry and T Delmont. 1999

The Minnesota Team Based Approach to Graduate Education: Employers' Perspectives. to *Journal of Excellence in College Teaching* 9: 105-119

Perry, JA, S Anderson, P Davis and J Bryson 1998 A Team-based approach to graduate education. In Strachan, P and B. Clark (ed.s) *Managing Green Teams* Chapter 3: 48-60

- in five years?
- What will you do in the next 12 months to accomplish that?
 - How can I, as your advisor and employer help in those 12 months?

A very valuable resource to assist you in that reflection is *Thriving through the experience*, www1.umn.edu/mnwomen/TTTE.html a workbook that helps you consider life's directions and decisions.

Christine Vatovec, MS Conservation Biology, 2000-2002

I have found the team first and foremost a great place to find a bigger perspective on how my own research relates to water quality issues in an interdisciplinary framework. My research deals with finding ecological controls of agricultural weeds using mycorrhizal fungi, and in the big picture will contribute to landscape sustainability and a decreased reliance on synthetic pesticides in farming. I find the team to be a valuable source of intellectual support as I work toward my degree, and believe that the interpersonal skills we practice will provide me with much needed experience when I join the "real-world" work force.

Christine's Master's thesis used mycorrhizal fungi as a way to increase crop resistance to weeds and reduce environmental impacts of agriculture. After graduation, she worked in an NGO in Washington and will enter a Ph.D. program in Fall 2004

Choosing Team members

I work best with people who are quick studies, energetic and quick to grasp new ideas. I seek to advise broad-thinking students who are motivated self starters and who are (or wish to become) interdisciplinary. I collaborate with a wide variety of other faculty and students; much of my work is international and with international students. I encourage a very

diverse learning atmosphere that is both highly informal and highly interactive. That gives you great opportunity if you are a person who feels comfortable in a self-directed environment. If you feel more comfortable in a more structured environment, please be sure to investigate us carefully; try to understand what I and the Team can offer and where we are limited in our offerings to you.

I view the Water Quality Team as an avenue for personal growth and career enhancement. Communication and leadership skills are learned behaviors; this is an opportunity for you to explore and develop those skills as you grow in your discipline. Students wishing to enter academia and those interested in influencing societal decisions about natural resource management will enjoy participating in this program. At the moment, about two thirds of my students are in Ph.D. programs and the remainder are in Master's programs. Students pursuing Ph.D. degrees as part of the Team generally plan on teaching or furthering a career in governmental decision-making and policy implementation. That includes service as a consultant or with an international or national governmental agency. Students pursuing a Master's degree usually plan to become water resource or environmental professionals, often in a scientific or managerial capacity. Approximately two-thirds of my students gain employment with state or federal government agencies, watershed districts, NGO's, consulting firms, or similar organizations. The remaining one-third pursues academic posts. Many of my students join the team and complete degrees while continuing their employment (e.g., with a state or federal agency, a watershed district or a private company). Many Team members include an international experience as part of their professional growth (e.g., Peace Corps, a study-abroad opportunity, joining us from their home outside the U.S., conducting their research in

another country).

Kathy Draeger, Ph.D. WRS 2001

As an off-campus based student, the Team was very valuable to me as a way to connect with the University and graduate student community. The human resource topics were very interesting and added an enjoyable exercise in extra-academic professional life. I continue to be interested in, and use the information I learned in the meetings (e.g., neuro-linguistic programming). If you are an off-campus student, I strongly encourage you to attend all the meetings and to invest in the connection with your peers and Jim on a regular basis.

Kathy came to the Team 5 years after finishing her M.S. in Soil Science. She was running her own thriving environmental consulting business and in 1997 began by taking a single class each quarter. Upon receiving a Bush Leadership Fellowship in 1999, she returned to school full time and added a newborn baby (Alma) to the mix. Her research looked at nearly 80 watershed organizations in Minnesota; her resulting thesis is entitled *Defining and Evaluating Watershed Organizational Effectiveness*.

Advisor-student interaction

Approximately 8 Ph.D. and 35 Master's students have graduated from the University under my guidance since 1982; about one-third of those participated after the formation of the Team approach. Of those, the happiest and most successful approached their academic careers with creativity, balancing my guidance and their self-direction. They excelled in an iterative, energetic and self-paced environment. They learned well from me and from their peer students. My feedback style tends toward the implicit rather than the explicit, a style that can prove highly motivating if it meets your needs for independence as a student. A few less-satisfied students have successfully completed their graduate program and been associated with the Team; those people required closer guidance and counseling, extensive personal interaction, and some significant degree of negative or correctional feedback. They did graduate successfully but were not as happy with their graduate experience as other students have been.

Rachel Walker, Ph.D. WRS 2000-05

All of us are Jim's advisees, but by meeting together under the umbrella of a team, attending workshops and seminars that challenge us to know how teams work within and beyond the academic world, my graduate experience is richer. The team experience complements the academic training I receive in my program: I've learned from workshops that help us develop communication, self-awareness and writing skills. I've developed better relationships with my peers in the team who are practicing the same skills.

Rachel lived in Hong Kong, Vietnam, China and Taiwan from 1991-98. She received her Master's in Asian Studies with a minor in Natural Resources from Cornell University. She is studying growth dynamics of wild rice in northern Minnesota, asking questions about stable limit theories, nutrient limitation and how Native American communities understand and use such a variable resource .

I believe strongly in combining coaching and empowerment in my model of guidance. As a student, you will be given far more opportunities than you will have time to pursue; these will provide opportunities for you to learn to choose from several competing opportunities and to learn responsibility and personal limits. Declining opportunities on occasion is expected, but that should be balanced with the expectation for high productivity. You will be able to judge both expectation and your performance on the basis of feedback from me and from other Team members, from your participation in Team meetings where we discuss overall Team performance, and from your individual contributions to our collective enterprise.

You are joining a Team (i.e., together we are developing and implementing a team-based educational model). At the core of that model

lies explicit guidance in human resources and peer learning. In this Team, we emphasize development of communication and other leadership skills. I serve as leader of the Team; I require that all my students and professional staff participate in our team-based efforts and believe that this involvement will positively impact each person's educational and professional growth. That growth will come partly from formal training and partly from experiential learning. Each member brings unique resources and capabilities to our interaction and our team-based model is always evolving. Before you decide to join the Water Quality Team, discuss the team and my advising style with current and former team members. Talk with at least three. Elicit the opinions of students similar to and different from you in temperament and learning style.

The following guidelines and expectations for each role in the Team, including thoughts on authorship, committee management, and other requirements are intended to help guide you in refining your questions. These will not provide concrete solutions to problems you might encounter, but they will be useful in helping you and I decide where and how to take the next few steps.

I strongly encourage current and prospective students to discuss their experiences with each other. Try to learn what other people have experienced as they considered entering the Team and after they arrived. What has made the experience most and least successful for people? You can find contact information for current Team members on our web site <http://www.cnr.umn.edu/wq>

Asah Stanley, MS Student 2000-2002

Most of my friends that have graduated and are in the work force often wonder why they had to take as many courses as they did in their respective disciplines while in school. Their argument is that a relatively small fraction of total course knowledge acquired while in school is actually employed in their jobs. However, they do acknowledge the fact that their major challenge is working with people. They often comment about their boss and/or peers/colleagues as being their major challenge. It is obvious that in today's world, knowing how to work with people could make the difference between excellence and mediocrity. In the Team, I have the opportunity to develop these human resources skills; I am successfully taking advantage of those opportunities. I have the opportunity as well, to be coached by team peers who also serve as my mentors. That growth, as well as the team's training, dynamics and collaboration on leadership, communication and creativity all make my professional and real life much easier. The enthusiasm and motivation of the team members reminds me of my soccer days. The only difference is that this time I have to use less muscle and more brain. My greatest challenge here, just like in soccer is the privilege to take risk and the reward for doing so. I often wonder how much risk is worth taking.

Asah is a world class soccer player from Cameroon who gave up obvious fame and fortune to join the Water Quality Team. He has an interesting approach to education; he is extremely dedicated, classy and hard-working.

UROP Student

Caveat: This generic guidance will provide ideas and suggestions. I will develop a specific structure and interaction specifically with you, based on your individual and project needs.

Of the ~25 UROP students with whom I have worked, the most successful have published their research results (e.g., in the *Journal of the Minnesota Academy of Science*), have presented their work at state and regional professional meetings (e.g., Minnesota Academy of Science, Minnesota Chapter of the American Fisheries Society), and have attended and presented at the National Conference for Undergraduate Research. The least successful have struggled to define their questions, have tried a wide variety of things, and have given up with no product but significant learning. Obviously, a range of experience and possibility lies between these two poles.

You will have funding for and should budget a minimum of 10 hours per week for approximately one semester for a UROP project.

Approximate Structure²

***1** Express interest in writing a UROP proposal; speak with other UROP students and the College UROP Coordinator.

2 Write and revise a question. I can offer you models from former students and short abstracts of potential UROP proposals that will be useful as a starting point for ideas.

***3** Work with me to develop and submit a proposal; expect to develop at least three drafts before submission. Allow lots of time for re-writing. It will be very important for us to discuss intended statistical analyses during this phase to ensure that your experimental design allows you to answer your questions.

***4** Upon receiving funding, discuss with me how we will implement the project. Express your commitment to achieving our goals.

5 Collect data as proposed.

***6** Discuss progress and any needed changes; there will be a need to re-think the design and change things after we have made initial progress.

***7** Conduct appropriate laboratory analyses; store your data in some form of spreadsheet. It will be very important for us to discuss intended statistical analyses again before you develop your data storage spreadsheet structure.

8 Do appropriate statistical analyses

***9** Discuss the results and what we think they mean

10 Write a draft of your final report; expect a paper of 10-15 pages in standard Introduction, Methods, Results, Discussion format.

²* **A personal meeting/discussion with me is required at each starred step**

Undergraduate Honors Student³

Caveat: This generic guidance will provide ideas and suggestions. I will develop a specific structure and interaction for each student based on individual and project needs.

Our NRES Honors program is relatively new. I have worked with one person as she completed her honors thesis. Her manuscript is in press in the *Journal of the Minnesota Academy of Science*. The Honors Program requires that you complete the undergraduate curriculum, enroll in Upper Division Honors and then complete at least two semesters' research effort. Plan a minimum of fifteen hours per week for thesis work during those two semesters.

Approximate Structure

- 1** Complete your Lower Division Honors class-work and apply for Upper Division Honors status.
- 2** Develop a question of interest to you. I can offer the most help if your thesis question falls in my areas of interest (e.g., water quality, aquatic ecology, environmental decision making). I am willing, however, to discuss many ideas.
- *3** Revise and narrow the question.
- 4** Conduct a literature review of your chosen topic. A review should cover the most recent literature. It should be synthetic, comparing views of different authors, seeking common themes and finding informational gaps. Write your review as a paper of approximately six pages, double-spaced. It should begin and end with a paragraph that clearly presents your research question.

As part of this process, develop an understanding of where work like yours is published. You will want to consider this as potential outlets for your work (Step 18)

Provide me with a completed literature review at least 2 weeks before step 5.

***5** Meet to discuss your literature review and our next steps.

6 Develop an experimental design and methods to address your question. It will be very important for us to discuss intended statistical analyses at this stage, to ensure that your experimental design will allow you to address your question. This step will result in draft of approximately four pages.

***7** Revise as necessary.

8 Collect appropriate field data.

***9** Meet with me at least three times during data collection to discuss progress and any needed changes in methods or design.

10 Conduct laboratory analyses.

***11** Re-design your statistical approach as necessary after preliminary data analysis. Based on this, generate a two-page discussion of the re-design and the needs for it.

12 Complete statistical analyses.

***13** Provide me with a preliminary draft (~4 pages) of your analytical results.

14 Write a draft of your thesis at least 2 weeks before step 15.

***15** Discuss draft.

16 Re-draft thesis. You may have to develop additional draft(s) beyond this step.

17 Give your Honors seminar (about 45 minutes plus questions followed by a defense).

***18** Refine your final paper into a publishable manuscript.

³*A personal meeting/discussion with me is required at each starred step

Master's Student

Caveat: This generic guidance will provide ideas and suggestions. I will develop a specific structure and interaction for each student based on individual and project needs and on your learning style.

A Master's thesis must analyze a clear and meaningful question. This (usually) data-intensive analysis may be more descriptive than experimental. Your final paper must communicate to a clearly defined audience beyond your committee in order for it to be useful. In most cases, that means a manuscript submitted to a journal. I have advised more than 30 Master's students. My students may major in Water Resource Science, Conservation Biology (including the Fisheries and Aquatic Biology Track), or Natural Resource Science and Management. You and I will discuss your academic and professional history, your specific professional intentions and then will develop a structure that best meets your individual needs.

Individual practices and programs vary widely among students. Some people will have to fill in missing areas from their Bachelor's degree if they enter water quality from a different field. Others may already have completed some of the core requirements in their undergraduate career. If you took a class an undergraduate, and that class is a core or required class in your graduate program, usually you do not have to re-take the class(es). But will need to take a different class(es) to fulfill the total credit requirement.

Graduate school is intentionally a rigorous experience. Most full-time graduate students succeed by taking two classes per semester. At that rate, a Master's program will require approximately 2½ years of full-time work beyond the Bachelor's degree. That varies quite a bit among students.

Jesse Anderson, MS WRS 1997

Being a member of the Water Quality Team was a great asset during my college career. I had the opportunity to learn several skills that helped me succeed at the graduate level, and beyond. We honed our new skills in an atmosphere that was productive, yet informal enough for us all to develop friendships.

Jesse entered the MS program from St. Olaf University, completed a thesis on contaminant dynamics in the Upper Mississippi and is now Regional Water Quality Scientist for the Minnesota Pollution Control Agency, Duluth

Approximate Structure⁴

Classes

1 Fulfill the requirements of your curriculum. For example, WRS students must complete at minimum the four core classes, a water quality class, two water related technical electives and two supporting classes, in addition to their theses. The Graduate School requires all Master's students complete at least 20 credits of class-work in addition to a thesis (more class credits but no thesis for a Plan B program).

2 All water quality students need a basic understanding of, and at least some skill in statistics. You should plan to take Stat 5021 unless you have already had a similar class. About half of our Water Quality Team Master's students also take another statistics class such as Applied Regression (Stat 5603).

Research

1 Identify a question of interest to you. Often, you will be presented with a question because I wrote a proposal to generate your funding. In that case, it becomes your responsibility to refine that question into something that a) satisfies the granting agency, b) addresses an area of interest to both you and me, and c) will serve as a valid thesis topic. If you are funded as an RA, you will want to become familiar with the Research Assistant information (below).

***2** Discuss your re-drafted question, then re-draft again.

3 Read enough of the literature that you clearly understand the opportunities and limitations of the questions posed and the budget available

4 Design appropriate experimental design and methods to address your question (probably a 6-8-page draft).

***5** Revise as necessary.

6 With my guidance, develop a committee of three faculty members, a degree program describing the classes you will take and a

research proposal. You should plan to hold a committee meeting to discuss all that mid-way through your second semester.

7 After that committee meeting, when all have approved of your classwork, file a degree program. That form (available on the Grad School web site) must be signed by your advisor and the DGS, and then filed with the Graduate School.

8 Collect appropriate field data

9 Conduct appropriate laboratory analyses of early samples.

10 Prepare interim reports of findings as appropriate.

***11** Meet approximately twice during the first season's data collection to discuss progress and any needed changes in methods or design.

12 Conduct appropriate laboratory analyses

13 Conduct preliminary statistical analyses of your data to date (e.g., at the end of the first year).

14 Continue statistical analyses and literature review during the intervening period (e.g., 6-9 month) between consecutive data collection seasons.

15 Prepare a summary report for your Committee (see more information on Committee selection and management below).

16 Collect appropriate field data (e.g., during a second field season).

17 Conduct appropriate laboratory analyses

18 Prepare interim reports of your findings as appropriate.

***19** Meet at least twice but as often as necessary during the second season's data collection to discuss progress.

20 Conduct statistical analyses of data.

***21** Discuss a summary of statistical analyses and the major things they seem to suggest.

22 Complete the statistical analyses after our discussion.

23 Provide me with a preliminary draft of your entire thesis at least two weeks before step 24 (in some cases, it will be preferable to review sections as you proceed).

***24** Meet with me to discuss the draft; expect many comments, both substantive and editorial. We will meet as often as necessary.

^{4*} **A personal meeting/discussion with me is required at each starred step**

25 Re-draft your thesis.

26 I will review that draft and offer more comments.

27 Revise again; expect your third draft to go to your Committee.

***28** Prepare a thesis seminar and present it to the Team in a practice session.

***29** Present your final seminar and defend your thesis (or your Plan B paper and final oral exam); if all goes well, you can expect your Committee members to sign the final form at the conclusion of the defense. Approximately 80% of Master's students are far enough along to have their defense form signed at the time of the defense. All have final corrections to make after the defense. Your graduation is official only when I have signed the cover of your thesis and it has been delivered to the library.

30 Revise your thesis based on the final defense and the comments from your Committee.

***31** I can sign your thesis ONLY when all changes have been made.

32 Present a hard bound copy of your thesis to me (and the WRS office or other program office if appropriate), and an unbound one to the Graduate School.

33 Prepare the final manuscript(s) for submission to journals and prepare yourself for the (seemingly endless) process of review and revision.

Ph.D. Student

Caveat: This generic guidance will provide ideas and suggestions. I will develop a specific structure and interaction for each student based on individual and project needs.

Attaining the Ph.D. degree marks the pinnacle of academic training. I have advised more than 10 Ph.D. students. My students may major in Water Resource Science, Conservation Biology (including the Fisheries and Aquatic Biology track), or Natural Resource Science and Management. Each Ph.D. program is unique. Based on experience, however, I offer a few thoughts about overall guidance.

Your dissertation must be an original contribution to science, to management, and/or to your field as it is defined. It must thoroughly and creatively analyze a clear and meaningful question. A Ph.D. dissertation, more synthetic and analytical than a Master's thesis, also delivers more inferential power than a Master's thesis. It does not necessarily, however, contain a larger data set: doctoral research should take science further through thought and analysis, not greater descriptive power.

The Ph.D., a research degree, is intended for those seeking careers such as academia, government, industry, an NGO or consulting and whose talents and those whose aspirations require this highest degree. The Ph.D. dissertation communicates to a clearly defined audience; target your dissertation as three-to-five manuscripts submitted to refereed journals.

Scholars usually enter the Ph.D. program after completing a Master's degree. Some enter directly from the Bachelor's. In that case, I strongly recommend that you complete the requirements for the Master's degree during your Ph.D. track and that you use 1-2 of your final Ph.D. manuscripts as a Master's thesis. This step will require little additional effort but will offer a valuable emotional and intellectual accomplishment.

A Ph.D. program will require approximately 3 ½ years of full-time work beyond the Master's degree, although that time frame varies widely among people. Most full-time graduate students will succeed by taking two classes per semester, although that also varies.

Approximate Structure⁵

Classes

Fulfill the requirements of your curriculum. In most programs, Ph.D. students must complete class-work at least equivalent to that required for the Master's degree (see information above).

1 The Graduate School requires that each Ph.D. student have at least 12 credits of class-work in a supporting program in addition to programmatic requirements.

2 All water quality students need a basic understanding of, and at least some skill in statistics. You should plan to take Stat 5021 unless you have already had a similar class. Probably, you will want to follow that with the Applied Regression class (Stat 5603). After that, you may wish to choose among the following for a third statistics class, listed in order of probable utility to water quality students: Multivariate Analysis, Nonparametric Analysis, Experimental Design.

Research

3 The process of developing and refining a dissertation topic varies too widely among students to conform to a generic structure. Basically, the Ph.D. will follow the structure of the Master's research program, but will be more interactive (between you and me), more iterative and will involve a more in-depth development of the literature and the question being posed.

⁵*A personal meeting/discussion with me is required at each starred step

Post-Doctoral Scientist

The structure for each Post-Doctoral Scientist position will be determined by the funding source(s) and the goals of those involved. In general, I expect the following:

A Post-Doc position is a professional position in which you gain advanced training, skill and experience. It provides opportunities for career preparation and career advancement. Use the considerable flexibility of the position to advance your career objective. Co-author a minimum of two refereed publications per Post-Doc per year. Plan to be the lead author of at least one.

I, and others working with you, must understand this position as a career step, not as a permanent position. Please communicate well with us before applying for positions that might cause you to leave before the funded activity is completed. Avail yourself of career opportunities without assuming contractual obligation to the Post-Doc position.

Lorin Hatch, Post Doc and Assistant Professor, 1998-2002

The team concept has the greatest appeal/potential to me to serve as a forum to learn personal/group skills one will encounter in the working world. Academia prepares us with technical skills/knowledge, but oftentimes the only formal "training" students get in interpersonal communication is a standardized rhetoric class for a semester. The ability to interact with people who are knowledgeable and unknowledgeable is critical to getting water quality programs/projects moving forward in any job situation.

Lorin is an aquatic ecologist who joined us to work on the Minnesota River Project. He has written numerous successful proposals, developed and taught new classes, taught the water quality class several times and published several papers in his 5-year tenure at Minnesota. He left the Team to become a professor at Macalster

Research Assistantship

Research Assistants are hired on funded projects. Your acceptance of those funds represents an obligation to me and to the University. As an RA, you will collect and analyze data, develop reports and manage funds. The level of your responsibility will depend on your skills and experience, as well as the dynamics of the project in which you are involved.

I think it is absolutely essential that you fully understand the responsibilities you assume when you accept an RA. You will hear stories about people not knowing the source of their funds, the probability of their continuation, and the requirements associated. Do not fall into that trap; be careful to ask questions and learn answers.

Budget management

Increased authority and increased degree of control bring increased fiscal responsibility. You will have a level of budget responsibility based on your position in the project. Be sure that your responsibilities are clearly understood and agreed upon. Only accept responsibility for actions over which you have control.

Reporting

Expect some reporting responsibility. Typically, a progress report will be presented to the funding agency every six months. You will prepare the required reports, I will review them and we will submit them together. In most cases, as the PI, I will be the signatory on the progress reports.

Programmatic flexibility

Recognize that accepting funds as an RA obligates you to fulfill the expectations of the granting agency. In most cases, those expectations are (or can be) met flexibly. That flexibility represents your opportunity to insert your own views and to optimize a situation for your own ends.

Teaching Assistantship

Teaching assistants are hired on a semester basis to assist in a specific class. A TA-ship provides you an opportunity to broaden your experience and skills and to increase your marketability. Usually, a TA position does not increase in level of support. During the semester you are teaching, TA funds usually replace RA funds.

You are eligible to become a TA after you have taken the class under consideration. In my Department Head role, I send an announcement to each faculty member each Spring, asking them if they require a TA and, if so, to justify that request. In the same way, I invite each graduate student in the department to apply for TA positions, asking them to identify the class for which they would like to TA and the

reasons they feel they would be a good choice for that class. Many variables play a role in my decisions about whom to select and the class to which they are assigned. Usually enrollment in the water quality class is high enough to warrant a TA (i.e., >35). For that position, I will select the person from the department whom I believe will provide the students in the class with the best experience. Often that person is a member of the Team. That may provide you opportunity if you find it interesting.

If you are selected as TA for the water quality class, your responsibilities will include:

- 1 Reviewing the syllabus at least twice and helping me re-draft it. Syllabi and class structure are revised each time I teach.

2 A central role in grading, especially in writing and grading tests.

3 Attending all class sessions and leading some exercises.

4 Developing and/or revising some exercises.

5 If you are a Ph.D. student, recognize that serving as a TA is viewed as a routine and expected function when you apply for positions. It will prove valuable 2-3 times; more than that adds relatively little to your suite of skills or to your marketability. Obtaining a position where you have full control of a class carries a great deal of weight with a search committee and greatly increases your skills. I can discuss such opportunities as you become interested.

Authorship

Water Quality Team members work collaboratively. As your advisor, mentor and employer, I expect to contribute to your work through ideas, money, encouragement, guidance, institutional empowerment, review, re-direction, editing and writing. Thus, you will include me as an author on essentially all published and presented products that emanate from your work here. In general, I will be second author when you present something you have developed and led. I will be lead author and will list you as co-author on products that

I develop and lead, to which you contributed significantly (data, analyzing, interpreting, writing).

You will have many chances to contribute to larger, multi-authored works: I am a highly interdisciplinary person and I work with many people. Usually, one person leads the development writing and takes the role the lead author. Other authors are listed alphabetically after that person.

Managing your Advisor

To assist you in managing me as your advisor, I suggest you consider these suggestions:

1 Stay in contact. Provide routine updates about your career interests, your professional development, your classwork and research; in general, be sure that your advisor(s) know how things are going. I stress this suggestion. Send frequent messages, arrange frequent visits and updates. You will feel more involved and you will get better guidance (and I will have more fun).

2 Recognize that I am a tool useful in advancing your professional interests, broadly speaking. I am interested in filling that role and regard it as a core part of my responsibilities. In the same way, you should ensure that we both feel that you are advancing interested in and are working to advance mine. Study your advisor and attempt to learn about those implicit goals. Strive to identify ways you can contribute to my objectives while advancing your own.

3 I am, and I want you to be (but will not require that you be), highly interdisciplinary and interactive. Human resource skills are central to your success in graduate school, to your success in marketing yourself as you leave graduate school, and to your success in your professional and personal life. I expect you to learn those skills and to hone them continually.

4 I believe very strongly in the multicultural and international nature of our field and of our work. You will be more successful if you can develop and demonstrate interest in cultural diversity. You will have chances to advance that here at home and through international work. If you can demonstrate that you are a world citizen through attitude, focus and international work, you will be more capable and more marketable.

Managing your Committee

You do not need a Committee if you are a UROP student. Your Honors or Master's committee will consist of me, one person from your major discipline (e.g., WRS, Conservation Biology) and a third person from another field. Your Ph.D. committee will consist of three people from your major and one or two from outside (WRS requires five committee members, most other programs require four). Because some fields (e.g., WRS) are highly interdisciplinary, your outside person may actually hold an appointment on the WRS faculty. To be considered an outside person, s/he must be from a distinctly different subset of WRS and must hold a graduate appointment in at least one program outside WRS.

Other Team members, peer students, your class-work experiences and I will be invaluable for advice and information regarding committee members. Choose your committee members early in the second semester of your program. Invite only those individuals to take part in your committee whose professional background pertains to your work. Schedule your first committee meeting late in your second semester. Subsequent committee meetings should be held approximately every 7-9 months. Cite and refer to your committee members' relevant work in your study plan and in the development and reporting of your research. When you present your thesis, your committee members will ask themselves if you know of their work. If you cannot find relevant and honest ways to cite the work of a committee member, get a different committee member.

An exemplary structure for interacting with your committee is as follows (this is modeled for people who begin in September and will vary among people):

March-April of first academic year: Present an overview of your academic and personal background (including undergraduate transcripts), career aspirations, intended classes, research question, experimental design, methods, preliminary data if available.

October of second academic year: Present an overview of your first field experience and data collection, preliminary analyses of data to date, any changes in design and a discussion of why they are needed, any intended changes in your class-work.

March-April of second year: Present an overview of your full data set, a detailed discussion of intended statistical analyses and clearly demonstrate that those analyses will allow you to address the question you have posed.

June-September of second year: Present one of the following: 'Here is my status and these are the questions on which I would like your assistance' or 'Here is my thesis and I am ready to defend'.

(Note: this is most appropriate for a Master's student. Ph.D. students should follow the same logic but the details will vary widely.)

Additional Requirements

Being my advisee, a member of the Water Quality Team and part of at least one academic curriculum carries specific additional requirements of which you should be aware:

'Ethics' training: The Graduate School

requires that each graduate program implement an ethics course. These courses vary among programs but usually require about two 2-hour sessions per semester. These are required sessions and failure to participate will disallow graduation. I, and

many others feel this is framed much too narrowly and should be called Responsible Professional Behavior. You should seek opportunities to engage in discussions about issues like authorship, data cleansing, data management, plagiarism, harassment, advisor-student relationships and many other topics. This is one of the few times in your life when there will be time and energy explicitly devoted to these discussions; enjoy them.

The Water Quality Team: As the team-based approach evolves, so do expectations. To the degree that a formal team exists and offers human resource training, that training is required of all of us. The Team also represents a resource through which you learn about and learn from peer students. **Team meetings are not optional; when you agreed to join the Team, you explicitly agreed to participate fully. That full participation is required.** Team meetings and other functions are held specifically to advance our learning and are designed to benefit us all. That benefit may accumulate slowly but will make a difference in your professional growth. You are expected to participate in the overall graduate program and in the team. The team-based approach offers an avenue through which each person can contribute skills and can achieve recognition. Work with me to identify a specific area in which you can contribute and for which you can achieve a sense of satisfaction.

Give something back: I feel strongly that we have an obligation to do something that makes society a better place, that contributes to a sustainable human existence on earth. A core part of that belief rests in my feeling that a sense of community is one of the most significant variables that control each our successes. I expect that each member of the Team to find an opportunity to make a personal contribution to our society at least on an annual basis. This contribution should be based in your professional growth; it need not replace your contribution to your church or volunteer organization, but it should be professional. This contribution might be taking the opportunity to teach a High School teacher how to conduct a class in water quality or applied ecology, a chance to participate in the Jason Project through the Bell Museum or any of many other forms.

So, I repeat, welcome to the Team. I am delighted to have you consider joining us. We are a very exciting group and we will be delighted to have you join us. Please help us make this effort successful.

Appendix A Request for annual report

Good Morning December 9, 2003

I ask that each person in the Water Quality Team write a short Annual Report. I will appreciate receiving your report by 31 December. It will serve two purposes: I will use the information you give me to pass along to the Dean. That will increase the probability of there being more resources available to us in the following year. I also will use that information to tell others in the Team and outside the Team about the kinds (and quantities) of things we do. Of course, you could also use the composite report in your efforts (e.g., in marketing or proposals).

In framing your report, you might wish to reflect on the Team logic and the operating metric that you agreed to adopt and implement when you joined the Team. That is, the Team exists to advance your (our) professional development and performance. We believe that is best done by weaving together human resource skill development and disciplinary education. Every member of the team has agreed to accept three goals. Those goals, in decreasing priority order are:

1. Be an excellent professional, usually interpreted as an excellent graduate student. That means (for the graduate students) taking rigorous classes, maintaining a high GPA (expected to be >3.5), posing rigorous and meaningful research questions, collecting high quality data with known precision, completing solid analyses of those data, making meaningful and scientifically sound interpretations of the results, writing good manuscripts, publishing in good journals, knowing the literature and contributing to its growth, knowing your peers and others who are contributing to the field, networking with them in various settings, growing and functioning as a professional
2. Be an excellent team member, which means participating in all team meetings, interacting with your peers in the team, participating in development and implementation of the human resource skill development aspects of the team
3. At least once pre year, give something back to society. You have been given (and earned) the opportunity to work in an amazing setting. Your position here is well justified by your background, hard work, ethic and intelligence. However, there are many who have not been as fortunate as you. Take some opportunity(ies) to acknowledge that. Teach a high school teacher how to measure water quality, send a child to environmental camp, speak to a church group, whatever you decide is appropriate for you.

I will appreciate it if you will include the following information in the report:

- Classes taught (as instructor or TA)
- Professional meetings attended
- Professional papers presented, including seminars (list as: Author(s), date, title, presented at...)
- Papers submitted for publication, papers accepted, actual citations if they came out (list as Author(s), date, title, outlet)
- Outreach efforts conducted
- Proposals developed and their status (i.e., funded, pending, denied; include fellowship and other such proposals) (list as: Author(s), date, title, sponsor, duration proposed, total dollars)
- Personal professional development (e.g., retreats, workshops, training exercises,

Human Resource skill development including ethics and other such seminars or workshops)

During 2003, there were approximately 20 people associated with the Water Quality Team; some of you soon will be completing your efforts (e.g., a degree finished in 2003 or 2004) or are only partially associated (e.g., on a contract to prepare a paper or do an analysis). In those cases, I am interested only in the activities appropriately associated with the Water Quality Team. For example, your thesis and its manuscripts and seminars are appropriate, as are papers or books you develop outside your thesis work but in association with other Team members. As general guidance, tell me about everything you think might be related. However, you do not need to not include things like seminars, papers, workshops that are part of your “extra-UMn” professional life. Please discuss this with me if it is confusing.

I greatly appreciate your assistance. This small effort will make a major difference in our ability to convince people we are unique in our ability to help you gain knowledge, skills and abilities to excel when you leave here (as well as while you are associated with the Team).

By way of example, the following section includes the accumulated annual reports from all team members for 2003

Water Quality Team 2003 Annual reports

Synthesis

The Water Quality Team consists of a group of students working together and working with Jim. The logic of the Team as a *team* (i.e., as distinct from a research group) is that we attempt to explicitly weave together disciplinary professional development and human resource skill development. Each person explicitly agrees to three overall generic goals upon becoming a member of the Team. Those three are I) function as a very strong, growing scholar (i.e., take good classes, maintain a high GPA, frame rigorous research questions, collect precise and accurate data, analyse those data well, invest heavily in interpretation of those analyses, publish your work in good journals, write sound proposals for further work), II) be a committed and active Team member (i.e., fully participate in Team meetings, take full part in the human resource skill development) and III) at least once per year, give something back to society.

During 2003, there were 20 people associated with the Team. Each person was asked to submit an annual report that addressed six issues. The following synthesis (**to be added**) addresses the contributions of all 20 members.

- *Classes taught (as instructor or TA)*
- *Professional meetings attended*
- *Professional papers presented, including seminars*
- *Papers submitted for publication, papers accepted, actual citations if they came out*
- *Outreach efforts conducted*
- *Proposals developed and their status (i.e., funded, pending, denied)*
- *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops)*

Stanley Asah**December 22, 2003***Classes taught (as instructor or TA)*

Spring 2003 and Fall 2003: NRES 4061 Water Quality Management

Professional meetings attended

Summer 2003: Conservation biology conference

Professional papers presented, including seminars

Summer 2003: Stoichiometry of detritus and detritivore resource ratio preferences: Implications for species conservation. At the Conservation Biology conference.

Outreach efforts conducted

Soccer coach for the Minnesota International students soccer team: Made it to the first round of playoffs

Soccer coach for the Liberian Immigrant soccer Team. Ongoing in two separate leagues

Proposals developed

Integrating Local Socio-ecological Systems in Transboundary Water Management. Submitted to the Agriculture for Peace Fellowship for Sub Saharan Africa. Pending.

Personal professional development

Team weekly workshops on research design and human resource development

Communication and leadership weekly workshops with Toastmasters international

Non profit management training workshop, as GAPSA Executive Vice President

Claire**December 31, 2003**◆ *Classes taught (as instructor or TA)***Ethics and Leadership in Resource Management**◆ *Research Assistantship*

Working with Len Ferrington. We are studying macroinvertebrates as water quality indicators for Wetlands.

◆ *Scholarships*

Charlie Reimer Scholarship

◆ *Professional meetings attended*

North American Diatoms Symposium

◆ *Professional papers presented, including seminars*

Miocene Diatoms in Ashfalls Nebraska

◆ *Papers submitted for publication, papers accepted, actual citations if they came out*

Not yet, work in progress

◆ *Outreach efforts conducted*

Provided French technical support in Conservation Biology and in the French Department

◆ *Proposals developed and their status (i.e., funded, pending, denied)*

Still developing

◆ *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops)*

Lab training

Safety Committee at Aramark

Social Committee

◆ *Extra curricular work*

Attended the Diatoms class at the Iowa Lakeside Laboratory

Dawn**December 20, 2003**

I hope that providing notation under the bullet points is sufficient. You know what each of these things is, but if you'd like more description, let me know.

■ *Classes taught (as TA):*

Water Quality 4061/5061, Spring '03, and Environmental Ethics 3011, Fall '03

■ *Professional meetings attended:*

Annual Meeting of the Society for Conservation Biology, Summer '03

■ *Proposals developed and their status (i.e., funded, pending, denied):*

Fellowship applications: ELP – denied, Dodsall – pending, Alexander & Lydia Anderson – pending, and more applications will be submitted soon.

CDRS/Galapagos National Park Permit Proposal: accepted (no funding)

■ *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops):*

Grant Writing in the Sciences Workshop, Spring '03

Water Quality Team Retreat, Spring '03

TA Web Certification Program 102, Summer '03

Teaching with Writing Seminar, Summer '03

Invasive Species Workshop Fall '03

Numerous presentations, guest lectures, thesis defenses.

This is very brief. Is it sufficient for what you're expecting?

Della Nyondi Schall Young

December 31, 2003

■ *Classes taught (as instructor or TA)*

None

■ *Professional meetings attended*

None

■ *Professional papers presented, including seminars*

None

■ *Papers submitted for publication, papers accepted, actual citations if they came out*

None

■ *Outreach efforts conducted*

None

■ *Proposals developed and their status (i.e., funded, pending, denied)*

A significant amount of my energy has been spent developing a proposal for the Minnehaha Creek Watershed District. They are currently in the process of developing indicators for managing the Painter's Creek watershed. Unfortunately due to work and personal commitments I have not been able to complete my proposal in a timely fashion which leads me to believe that this opportunity may have passed. Nevertheless, I'm going to continue to work with my unassigned team mentor, Stanley Asah, to get a good handle on the proposal writing process while I work to get another client to fund my research.

■ *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops).*

Not applicable, all were part of my professional requirement (job related)

Diane

December 31, 2003

Hi Jim-- Thanks. I have nothing to report as of now.

Edith

December 31, 2003

2003 was a hectic year for me, I had to think of school – sometimes- when I received the Self Loan bills-and the UN job for survival, made many broken promises to Jim Perry, and I think he is fed up with me but hope not because I believe that he has a heart to forgive. We had Millicent Mrema as an intern in GIWA and hope that she gained something from the attachment, including her participation in the International Stockholm Water Week. Attended many workshops and Conferences for implementing GIWA in Sub Saharan Africa which ultimately led to the launching of the first GIWA Reports in the recently completed PAN African Implementation and Partnership

Conference in Addis Ababa, Ethiopia. The PANAFCOM is a prerequisite to the CDS –12 (Conference on Sustainable Development) Conference in the UN, New York in April 2004. Prior to the CDS-12 will be the African Union Meeting of Heads of States in Libya in February 2004 during which time an African Position Paper on Water and Sanitation will be drafted (we shall have a side event of the Launch of the Lake Chad Basin assessment Report and hopefully, the Nile River Assessment). I am happy to have been part of the panel for papers in Thematic 3 of UNEP on Protection of the ecosystem and livelihoods, a session with African journalists on Environment and launching of GIWA Reports from Sub Saharan Africa that was preceded over by the Deputy Director of UNEP and attended by 22 Ministers of water from SSA among other guests. During the Launch, the chairman of the African Council on Ministers of Water – AMCOW, HE, M.S.Shagari of Nigeria, Mme, HE Minister of Water of Uganda, HE Minister of Water and Forestry, South Africa and Mme Minister of Local Government, Zambia spectacularly represented their colleagues at the high table. I was so emotionally overwhelmed, I cried and truly wished to have you share this moment with me! BUT, America and Addis is so far apart. Apart from that I am going to Western Kenya to carry out my research – back as a student of UoM, College of Natural Resources, Water Resources Centre, a place where I know, I can get peace of mind. Thank you and have the most blessed holidays of 2003/2004
Edith Mussukuya

Emily

December 31, 2003

As part of the Water Quality Team in 2003, I worked on a research project titled *Fecal coliform Concentrations in an On-Campus Wetland: The Links to Animal Waste Treatment*. Due to enrollment in an off-campus study program, I was unable to attend group meetings during fall semester, but I look forward to becoming more involved in the spring. I will also continue with my research at this time, hopefully getting it into manuscript format. Below is a brief overview of my research.

Coliform are a type of bacteria present in human and animal fecal excrement. The presence of coliform in aquatic settings indicates that human or animal feces are in the water, which can potentially include pathogens or disease-producing bacteria or viruses. Agricultural runoff is one of the largest contributors to surface and groundwater contamination. During periods of heavy rain, animal wastes are washed into surface waters, making wet periods the most likely time for high coliform levels to occur. This can result in fecal loading of aquatic systems, with contamination exceeding the locally or federally set water quality standards.

It has been shown that large constructed wetlands are useful in the reduction of enteric microorganisms, including coliform. Small-scale constructed wetlands can rely on vegetation to remove microorganisms, but are not as effective as large-scale projects. In my study, water sampling took place at the on-campus Sarita Wetland. There are no mechanisms in place for extensive treatment of water, because the wetland has been used instead for the monitoring of water quality as it relates to various on and off-campus activities.

This project involved the sampling of water at Sarita approximately within two hours of heavy rainfall (designated as greater than 0.50 inches) between May and September 2003. The amount of sampling performed was contingent on funding. Upon collection, the samples were brought to Pace Analytical Labs in Minneapolis for coliform analysis. Once the results were received, the data was analyzed to determine if levels exceed contamination standards, which would indicate problems in agricultural waste management procedures at the University. Six samples were collected and all had fecal coliform levels far exceeding national contamination standards for primary contact, ingestion, and treated public water supplies. This suggests a large-scale presence of animal manure in Sarita. Fecal coliform levels are generally higher in irrigation water than in ground water, but such high concentrations may not be filtered out completely by soil

and sediment before the point of human consumption. More effective methods of animal waste management need to be looked into at the University as a precautionary measure, while analysis of ground water samples would help to clarify the extent of fecal coliform levels as they relate to human health.

Haibo

December 20, 2003

I became a member of the WQ Team at the past fall, and actually deem it the starting point of my hoped-for life-long career of natural resources management. Having been a pure scientific veteran for three years before joining the team, I experienced great transitions both in thinking and working styles in the past semester.

The first thing I did and actually required to do was to make up my deficiency, especially in management sciences. I took the class "Hydrology and Watershed Management" by Ken Brooks, which provided me an integrated perspective and basis for further study. The other course I took was "Environmental Water Chemistry", another required course of WRS, which offered systematic training in a traditional yet basic field, water chemistry. The principle of my future course-taking is to couple them closely to my project and I estimate that I need another 5 courses to satisfy my courses requirement.

The WQ team concentrates on solving the practical problems. Water quality management needs multidisciplinary cooperation. The weekly meeting, a very important feature of our team, provided such an occasion in prepared us for team work. The members' different focuses benefit me greatly in enhancing the horizon. The WQ team should be used as an expert pool: you asked questions and got feedbacks by their diverse expertise. It also provides a stage for enhancing the presentation art. A successful presentation can lead to valuable discussions. One of my ideas is that we should at least know some education or management theories on how to use this small forum - how the presenter and the audience could function for better interactions.

Water quality management is also a practice involving multi-parties: the public, the industries, the agricultural community, the governments, the experts, etc. It's important to understand the stands of all these roles. The professional communications is a good way for this sake and I experienced quite a few professional gatherings in the past semester. Firstly, I was required by my current sponsor NPS, to join the quarter meetings of the St. Croix Basin team, which consists of representatives from NPS, MNPCA, MNDNR, WIDNR, etc. The updates of the current projects on St. Croix River are publicized and new projects are initialized here. These meetings help me understand the concerns of these agencies. Secondly, I presented the 64th Midwest Wildlife and Conservational Biology Conference in Kansas City, Missouri, where I gave an oral presentation of my Master's thesis work, "Satellite Observations of Physical and Biological Observations of the Great Lakes". In the future, I plan to carry out more person-to-person conversations with you, the team members and the St. Croix River community.

As about the Ph.D thesis study, I provide a separate writing here (see the attachment).

Henrique

December 20, 2003

Professional meetings attended

51st North American Benthological Society Meeting, June 2003, Athens, Georgia.

XV International Chironomidae Meeting, August 2003, Minneapolis, Minnesota.

VI Congresso Brasileiro de Ecologia (Brazilian Ecology Meeting), December 2003, Fortaleza, Ceará, Brazil.

Papers Presented on Scientific Meetings

A revision of the Neotropical caddisfly genus *Macronema* (Trichoptera: Hydropsychidae). H. **Paprocki** and R. W. Holzenthal. Presented at the North American Benthological Society Meeting, June 2003, Athens, Georgia.

Análises Preliminares de Estudos de Biodiversidade de Trichoptera (INSECTA) no Sudeste do Brasil Henrique **Paprocki**, Ralph W. Holzenthal, Roger J. Blahnik, Marcelo C. Amarante, Leonard C. Ferrington, & James A. **Perry**. Presented at the VI Brazilian Ecology Meeting

Seminars Presented

Neotropical Trichoptera Biodiversity and its use on biomonitoring of water quality. Presented at the Pontifícia Universidade Católica de Minas Gerais, Brazil. November 2003.

Neotropical Trichoptera Biodiversity and its use on biomonitoring of water quality. Presented at the Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil. November 2003.

Scientific Papers

Published

Paprocki, H. 2003. Insetos Arquitetos. Trichoptera, uma importante ordem de insetos aquáticos praticamente desconhecida no Brasil. *Ciência Hoje*, Brazil, 190, 64-67 p.

Paprocki, H. and R. W. Holzenthal 2003. An unusual new species of *Smicridea* (*Smicridea*) (Trichoptera: Hydropsychidae) from Venezuela and its role in travertine biogenesis: *Journal of the North American Entomological Society*. 22(3):401-409 p.

Paprocki, H., R. W. Holzenthal, R. J. Blahnik, M. C. Amarante, L. C. Ferrington, & J. A. **Perry**. 2003. Análises Preliminares de Estudos de Biodiversidade de Trichoptera (INSECTA) no Sudeste do Brasil. *Proceedings of the VI Brazilian Ecology Meeting*. 148-149 p. (extended abstract).

Submitted

Checklist of the Trichoptera (Insecta) of Brazil. Henrique **Paprocki**, Ralph W. Holzenthal and Roger J. Blahnik. Submitted to *Biota Neotropica*.

Kelsey

December 31, 2003

My name is Kelsey Dahl. I am a sophomore; however, this fall, I transferred to the University of Minnesota College of Natural Resources and I am a freshman in that college. This fall, I applied for an Undergraduate Research Opportunity Program (UROP) (with my faculty sponsor Dr. James Perry) which was funded to continue a very intriguing project. I have been working with Dr. Lyn Hinds in Australia since my freshman year in high school regarding modeling a virus that would make European rabbits sterile/infertile. European rabbits in Australia are declared a pest species and have done much damage to native plants, farmer's crops, and have effected the populations of other native fauna. A virus is very much needed to control these overwhelming rabbit populations.

In the past, I have only been able to model my ideas and viruses on paper, send them to Dr. Hinds, who would work with them. Now that I am at the University of Minnesota, and have received tremendous help from Dr. Perry, my possibilities have expanded greatly and enabling my research to proceed full speed ahead.

During the UROP, we will test the effects of a toxin on Gonadotrophin-releasing hormone (GnRH) neurons. Working with these neurons, electron microscopes, and light microscopy will give me lab experience, furthering my research. The outcome of these experiments will help determine what the species specific "rabbit virus" will be modeled like (a near future project). Also we will be communicating with Dr. Hinds about the virus and its effect on controlling the rabbit population. Over the years, this has been very exciting and continues to be extremely intriguing. I have learned (and had fun) more than I ever thought possible. A project with so many considerations (a species-specific virus, neuroendocrinology, cost effectiveness, etc.) is exuberating to me. I cannot wait to continue to work on this project with Dr. Perry, Dr. Hinds,

through UROP at the University of Minnesota with its many resources!

Kerry

December 31, 2003

Maureen

December 31, 2003

In 2003, I completed two semesters of classes towards my masters degree in Water Resources Science. Over the summer I worked as an intern at the Pollution Control Agency where I sampled wetlands and streams for macroinvertebrates and surveyed wetlands for plant diversity and measured other water quality parameters. In August of 2003 I accepted a position as a research assistant through the University of Minnesota. In this position I am responsible for water quality monitoring at the Sarita Wetland and for analyzing the data that had been previously collected. I will use information gathered from this position to write my Plan B masters paper. I am actively involved in Water Resources Students In Action (WRSIA). I was the social coordinator for WRSIA until September 2003 and then in September I became a co-president of the group. I am also on the Water Resources Science curriculum committee. I attended weekly water quality team meetings and attended the weekly water resources science seminar series. I also attended seminars relevant to my project i.e. Tom Schueler's seminar on stormwater and the University of Minnesota Environmental Health and Safety department's seminar on the University's stormwater management plans. In November I volunteered at the River Summit for the Volunteer Stream Monitoring Partnership.

Millie

December 31, 2003

Hi again,

During the first half of the year Spring 2003, I presented my proposed Thesis Topic to the Water Quality Team. It was thoroughly discussed and comments from the team were added to the proposal. For professional development I attended ethics courses in the Department of Conservation Biology. During Summer I went to Sweden for an attachment at Global International Waters Assessment (GIWA). I worked under the guidance of Edith Mussukuya on the Somali Coastal Current region. In addition I attended the International Stockholm Water Week. During the second half of the year 2003, I concentrated efforts on developing a new proposal, as the original topic had been well analyzed. The new topic was on "Understanding and Managing the Impacts of Developing the Transboundary Water Stressed Ruvuma River Basin". I wrote the proposal and submitted it to the examining committee as part of preliminary exams.

Status to-date: I have completed and passed the written prelim, and am now preparing for the orals to be taken early next year 2004.

Mindy

December 31, 2003

Nicole Benjamin Fink

December 31, 2003

Looking back at the year, it is a little hard to remember all the accomplishments and all the disappointments, not alone to acknowledge them.

In March (July and again in September..) I committed my life to be tied with another. I became Nicole- Benjamin- Fink. My family arrived for the event and was introduced to my life in America. I also spent close to 6 weeks in Israel. Israel survived the war threat from Iraq and all my love ones survived various daily threats. I have managed to maintain and develop my personal relationships with people by phone. And make the people I care about (a little..) proud. I have a 5 month old boxer that is enjoying his personal being and the world surrounding him.

I finished my 2nd and 3rd semester in the U.S in a slightly different state of mind; being exposed to the economic aspects of conservation biology and specific case studies in the departmental seminar expanded my knowledge until a stage that I could almost feel my brain expanding and absorbing with high interest. Learning how to think in a model based way reshaped

my view in almost every aspect of my life.

Parallel to my classes, which included frustration at times, a lot of one on one hours with the dictionary, high level of commitment, professional and spiritual growth, I conducted my field work (March – May), meet with you nearly every week to further understand and better my research and was (am) a newlywed.

I am on the board of Torah-Academy. This is a 1st – 8th grad school. I attend monthly meetings and once every two weeks a 2-3 hour period at the school in which I observe and try to contribute to my best knowledge. I feel that my 4 years of learning various aspects of teaching and psychology have a positive implement.

Further more, I have recently become a member of the board of JNF (Jewish National Funds). I hope to learn about the organization and contribute in a number of ways, including my personal knowledge which is based on insights from living in Israel and Israel's history.

My field work was very time consuming but very rewarding as well. I spent every evening/night inquiring nature's patterns and adaptations to the human's species impact. There were nights in which the rain, wind and bugs reminded me that I'm in MN and there were beautiful clear nights that I stopped to look around and appreciate the moment.

During the last 5 months I have been focusing on finding the optimal statistic way to summarize and explain my data. I have taken a statistical programming class from the stat department, which provided me with sufficient knowledge to be able to present my work in my first national presentation. I attended an introduction to GIS class, which I found to be very useful and amazingly interesting. In addition to these classes I took a seminar which approaches science through questioning its very being. I found that seminar to be very interesting and enlightening. I have a feeling of satisfaction from my grads and mainly from my personal development, which has resulted in a constant (positive) need to grow, absorb and understand.

I have been a member of the water quality team for 3 semesters and find our meetings to be very useful. Team meetings provide a support structure and a convenient way to get peer feedback on my personal work/ ideas and to learn about others. The fact that each member has a different interest and some from different departments, allows one to positively utilization of the social human resource aspect. A few of us have learned about various topics unrelated to the presentation but important for our grad life due to the human resource. I am in the process of forming the team meeting schedule for spring semester. I hope to make it interesting and efficient as possible. Tips on giving public speeches, what to expect when preparing for our defense, active listening and interesting notes about how we should study/research or approach job hunting are among the issues that the team will be exposed to and benefit from.

I have written my first book review. This was a very interesting process, since I learned allot about transboundary conflicts and conservation issues and how to write and submit a book review.

During the week before the last of fall semester, I presented our study at my first national meeting. I found that to be a learning experience, in which I took the "observer" roll and tried to understand and learn the manner of such conferences. I also experienced for the first time, talking to professional individuals as peers (something I have experienced in team meetings, our meetings and Bruce's seminar).

My expectations of the coming year:

Personal

I will continue serving on the JNF board, on the Torah academy board and possibly start volunteering in the US federation.

In parallel to my current work I will be focusing on potential dissertations in Israel. The shift of my focus will be according to date.

Choosing my committee members.

Attending team meetings, taking 2 classes, 1 seminar and toast maters spring semester

Defending my thesis successfully in March

Start volunteering in the wildlife rehabilitation center in April

Graduating in May

Attending a teaching related conference in may

Presenting at the SCB conference in July

In parallel, I will work on my thesis writing.

Taking my prelims in fall/spring.

Complete defining my dissertation focus in October when visiting Israel with you and submitting a proposal within the following 2 weeks.

Rachel

December 20, 2003

Passed written and oral preliminary exams in Spring 2003.

Completed first year field season of National Science Foundation sponsored project on wild rice population dynamics and nutrient cycling in summer 2003.

Trained and worked closely with student from Fond du Lac Tribal College in conjunction with above project.

Attended Annual Meeting of the Society for Conservation Biology, Summer '03

Developed preliminary statistics of data from above project's first summer.

Developed a paper that features model analysis of wild rice population dynamics for submission for publication (finalizing in next month).

Attended workshops sponsored by University of Minnesota Career Services on "How to develop a Curriculum Vitae" and "How to be a better teacher."

Worked about 7 hours a week with kids from North Minneapolis to improve literacy and personal development through after-school activities.

Shannon

December 31, 2003

■ *Classes taught (as instructor or TA)*

None.

■ *Professional meetings attended*

None.

■ *Professional papers presented, including seminars*

None.

■ *Papers submitted for publication, papers accepted, actual citations if they came out*

None.

■ *Outreach efforts conducted*

WRSIA meetings

■ *Proposals developed and their status (i.e., funded, pending, denied)*

None.

■ *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops)*

None.

Kind of makes you wonder what I've been doing with my time doesn't it?

Have a great holiday,

Shannon

Sharon

December 31, 2003

Suzanne

December 31, 2003

■ *Classes taught*

None

■ *Professional meetings attended*

Conservation Biology, Duluth MN, July 2003

Greening of the Campus 5, Ball State Indiana, September 2003

■ *Professional papers presented*

Presentation *Campus Ecology Bridging the Gap Between Campus Sustainability Efforts and Urban Ecology*, Society for Conservation Biology, Duluth MN, July 2003

Poster Savanick, Suzanne and Jim Perry, 2003, *Urban Ecology and the University Campus*, Connecting to Place: Greening of the Campus 5 Conference Proceedings, Ball State, Indiana, Sept 2003.

■ *Papers published*

Savanick, Suzanne and Jim Perry, 2003, *Urban Ecology and the University Campus* in Koester, Robert (ed.), *Connecting to Place: Greening of the Campus 5 Conference Proceedings*, Ball State, Indiana, Sept 2003.

Brijdeep S. Bhasin, Thorunn Bjarnadottir, Varsha N. Das, Maia M. Dock, Emily E. Pullins, Jon R. Rosales, Suzanne Savanick, David M. Stricherz, Lark A. Weller, B.S., 2003, Passport to Earth Summit 2002: A Case Study in Exploring Sustainable Development at the University of Minnesota, *International Journal for Sustainability in Higher Education*, 4(3): 239-249.

■ *Outreach efforts conducted*

University of Texas at Austin, consultant and workshop presenter for National Wildlife Federation, "Campus Ecology", winter 2003.

Winona State University, guest lecturer, "The Campus and the Global Environment Workshop" presented for the Global Studies Program, September 2003.

Impress the President, poster presentation and discussion with the president member, 2003.

Organizing committee member, University of Minnesota Sustainability Summit, April 2003.

■ *Resource skill development*

Ethics and communication class taken, entomology department

Valerie

December 31, 2003

■ *Professional meetings attended*

1. 2003 Society for Conservation Biology in Duluth, Minnesota

2. Midwest Fish and Wildlife Conference in Kansas City, Missouri

■ *Professional papers presented*

Besides the presentation to the team, paper at Midwest F & W.

■ *Outreach efforts conducted*

Active Member of WRSIA as the representative to the Student Faculty Board

Wesley

December 31, 2003

I successfully presented and defended my thesis, "Evaluating the use of in-situ beach sand to protect water quality by filtering stormwater," in May. My thesis was accepted by the Graduate School in October 2003.

As well, I attended two conferences regarding state-wide TMDL issues during the summer. I also applied for status as a Certified Professional in Storm Water Quality.

Jim's year

December 31, 2003

■ *Classes taught*

1. Water Quality: Management of a Natural Resource, NRES 4061 and 5061; Spring semester, with Asah and Dawn.
2. Water Quality: Management of a Natural Resource, NRES 4061 and 5061; Fall semester, with Asah
3. Hydrology and water quality field methods, NRES 5111; Spring semester, with Bill Christner doing the 4111 section
4. Environmental Law, NRES 5480, Fall semester, with Janette Brimmer doing the 3480 section
5. Several directed studies, UROP and Honors students

■ *Professional meetings attended*

1. Society for Conservation Biology, Duluth
2. NCA 23, Upper Midwest Fish and Wildlife Programs, Madison
3. Midwest Fish and Wildlife Conference, Kansas City
4. The First International Water Conference, Fargo
5. Personnel Trends in Natural Resources, Washington DC
6. A Strategy for AID for Africa
7. FAME Frontiers in Assessment and Monitoring of the Environment
8. The Wildlife Society annual meeting, Burlington VT
9. Learning Communities Symposium
10. State of the Waters-Minnesota 2003

■ *Professional papers presented, including seminars*

1. Asah's paper at SCB Duluth
2. Suzanne's paper at SCB Duluth
3. Val's paper at Midwest in Kansas City
4. Niki's paper at Midwest Kansas City
5. High altitude Trichoptera distribution in Minas Gerais state, Brazilian Ecological Congress, paper by Paprocki, H, R Holzenthal, J Perry *et al.*
6. Guest lectures (3) at Karev Pedagogical Institute, Bishkek, Kyrgyzstan
7. Guest lectures (2) at Sichuan University, Chengdu China
8. Guest lecture at Bamenda University of Science and Technology, Cameroon
9. Paper at AID's Africa Strategy Conference
10. Guest lectures (2) at Yellow Springs Instruments, as part of consulting trip
11. University education panel at State of the Waters-Minnesota 2003

■ *Papers submitted for publication, papers accepted, actual citations if they came out*

1. Perry, Pinter and Gulazcy, The man behind the curtain: the role of the Tisza Transboundary disaster as a toll for institutional learning. In *The New Europe*. IN Press
2. Perry and Easter, the Dilemma facing natural resource managers, submitted to *Water Resources Research*
3. Perry and Asah On the edge: Managing Africa's natural resources. Submitted to *Proteus, the journal of ideas*
4. Asah and Perry, Ecological stoichiometry as an explanation for ecological foodwebs. Submitted to *Journal of NABS*
5. Savanick and Perry, 2003. Greening the campus something. *International Journal of Sustainability in Higher Education*.
6. Westrick, Vondracek, Perry and Ferrington. Multivariate versus Multimetric how do they compare? Submitted to *Jour NABS*

■ *Outreach and Service efforts conducted*

1. Minnesota Center for Environmental Advocacy, Board of Directors, Executive Committee, Legal Committee
2. Academy of Distinguished Teachers, Executive Committee
3. Associate editor, *Journal of Life Science and Natural Resource Education*.
4. Editorial Board, *Adaptation and Mitigation Strategies for Global Change*
5. President's Sustainability and Energy Conservation Working Group
6. Manuscript reviews for *Environmental Management*
7. MacArthur Program, Screening Committee for new MacArthur Fellows
8. Water Resource Sciences graduate program, Executive committee
9. Wildlife Conservation graduate program, Director of Graduate Studies
10. US Dept Agriculture Higher Education Challenge Grants review panel
11. NCA 23, Midwest Fish and Wildlife Programs, National Chair
12. NAUFWP, National Associate of University Fish and Wildlife Programs, National Secretary Treasurer
13. *Probably some other stuff*

■ *Proposals developed and their status (i.e., funded, pending, denied)*

1. Wilson, Nieber, Vondracek, Magner and Perry. Stream classification for TMDL assessment using a dimensionless, reference reach approach.. US EPA \$800,080 2003-2006
1. Wilson, Nieber, Vondracek and Perry. Quantifying the variability of stream health indicators for TMDL development. PI Minnesota PCA \$124,016, 2003-2005
2. Paprocki, H and J Perry. Construindo Aqua: Uma ideia que nasce nas cabecerias Presented to State of Minas Gerias, Brazil. \$50,000
3. Environmental management of northern Sichaun Province, China; submitted by Mr. Han and members of the Provincial Department of Science and Technology.
4. Integrated environmental indicators and associated educational efforts for Jui Zhaigou and Hua Long National parks, China. Apparently submitted by Provincial officials
5. The Science, Policy, and Art of Water: A Transdisciplinary Education Initiative Pre-Proposal and then solicited full proposal submitted to Luce Foundation
6. Simmons and O'Donovan. Becoming a teacher: A Memoir project among 10 senior teachers. Unknown dollars; I'm one of the 10. Funded
7. Fonteh, Perry and Ajaga Nji. Integrated Water Resources Management for Cameroon; idle as far as I know
8. Wheeler and Perry. The Como wetland as a tool for local decision making. UROP program. Funded
9. Dahl and Perry. Viral infusion as a means of affecting neural transmission, leading to potential control Australia's invasive rabbit problem. UROP program. Funded.

■ *Personal professional development (e.g., retreats, workshops, training exercises, Human Resource skill development including ethics and other such seminars or workshops)*

Lots of stuff as identified above, like working with each of you and going to China and Kyrgyzstan and Cameroon

■ *Other*

1. CISW Award for the Interdisciplinary teaching of writing
 2. Some really good people worked here including all of the Team members and people like Wes Saunders Pearce and Suzanne Savanick who graduated this year
-

A few thesis defense thoughts (31 January 2004)

Some of these come up because I am sitting on the veranda at 5:00 AM in January in a tropical country, thinking about you. Others come up because I have seen people do things in defenses and thought ‘Damn, they definitely are going to remember that. I wish they had been advised about ways to avoid that.’ This becomes part of *The Brown Book* pretty soon.

- Build one Power Point show as ‘self running’ or ‘pack-n-go’ and second as a straight Power Point show you can change at the last minute. Store both on one side of the desk top and nothing else on that 2/3 of the desk top. That maximizes your chance of finding them when you are nervous
- A good way to prepare is to deliver your thesis to your committee (at least two weeks in advance) and then let it sit for a week. Then read it and ask yourself ‘If I was on the committee, what would I ask? What are the things I would like explained or defended?’ Make a list of all of those and with every one, write down what you would say if someone asks that. Your committee will, almost surely, ask none of those questions and yet what they do ask will be easier. You are your greatest critic and you will think of things they would never dream up.
- Talk to other students who have had these faculty members as committee members. Many of us ask the same questions over and over; most of us ask the same kinds of questions, which sort of is why you chose that person. You already knew in general what to expect from each person if you thought about it.
- Know the literature, that is the basis of all of our work. You should be able to compare and contrast authors and their contributions. You should be able to comment on the most significant advances in your field in the last 25 years, the most significant ones expected in the next 5, the 3-5 most significant players in the world in your field, the most significant journals in your field and why/how one is different from another
- Present your thesis in a very clear context: *I asked this question, I wanted to know this ... so I measured this...* It is better to be clear than extensive. A clear, logical, interesting 40-minute story about 1/3 of your thesis is far better than a diffuse, complex, hard to follow story about all of your thesis
- Be very secure about your experimental design and be sure you can defend it. This is science and academia; you are given lots of license to be creative. However, there is the expectation that you can defend that choice. That you can explain clearly what question you asked, how you approached the answer, how secure you are in providing the answer, under what other conditions your answer might apply (i.e., the idea of inference), and what things would weaken or strengthen your answer. (Note that why you asked that question is almost never asked; you found it interesting and it thus was asked). Finally, expect to be asked ‘So what?’ This does not mean your work has to be applied nor does it mean you have to defend asking the question. Rather, it means who will care? All of science advances because someone posed a question and addressed it in a way that someone else could use to their benefit. That might mean an applied application like a Best Management Practice or an advance in our understanding of some scientific process or an advanced society because you wrote a poem, but someone somewhere will be interested if this work has value. Be comfortable with that so what question.
- Be sure you can comment on **why** you did what you did (i.e., how you made the decisions that were part of and controlled your experimental design); there always are decisions to be made. Be clear about them and their implications
- Don’t talk your committee out of believing your data; develop a sense of confidence and security
- Expect to be nervous; this IS a big deal. So develop ways to deal with that. For example,

- count slowly (and silently) to three before answering some questions
- I realize that your brain will vary with stress and there will (might) be hard questions. But Do Not express surprise at your own data analysis!
-

Professional meetings: How they work

Note: This is a pretty premature discussion of a very important item. Expect this to grow through time.

As usual, I have assumed you know things you had no way of knowing. I thought it might be useful to have a short comment on professional meetings that we can then send again each year or so as we get new people exposed:

Professional conferences are the place we interact most with our professional colleagues. There are local, regional, national, international ones. Most have papers (presented out loud) and posters. Examples include NABS, AWRA, St Croix Rendezvous and many thousands of others. Each has a registration cost; there always is a pre-registration that is much cheaper than on-site registration. Each also has a student registration (lower cost. Each accepts presented papers. You send an abstract in advance (LONG in advance) and it is reviewed and usually accepted. You cannot ever walk into a meeting and say I am presenting this today.

Meetings are valuable because you get to present your work and get feedback, get to hear other work that is much more fresh than published work, get to meet well known and not well known people, get to interact in a different environment, get to meet people you later want as supervisors or colleagues

You should each plan to attend two professional meetings every year. You get money for that from many places like your own pocket, your advisor, your department head, ... we can discuss.