

Science Advisory Board Review

Annis Water Resources Institute

July 16, 2002

Firstly, the Science Advisory Board would like to thank Dr. Alan Steinman and the AWRI staff for their tremendous hospitality, the thoroughness of their presentations and the open access that we had to the staff during our review on May 3, 2002. We also appreciate the time and candid input provided by the University administration. We think that having a SAB is a creative and valuable approach. We appreciate being selected for this opportunity. The purpose of this report is to provide advice and counsel on how to make the AWRI a valuable asset to Grand Valley State University and the State of Michigan.

Principal Observations

Research Integration

AWRI Water Resources Institute (AWRI) has a successful history based primarily on single-investigator projects. Such a development is not unexpected in an institute dependent mainly on soft money to support these projects. Under these circumstances, the ingenuity of individual investigators is tested constantly in providing resources to maintain their projects. These AWRI projects apparently, until recently, have depended primarily on three Senior Program Managers, one each for the Information Services Center, Outreach and Education, and Ecological Research. Limited interaction has occurred with faculty from Grand Valley State University (GVSU). These circumstances were not conducive to developing comprehensive programs in any of the three activities. A combination of good facilities, new research staff, and a different administrative philosophy can be used to strengthen programs within AWRI.

Strengths—Each PI provides own support. Each PI operates independently. The approach has been reasonably successful to date although few peer-reviewed publications have been produced.

Weaknesses—Does not encourage program development or interaction among AWRI staff or GVSU faculty. Stronger research programs are essential to meet the long-term objectives outlined for AWRI by the AWRI Director and President Murray and Dean Kindschi.

Critical Mass

AWRI staff who have ongoing projects are limited. As the critical mass is approached with the addition of new staff, attention must be given to program development.

Program Development

Of major importance for the future is the need to develop coordinated and integrated programs as one means to strengthen efforts of individual investigators and to provide increased regional and national visibility for such programs at AWRI. Such an effort will strengthen current and future research, teaching and outreach activities and provide an avenue for collaboration with interested participants. Two examples of this kind of activity are the paper by MacDonald et al. (2001) on hydrological events and water quality in the Pigeon River and the class project on spatial and chemical variability of the Grand River Plume (Riemersma).

Facilities

Excellent facilities are available at AWRI. Particularly impressive are endowments that provide support for the operation of two research vessels. The vessel operation is well managed and is a valuable resource for AWRI. The vessels are being used successfully for Outreach and Education but, at present, these ships are underutilized in research activities. There are also excellent facilities within the Lake Michigan Center, such as the GIS lab, analytical lab, and classrooms. We also encourage the further development of the “warehouse” lab, such as with mesocosms, for experiments.

Publications and New Hires

We concur with Dr. Steinman's assessment that the strong research reputation of AWRI must be built on a peer review process and that new hires in carefully selected fields can aid this process. We disagree that each member of AWRI should be required to publish given the valuable assets they provide already in outreach, education and GIS services. The disciplinary nature of the new hires should try to take advantage of the strengths in the fields already at GVSU and AWRI and of partners in other agencies in the region. It seems that the current selection of new hires is based on trying to find good people in several, apparently unrelated fields. It would be very difficult for one individual to create any kind of strong research program with this approach. There would just not be enough depth (critical mass). Rather, the effort should be placed on trying to build on current strengths. A series of hires in wetland ecology, coastal/river ecology and landscape ecology would complement the existing GIS expertise, would fill an open niche in Great Lakes research and would seem most appropriate to the facilities availability (e.g. small research vessel).

Master of Science Degree

The participation of AWRI staff in a graduate program at GVSU is imperative in future development and a strong research program will only be successful if there is a graduate program associated with it. The proposed Master of Science Degree in Water Resources, however, is premature due to a lack of critical mass of AWRI staff and dedicated GVSU faculty and would dilute the Director's efforts. Rather, we suggest the AWRI faculty participate in the new Biology Graduate Program and that new AWRI appointees should be given faculty status in the Biology Graduate Program. Creation of a whole new program in Water Resources would be counterproductive at this time. Strong administrative support would be required. This may, however, be an option at a later time as staffing increases at AWRI.

Weakness—Students at GVSU have no good mechanism to obtain an advanced degree with a specialization related to strengths at AWRI. In addition, there are limited

opportunities for GVSU undergraduates to participate in research, education and outreach activities at AWRI.

Recommendations

We encourage the development of research programs by AWRI staff, GVSU faculty and others that take advantage of unique resources at AWRI. For example, develop research programs based on areas such as the Grand River Plume or Factors Affecting Water Quality in Lake Michigan Tributaries or Landscape Ecology programs focused on wetlands. These programs could be designed to utilize strengths in each of the three present program areas. Investigations could take advantage of GIS and chemical and biological resources to study problems of mutual interest. A mechanism could be developed to utilize undergraduate and graduate students in these efforts. Viable programs could attract and encourage participants from the region. Provide opportunities for undergraduate and graduate students to participate in education and outreach activities. Use research vessels to a greater extent for undergraduate and graduate student education. Because program development depends on cooperative and collaborative approaches, investigate and develop mechanisms to promote interaction, particularly among AWRI staff and GVSU faculty but not to the exclusion of other potential and interested participants.

A major current issue is the structural and functional gap between the AWRI PIs and regular GVSU faculty. If the AWRI staff desire to be more like GVSU faculty, they will have to act more like faculty, or will be met with major resistance from the main campus in Allendale. Thus, we suggest that (1) AWRI MS students should be run through campus, either Biology or Geography, rather than having an autonomous program although the major advisor would be an AWRI PI, (2) the staff should have 9-month hard appointments to not differentiate them from Allendale faculty (thereby avoiding a build up of resentment), and (3) AWRI staff should offer coursework (say, 1 course per year) open to participation by upper division and graduate students on the main campus. In essence, AWRI needs to blur the distinction between AWRI 'staff' and Allendale 'faculty' to achieve their ultimate goals.

Information Services Center

Strengths

Under the leadership of John Koches, the Information Services Center (ISC) has grown to become a significant service provider for water resources information and planning in western Michigan. Awards, contracts, and gifts made from 1986-2000 totaled \$2.9 million, and current awards total more than \$3 million. The clientele base is primarily local governments, although the prime source of funding for those local projects is often U.S. EPA and the Michigan DEQ. John Koches has done an admirable job of recruiting, training, and retaining qualified support staff, who are paid almost entirely on soft money. The ISC seems to be well equipped, with a good plan for maintaining up-to-date equipment. The fact that the ISC has been able to retain its computer personnel for so long, given the lucrative job market for people with IT experience, speaks well for the working climate established within ISC.

The project list has shown two desirable trends: (1) increased average award size, and (2) increasing focus on watershed and stormwater management. Larger award size is desirable to minimize fragmentation of staff time, and increasing focus is desirable to take advantage of the talents and interests of Mr. Koches and his staff. The increasing focus is also desirable in terms of marketing of the ISC services, reducing the time required to solicit projects as satisfied customers return with repeat business and engage new customers by word-of-mouth advertising.

The work of the ISC provides an important outreach function to communities within the western Michigan region, increasing the visibility of the AWRI as a whole. The group's expertise fills a clear regional need for water resource information, and has undoubtedly benefited water quality management in western Michigan. The ISC has not provided formal education of students, although many GVSU students have undoubtedly benefited from the training and informal education they have received at the ISC.

Academic departments at GVSU have also benefited from the assistance provided by ISC in setting up a campus GIS teaching facility.

Weaknesses

Director Steinman expressed his increased expectation of PIs to publish research findings in peer-reviewed literature. The writing of peer-reviewed publications has not been an emphasis of the ISC. The primary output of the ISC has been GIS products, and technical reports in support of those products. Written documentation of GIS products provides important metadata, so it is a strength that such reports have been written.

Journal publications could provide wider recognition for the accomplishments of the ISC, and could inform groups with similar interests about methods and pitfalls, but would probably not increase the client base for the ISC due to its local and regional focus. Some increase in peer-reviewed publication in journals such as *Journal of the Urban and Regional Information Systems Association* or *Journal of the American Water Resources Association* would be desirable.

Challenges

AWRI could leverage its investment in the ISC by hiring a new staff member with complementary interests, such as a landscape ecologist. Mr. Koches and AWRI have already built up the ISC's equipment and technical expertise, and a new hire could take advantage of that strength. The new staff member might assume a greater role for peer-reviewed publication. Policies for sharing and support of the ISC facility would have to be developed early to smooth the transition from a single-PI to a multiple-PI facility.

Recommendation

The Science Advisory Board was impressed with the accomplishments of the ISC to date. We recommend a slight increase in peer-reviewed publications from the ISC. We

also recommend that AWRI hire a new staff member in a field complementary to the ISC, such as a landscape ecologist, who could build upon current strengths.

Education and Outreach Program

The Education and Outreach program at AWRI is directed by Dr. Janet Vail, who is assisted by 10 part-time instructors, an individual (Mr. Jeff Auch) on call for special projects, and a number of student interns. The program includes 9 ongoing projects ranging from vessel cruises for educational activities to regional conferences to teacher continuing education and to state and federally funded demonstration projects. The program appears to be extremely active and well integrated into the overall objectives of AWRI. Examples of important regional activities organized and sponsored by this program are the “Lake Michigan: State of the Lake” conferences in 2001 and scheduled for 2003 and the GLOBE and WET programs for teacher training. The program is well invested in local, regional, and state environmental activities that focus on water.

A particularly impressive aspect is the K-12 educational program for local children and high-schoolers conducted in the AWRI classrooms and aboard the vessels. The classrooms instruction combines modern technology with hands-on experimentation and exploration. In 2001, the W.G. Jackson accommodated over 5000 people, mostly students, while the D.J. Angus took over 3000 people on cruises. The reports that we received at AWRI suggest that the vessel educational program is extremely effective at reaching the local population and clearly builds good will and support among the local community. This is a very important activity because the local community funded the new Lake Michigan Center, and should continue to be a strong advocate for AWRI with proper involvement. The fleet captain, Mr. Tony Fiore, and the captain, crew, and instructors of the W.G. Jackson, which we toured, are highly professional individuals. The vessels are nearly fully subscribed during the spring and early fall with up to 3 cruises per day when local schools are in session. The summer period is less active for the vessels, and therefore research projects can be better accommodated during that period. The W.G. Jackson is now certified for overnight cruises on the lake, which

should extend its research capabilities. Regardless, the vast majority of the vessel time is currently invested in education and outreach.

Dr. Janet Vail is the only fulltime staff member dedicated to Education and Outreach. She is fully extended in managing the many projects and activities conducted by this arm of AWRI. The potential to expand this component of AWRI exists, if desired by the Director, but is currently limited by the size of the permanent staff. This program serves a vital function in the local community, which has invested heavily in AWRI, but will ultimately be constrained by staffing. The program recently lost a fulltime staff member, Mr. Jeff Auch, to a different program. We suggest that AWRI consider hiring an assistant to Dr. Vail or explore other means to enhance the scope and reach of the Education and Outreach program. Overall, the Education and Outreach program appears to be very well run and represents an excellent means of nurturing strong ties to the local community. The program recently has developed regional and statewide activities and could be competitive for national education grants with appropriate development and staffing.

Conclusions

We believe that the Annis Water Resources Institute can provide a unique and valuable asset to Grand Valley State University. The leadership and energy exhibited by Dr. Steinman ensures that this will happen. We recommend that this development be done in close collaboration with the GVSU Campus and other potential partners and that serious consideration be given to a sequential series of new hires that are more closely aligned with available expertise.