

Report from the Review Committee for the SAFS 10-Year Review

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INTRODUCTION

It was the distinct pleasure of this panel to conduct a 10-year review of the programs administered through the School of Aquatic and Fishery Sciences (SAFS) for the Graduate School at the University of Washington (UW). The panel consists of two UW faculty (John Marzluff, Chair, School of Environmental and Forest Sciences, and Parker MacCready, School of Oceanography) plus two external reviewers (Bonnie McCay, Rutgers University, and Mary Power, University of California). Our evaluation is based on the January 2014 Self-study Report prepared by SAFS, additional written material from affiliates and alumni of SAFS, response of SAFS to the last Graduate School Review, and interviews we conducted on February 6 and 7, 2014, with faculty, students, staff, stakeholders, and administrators of SAFS.

Our unanimous recommendation is that SAFS continue to administer its full line of excellent programs and that the next academic review should occur in ten years time.

The following text focuses on how SAFS, the College of the Environment (CoENV), and the UW could continue the SAFS legacy of excellence. We offer 16 overarching recommendations addressing concerns voiced by the administration, faculty, staff, and students. We also list other specific concerns to be considered by administrators within the School, College, and UW (see listing at end of report).

Of our 16 Recommendations, we judge 4 to be of greatest importance:

- **Increase the transparency of CoENV policies, especially around finances and faculty hiring.**
- **Re-think the Marine Biology Major so that it enhances the present collegiality of SAFS and Oceanography instead of competing with their existing, strong programs.**
- **Sustain and enhance the exposure of SAFS students at all levels to fieldwork, diverse aquatic organisms, and natural environments.**
- **Fix the SAFS website.**

The UW's School of Aquatic and Fishery Sciences enjoys international recognition for excellence in teaching, research, and service to a broad range of stakeholders. Its expertise in fishery stock assessment is unmatched. At the same time as it exerts global leadership in this field, SAFS has a warm, collegial atmosphere fostered by faculty and staff who genuinely value the contributions of each SAFS member, including undergraduate majors. Students, faculty, stakeholders, alumni, employers, and administrators view SAFS as a family. This family has thrived in a new facility and despite a sea change in university administration, organization, and funding.

Since the last Graduate School review, SAFS has joined with other environmental programs at UW in the new CoENV, has experienced declining revenues from its endowments and Washington State funding, and transitioned to an academic funding model based on Activity Based Budgeting, ABB. While all members of the SAFS community contribute to its success, its past and current Directors and Associate Directors were repeatedly praised for their collegial and effective leadership. As noted in the previous 10-year review, SAFS is truly a special institution in the UW, and its excellence in the generation and application of science that is relevant to the region, nation, and planet is richly deserving of future investment and current attention by the UW administration.

ADMINISTRATION

The faculty, students, alumni and external stakeholders hold the current SAFS administration in the highest regard. These leaders are appreciated for their transparency, fairness, and effectiveness. Especially noteworthy is the balanced excellence in administration, research, and teaching shown by the Director, Associate Director, and Curriculum Chair.

Nonetheless, the transition of leadership and administrative structure that came with the creation of the CoENV, coinciding with severe State budget problems, has been a challenge for SAFS, and highlights the need for specific actions by the Dean. Problems impeding SAFS planning and administration arise from policies or practices relating to: (1) the return of monies generated by student enrollments in classes and majors, (2) the return of indirect costs generated by SAFS grants and contracts, and (3) the hiring of faculty. In each of these areas, SAFS administrators could easily estimate funds generated or positions accrued, but had little understanding of how returns were calculated by the Dean's office. While a one size fits all policy cannot accommodate diverse units with idiosyncratic histories and character, there should be more explanation, discussion and perhaps debate of college policies that are seen as deviating from those formerly guiding these allocations. Hires would often come from special joint or "cluster" hires in an area of special interest to the CoENV, rather than in response to SAFS needs. The "parking" of faculty positions (the duration of which is a CoENV policy) was deemed especially problematic, because it either left existing faculty overburdened with extra teaching of required courses, or led to reduced course offerings to current students. In sum, the inability of SAFS administrators to understand CoENV policy hampers the School's ability to plan and adjust its disciplinary mission to new realities and opportunities.

Another administrative issue that cut across the faculty, staff, and students we interviewed was concern over a proposed CoENV-level major in Marine Biology. Some senior faculty see this proposal as problematic, in that it will (1) compete with rather than complement the current SAFS major, (2) increase teaching load without increasing resources (see ABB issue, above), and (3) produce graduates with low employment opportunity. Many of the proposed major's classes will be from those already taught in SAFS and the School of Oceanography. SAFS undergraduates

worry, justifiably, that this will mean bigger class sizes and less direct access to faculty, which currently is outstanding (as they realize).

An area for potential improvement that was noted repeatedly by students and faculty was a desire for more coordination and collaboration with other units on campus.

Recommendation 1. The SAFS Director should consider how to enhance cross-campus collaboration by investigating shared teaching of similar classes (e.g., population biology, natural resource economics, marine ecology, natural resource policy) with faculty in the School of Environmental and Forest Sciences (SEFS), Oceanography, Biology, and School of Marine and Environmental Affairs (SMEA). An effort should be made to continue faculty participation, especially with new hires, in the QSCI curriculum. The bridge with SEFS should be enhanced as the Washington Cooperative Fish and Wildlife Unit seeks to expand its faculty into terrestrial wildlife science.

Recommendation 2. We encourage the Dean and her assistants to work with the Director and the SAFS faculty to empower the School to hire needed faculty and to clarify how resources derived from tuition and indirect costs will be allocated, making the process more transparent and motivational to the faculty, staff, and students of SAFS.

Recommendation 3. The Dean must address the repercussions of the proposed Marine Biology major for SAFS. Experiential learning and connection to the faculty define the currently successful SAFS undergrad major. Every effort should be made to retain these qualities within SAFS, and not drain them in the quest to create new and competitive majors within the College. Discussions between the CoENV administration, the SAFS Director, and SAFS faculty and students should be expanded to determine how best to provide students interested in Marine Biology a more focused curriculum track within existing SAFS and Oceanography majors.

FACULTY

The SAFS faculty is generally doing very well. Tenure-track Faculty excel at research, teaching, and service. Likewise, Research Faculty members are happy with their interactions in SAFS, are successful in raising research funds, and are respected and valued by the tenure-track faculty.

However, there are also important ways in which the support of Research Faculty could be improved. There are 5 Research Faculty and one Assistant Professor WOT, making up about 20% of the total faculty count. They contribute a great deal to the breadth of science done at SAFS, and to graduate teaching (beyond the level at which they are compensated). The primary concern of this group is salary inequality. They rank 15-20% below their peers at other institutions. To rectify this situation, SAFS administration is seeking a unit-adjustment, an approach the panel feels is justified. However, the subject of pay is especially sensitive for Research

Faculty; any pay raises derive from their own funds. Currently research faculty members have no flexibility in either raising or lowering their pay to match grant revenues.

In addition, the future role of the Research Faculty in SAFS should be an important part of strategic planning, especially as many now are relatively senior. Everyone values the contribution of these faculty members, but bringing in Assistant-level faculty on Research tracks was seen as a highly risky career path for junior scientists, given the current difficulty of starting a fully-soft-money research program.

Two other areas of concern arose regarding SAFS faculty. As noted by SAFS in its Self-Study the faculty is not diverse—whether in gender, race, discipline, or pedigree. White males, computational biologists, and UW graduates dominate past and current hires.

From several quarters—senior faculty, agency partners, graduate and undergraduate students—we also heard, amidst unanimous enthusiastic praise for the quality and collegiality of the program and people of SAFS, concern about a narrowing programmatic focus. Over the last decade, as modern genetics, quantitative modeling, and stock assessment faculty and courses replaced aquaculture and hatchery management, concerns have grown about maintaining the School's historic strengths in organismal biology, classical taxonomy, and natural history. Freshwater ecology is currently taught extremely well in the school, but with less campus-wide emphasis on natural history it is harder for students to find help identifying organisms like aquatic benthic invertebrates, algae, or macrophytes. These are important components of aquatic food webs or ecosystems, as well as environmental indicators. Agency partners (e.g. Jim Winton, USGS) also remarked on the societal need for the continued education of SAFS graduates in the taxonomy and natural history of aquatic biota. R.A. Fisher once said "Observation is the only way truly new knowledge comes into the world." Fisheries assessment and analysis and its application to ecosystem management needs to be informed by perceptive natural history and field work that can detect the new, unexpected changes in organisms and real environments that will only increase over future decades.

Of less immediate urgency but also of concern is how the narrow program can be broadened to better serve societal need for more integrated natural resource management. SAFS recently added a resource economist to the faculty, an important step in this direction.

Recommendation 4. The Provost and Dean should revisit the pay structure and its inflexibility for UW Research Faculty. They should make every effort to work within the Faculty Code to address the salary inequality of the Research Faculty.

Recommendation 5. SAFS should look for opportunities to maintain their Research Faculty numbers by bringing in established mid-career scientists who complement

core SAFS strengths. While present funding constraints may narrow the field of such candidates, SAFS' long partnership with agencies with strong research components may sustain opportunities for these affiliations into the future.

Recommendation 6. As the School continues to build depth in its world-class quantitative fishery assessment program, so too should it seek to increase faculty diversity in gender, race, expertise (notably hiring whole organism scientists such as ichthyologists or field ecologists), and academic training.

Recommendation 7. To maintain disciplinary breadth in teaching and mentoring, the UW, CoENV, and SAFS administration should work together to fight narrowing training, particularly the devaluation of natural history science. This could be done with three initiatives:

- (A) The Provost and Dean should continue to support small class sizes (<30) needed for field and laboratory instruction, and support for field courses, which though costly in terms of FTE/teaching credit hours, are life-changing for UW students. The importance of such experiences cannot be overestimated. For example, a number of SAFS students and alums who were able to spend a field season with the Alaska Salmon Program report that this experience 'hooked' them into academic programs and careers in fisheries and aquatic sciences.
- (B) The Dean and Director should facilitate seminars and retreats (perhaps at field stations where participants can better focus on the program at hand) that engage SAFS faculty, postdocs, research scientists, and students with interested participants from other units like Biology, Oceanography, SMEA, SEFS, Civil and Environmental Engineering, Environmental Law, Journalism, the Arts, and Built Environments. Workshops or symposia could include presentations and discussions of topics in aquatic sciences research, career paths and employment opportunities, or topics that cross disciplines and address new emerging environmental and societal issues (e.g., citizen science, adaptive management, species invasion, climate change).
- (C) The Director of SAFS should consider encouraging courses with co-teaching by teams of organismal and quantitative graduate students (or faculty).

Recommendation 8. To more fully develop the ability to train students in integrated fisheries assessment and ecosystem-based management, the Dean and Director should work with other units on a study of the potential for cluster hires and more effective coordination to bring socio-economic and policy expertise into teaching, research, and service activities. This planning effort should include key stakeholders including the Northwest and Alaska Fisheries Science Centers of NOAA.

GRADUATE STUDENTS

In key respects, the SAFS graduate program is in outstanding shape. Applicant numbers remain strong, and as a world-leading program SAFS is able to fill its ranks from just the top 10% of these, of which a remarkable 80-100% enroll. Driving this success is the fact that job prospects for graduates are very strong. However, Figure

I.2 (SAFS Self-Study) makes clear that there is a long-term decline in graduate enrollment numbers. SAFS has about equal numbers of MS and PhD students, and the decline in the past four years has been greatest in the PhD program. This decline is directly linked to decreased grant support for RA's, and a decreasing number of grad Fellowships funded by return on endowments, both consequences of the recent recession. The same trend is evident in units across CoENV, and in the environmental sciences in general. As one means of reacting to this trend, the School has been very proactive in fostering successful applications for NSF fellowships among current grad students (19 in the past four years!).

Graduate students are remarkably well supported, intellectually, personally, and financially in the SAFS program. Ironically, because many students are supported on research funding or endowment or agency fellowships, they do relatively little teaching to support themselves and thereby lose opportunities to gain teaching experience. Some of the students expressed the desire to have more opportunities to teach and engage with undergraduates (as did some of the postdocs, see below). More opportunities to TA may open up if the Marine Biology major is offered. In addition, the development of teaching programs at local field stations (see below) could provide opportunities for the experiential teaching of which SAFS is justifiably proud. These field stations would also be great venues for retreats welcoming incoming classes, and experiences that would hasten the sense of being part of the SAFS community, for graduate and undergraduate students, as well as participating postdocs.

Recommendation 9. In both the College and the School, every effort should be made to provide incentives for the faculty to take on grad students. TA positions generated by returns on tuition generated by teaching courses with general appeal to the UW student body could help (and provide important learning opportunities for students seeking faculty careers), as long as the hours spent by the student do not overrun their ability to make real research progress.

Recommendation 10. The experiential learning that is the hallmark of the SAFS undergraduate and graduate degrees could be the basis for improved outreach and community building. In particular, grad students could use field sites (FHL, Big Beef Creek, etc.) for public outreach, informal education, and welcoming of new people to the SAFS "family." This could be done with modest support from the Director and Dean, and would provide an opportunity for building grad students' communication skills beyond that afforded by standard TAs.

UNDERGRADUATE STUDENTS

The undergraduates in SAFS describe themselves as a happy family. They feel a strong connection to the School and to each other. They know their professors and feel comfortable reaching out to them and the grad students for help. They like the small class sizes, and the Capstone research experience. Those who take advantage of the extended field courses in Alaska or Friday Harbor are changed for life. There have been about 110 students per year in the major over the past decade, reflecting

a small but steady interest. Entry into the major is not competitive, so the numbers are presumably representative of demand. The primary concern of the undergraduates is the proposed Marine Biology major (see Recommendation 3, above). They would also benefit from broader and more consistent advice concerning the School, careers, and capstone projects.

Recommendation 11. The Director and Faculty of SAFS should develop an undergraduate version of the class “FISH 522 Hot Topics in Aquatic and Fishery Science” to help undergraduates understand the breadth of research occurring in SAFS, and to enhance their social and scientific integration. This class should be followed with more career guidance, especially for underclassmen, which might include mentoring of undergraduates by graduate students and postdocs. To add consistency in expectation, the capstone class should be made more formal (as it is in Oceanography). In particular, proposals should be turned in prior to actual fieldwork.

ADMINISTRATIVE STAFF

The administrative staff, including office managers, grants and finance managers, and student advisors, appear to function well. Some have long tenure with SAFS, others—the majority—have short tenure, but all seem pleased with the current situation. As one long-time staff member noted, they are now “in stability,” not in a crisis management situation as at some times in the past. Much credit goes to the leadership of the Director and the Administrator, who are praised for many things including their responsiveness and making people feel safe and secure. More generally, staff say that they feel appreciated by all the faculty, reflecting the fact that “universities are about faculty and teaching but it would be hard to function without staff.”

One general concern is that staff employees are stretched to the limit in terms of workloads and responsibilities, reflecting a long-term reduction in staff positions. They are “right on the edge of keeping it together” with little backup, and they would welcome any assistance, including more student workers.

The one specific issue raised in our meeting with them, echoed in meetings with the post-docs and undergraduates, was the quality and management of the SAFS website. The position of webmaster was disbanded a few years ago, and responsibilities of the person in that position were distributed among members of the staff who felt poorly equipped to handle the technical demands of maintaining and updating the website. Moreover, there is considerable uncertainty about who has responsibility for what, and how to find information.

Recommendation 12. The director has enlisted someone to work on the website part-time, with help from the College, but a longer-term commitment to website management on the part of the School and the College is strongly recommended. The role of webmaster could be combined with another important and underdeveloped function: enhancing communication within and beyond SAFS.

Needed improvements in internal communication could include ensuring that incoming post-docs and others can quickly learn the ropes of SAFS and the College; giving timely notice of upcoming events such as public dissertation defenses and seminars; and maintaining a central database. External communication is as important; examples include working with the media and providing web-based, video, graphic, and print information for clients and the general public.

POST-DOCS AND RESEARCH STAFF

SAFS is home to 15 post-docs and 58 researcher staff. They are critical contributors to the School's successful research programs. The nine post-docs and four researchers we met with appear to be very pleased to be part of this prestigious School. As one of the research staff—who has been here for a long time, as student, post-doc, and now professional researcher—noted, the school has a strong “team spirit, good support system, good mentoring.”

However, as is common in large research universities, post-docs and research staff often “fall between the cracks” or “off the radar screen.” (For example, they had not been notified of the site review meeting until the last minute). Newcomers reported feeling isolated at first, with little guidance about the people and community of SAFS and the College apart from the lab they work with. There seem to be few opportunities for them to know each other, either, although the College/University does have an organization and union for post-docs.

Recommendation 13. Improved orientation is definitely needed. This is another point at which some commitment to improving communication within the school could make a difference. A specific suggestion was to provide a list of incoming post-docs to existing post-docs, who are invited to be informal guides, helping introduce them to people at the School, and learn about resources and logistics, such as where to sign up for email lists.

Recommendation 14. The post-docs and research staff also indicated concern about being underused in the teaching programs of the School. They have very limited opportunities to teach. Efforts to enlist their participation in courses or even teach courses (with appropriate compensation) could enhance their professional careers and provide students with exposure to young, active scientists.

FACILITIES

Three spectacular UW field sites offer SAFS students the chance for experiential learning in the natural history of aquatic (freshwater, estuarine, and marine) environments: Friday Harbor, the Alaska Salmon Program in watersheds draining to Bristol Bay, and Big Beef Creek in Puget Sound. UW's Friday Harbor Lab is iconic in marine biology, and to our knowledge, currently financially secure and well managed. The SAFS runs the Alaska Salmon Program and the Big Beef Creek station. After eighty years of SAFS research in the watersheds draining to Bristol Bay, the Alaska Salmon Program has yielded research of immeasurable value for understanding the scales and diversity of watersheds that sustain salmon stocks.

The “Portfolio Effect,” documented in a series of benchmark papers by Quinn, Schindler and Hilborn, has become a key model in conservation biology. The Alaska Salmon Program continues to generate cutting edge, world-class research, and to inspire students. But it is expensive and still funded primarily on external grants—seeking these is a huge annual effort for the SAFS faculty who lead this program.

Big Beef Creek <http://www.washington.edu/research/field/beef.html> also offers local opportunities for UW students and Puget Sound residents to experience natural ecosystems. This SAFS field station protects a watershed with 30-50 years old forest, freshwater wetlands created by beavers (now widely considered a restoration partner for recovery of salmon habitat), a creek supporting a listed sub-species of chum salmon, as well as coho and steelhead, and an estuary with mud flats rich in marine invertebrates, grassy meadows, and a small salt marsh. The estuary drains into Hood Canal through a channel crossed by a causeway that may be converted to a bridge, which would make an ideal transect for monitoring biogeochemical fluxes between the watershed and the coastal ocean. SAFS no longer has sufficient resources to be the sole unit maintaining Big Beef Creek. This field station would be valuable to other units in the College of the Environment (or beyond, if its potential was realized for retreats, teaching, and research by scientists, artists, writers, architects, or engineers seeking test beds in coastal environments experiencing global change). As such, in addition to serving these academic programs, the Big Beef Creek field station could allow UW to engage local citizens and K-12 or under-advantaged youth in immersion experiences with natural history, whole-life-history studies of organisms that alternate between fresh and salt water, and consideration of the effects of increasing urbanization in the Puget Sound basin. It is likely that partners (e.g. Puget Sound Anglers, WDFW, NOAA which already has facilities on the property, local school districts, TNC) might be found to share the costs of renovating and repurposing this uniquely valuable and irreplaceable natural coastal watershed for research, teaching, and public outreach. Public-private partnerships could permit cost-sharing to preserve and develop this unique and irreplaceable site for the future benefit UW and its neighbors in Puget Sound.

Recommendation 15. The UW and CoENV should target endowment fund-raising to assure the future of the incredibly successful, world-famous Alaska Salmon Program that is still precariously maintained year-to-year by grant writing by a few SAFS faculty.

Recommendation 16. The UW and CoENV should help SAFS negotiate to find partners to help plan and share the costs of renovating and repurposing Big Beef Creek. The responsibility for this remarkable site should either be shared more widely, and sustainably, or the site should be abandoned.

Other Ways in Which the UW can enhance the Excellence of SAFS

Most of these specific issues are quite narrow and can be resolved by consideration within the staffs of the Director’s or Dean’s offices.

1. Issues to be considered by the Director
 - a. Payment of undergraduate “peer” TAs, even at minimal levels, would alleviate the perception that students are paying (tuition) to work. The fact that in-state and out-of-state students “pay” differentially for this experience exacerbates the issue.
 - b. Limitation of students’ abilities to take classes outside of SAFS (e.g., because of prerequisites in Biology) should be addressed in concert with the Dean’s office.
 - c. The work (time) requirements for TAs in different classes are highly variable. Review of TA efforts across classes should be done and equitability sought.
2. Issues to be considered by the Dean
 - a. As expected in a new College and administration, policy changes often, and it is often seen to do so unpredictably.
 - b. Teaching credit for interdisciplinary efforts (e.g. QSCI) is not perceived as enhancing the SAFS “report card” or ABB allocation.
 - c. The Environmental Institute seems to have vanished.
 - d. The MOU between NOAA and UW should be reauthorized and the physical proximity of the NOAA lab and SAFS should be safeguarded.
 - e. Efforts should be made to increase access to the Dean, increase the transparency of policy actions, and stem the growth of administrative staff that draws needed funds from SAFS.
 - f. Promotion criteria are poorly defined. A clear target for new professors would be appreciated.
 - g. Future cluster hires should engage graduate student input to a greater degree.
 - h. In conjunction with the Director and Provost, the way in which union-negotiated raises for TAs affect research budgets should be investigated with an eye toward reducing their effects on existing budgets.
 - i. The Dean should show more concern for the welfare and contributions made by research faculty. By increasing withholding of overhead, less funding is available for student support.
 - j. The vision for the College is often perceived to be at odds with the vision for the School. In particular there is concern that initiatives from the Dean’s office come at a direct cost to flexibility at the level of the faculty and Director (e.g., hiring, offering CoENV curricula).