

WERI
Early Problems, Projects, and Progress

by

Stephen J. Winter

Keynote Speech

Water and Environmental Research Institute

Twenty-fifth Anniversary Celebration

University of Guam

2000

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Where to begin!? At the risk of getting a little personal, it all really goes back to when I came to Guam — September, 1972 — almost 30 years ago! After an exchange of correspondence with Keith Binford, the Dean of what was then the College of Business and Applied Technology, I decided to move to Guam where I would be given the opportunity to play a leadership role in the budding engineering technology program. I had just received my doctorate and was at full speed looking for an opportunity for career advancement in a University setting. Even though I was a new Ph.D., I had kind of sworn off basic research in favor of teaching at a practical level. The A.S. degree engineering tech programs — and the alluring climate of Guam — were exactly what I was looking for.

All went well at first. After only a year at the University I was chairman of the engineering tech department. Within a year or two, we had even added two new faculty to the department, one a Ph.D. (in electrical engineering, I believe). Unfortunately, however, this progress was short lived. After I had been with the University only a few years, the legislature decided to move the engineering tech programs to the Vocational Technical High School — along with any engineering tech faculty that wanted to go with them. I was stuck. Although I loved the engineering tech programs, I wanted to remain in a university environment. I did and I recall teaching courses in elementary computer programming and physical science. Not really what I had come to Guam to do. Quite a dilemma.

Only shortly thereafter (around 1975), Jim Marsh, a Marine Lab faculty member, dropped by my office with a request. "How would I like to be the director of a newly-formed water research center?" He was serving as acting director. Apparently because the University recently became a land grant college, it also became eligible for a federal grant in support of a "state" water research Institute. Well, water research was about the farthest thing from my mind. My own dissertation research was in the area of structures and machine design. I hated the one hydraulics course I had to take as an undergraduate and swore I would never become involved with this area again. Water research — of all things! And I had sworn off research in favor of teaching! Well, Jim explained to me that his marine biology wasn't too close to water research either. And, it would be much more appropriate to have an engineer at the helm instead of a biologist.

I gave all this a good deal of thought and, in light of my present fix being stuck with teaching courses I wasn't really interested in and my desire to remain at the University, I agreed to serve as acting director. I did this on one condition, that the University would have to settle for very applied research on my part. I was through with the relatively high-powered math that is part and parcel of basic engineering research. All this settled, I succeeded Jim as acting director of the newly formed Water Resources Research Center (WRRC). I believe that this was initially a half time position on soft money funded by the federal grant supporting the institute. I still taught half time in the physical science/computer areas. And now the fun began.....

Initially the Center was located in a room on the far left of the recently completed second floor of the Marine Lab. This was a lucky break for the Center as the Lab had an excess of space at that time. I had desk in one corner of the room. For staff, the Lab kindly agreed to let the Center use their secretarial crew. Bill Zolan, a Marine Lab grad student, had also been hired on a part-time basis with the grant money to do water quality analyses in support of project research. That was about it! Not much to work with. But, a start.

Initially, we received grants for two fiscal years, 1975 and 1976, at the same time. I recall that the amount for each year was \$40,000. The granting agency was the Office of Water Research and Technology (OWRT) of the Department of the Interior. Prior to my arrival on the scene, Jim had collaborated with the staff of the University of Hawaii water institute in order to come up with a suite of research projects for these fiscal years. Without their help, the Guam institute would not have come into existence. My hat goes off to Steve Lau, its director at that time, and Reg Young, a civil engineering faculty member who associated closely with the Hawaii institute. We are also indebted to John Mink, a private consultant in the area of groundwater hydrology based in Hawaii and who also worked closely with Steve and Reg at the Hawaii institute.

I say that the Guam institute couldn't have come in to existence without their help for at least two reasons. I suspect that they educated Jim on the ins and outs of the OWRT grant; it is no fun wading through strange federal grant guidelines cold. They were also principal investigators of many of the initial WRRC projects. I recall that project #1 was reprinting of a report that John wrote as a consultant for PUAG dealing with the groundwater resources of Guam. This was an extremely important project as this tome (it was really a book!) was in danger of becoming lost on bookshelves in various agencies on Guam (as is the fate of the efforts of so many consultants that produce documents to assist the various island governments in this part of the world). This "project" enabled wide distribution of this important report that remained the Bible on groundwater resources of Guam for at least a decade — perhaps longer. Steve along with John were principal investigators of a project that used tritium to date the groundwater of Guam. This brought Steve's expertise in the groundwater area to play as well. Finally, I recall a project dealing with the quality of urban runoff on Guam. The intent of it was to get a handle the quality of water that was being discharged into ponding basins used to recharge the aquifer underlying northern Guam as well as of the water that was being discharged onto the reef at the coast. I suspect that the Marine Lab was also involved with the initial suite of projects, but their project escapes me now.

In the late 70's the airports in Micronesia were being lengthened and paved. They were previously short packed coral runways — a real adventure to land on in a 727. We were fortunate in being able to secure contracts to monitor marine water quality at these construction sites on Truk, Kosrae, Palau, and Yap. These projects further enhanced our water quality lab capabilities and gave us a great introduction to water problems on the various Micronesian islands. These projects also provided funds in support of indirect costs. I recall that at that time, University policy was that the department that generated the funds would keep half of the money and the other half would go to the administration. This nest egg helped out a lot with the purchase of lab and office equipment and even with travel to neighboring islands of Micronesia.

Early on I decided that the institute would devote a significant amount of attention to the neighboring islands on Micronesia. Even though our OWRT grant was for the "state" of Guam, I tried hard to devote one project per year out of every grant package to Micronesia. This helped my own research interests which had gradually gravitated to the solution of remote island water supply and energy problems. No high powered research required there! One of my first projects in Micronesia was a demonstration groundwater pumping system on Pis island in Chuuk State of the FSM. I'm happy to say that this is one (of the very few) early solar pumping projects that has survived to this day — due simply to the efforts of the very dedicated chief of the island.

The initial set of projects funded by OWRT and the airport projects were keeping us busy. Another set of projects were drawn up for 1977. I recall being the co-principal investigator of one that dealt with modeling a portion of the PUAG water distribution system. The other PI was John Liu, the Ph.D. engineer who had, like myself, come to the University to work with the engineering tech program. His expertise in computer programming and my fledgling efforts at water distribution system analysis enabled us to draw the project to a successful close. As was the case with the initial urban runoff project, every year we funded a project dealing with water

quality. These projects enabled us to purchase equipment that gradually provided us with a very very good water quality lab.

We were making progress. I think it was about now that we hired our own clerk-typist on soft money. We were to go through a number of clerk-typists until we finally found Evelyn Paulino who was a real asset to the Center. Ultimately, she became our administrative officer and handled all the paperwork and financial matters that, for better or worse, are part of running any organization.

In spite of the progress we were making, it should be clear from the foregoing that we were a rather strange research center. We had no professional staff and there was no expertise at the University in the classical civil engineering water research areas of surface and groundwater hydrology, water distribution, and sanitary engineering. We were blessed with the assistance of the Lab as, at that time they were the premier researchers at the University. Every year we managed to come up with a project that dealt with estuarine problems or fresh water discharge onto the reef. These were fresh water areas fundable under the OWRT grant that were of interest to Lab researchers. As far as staff was concerned, however, we had a long way to go. So, I began to lobby with the administration for permanent faculty slots funded on hard money. The precedent of the Marine Lab helped. If you want to have a viable research center, you must have a critical mass of competent researchers.

I was successful in this effort. I believe that, initially, the University funded two positions — one in the area of water quality and the other in the area of groundwater. Pete Cowan, a sanitary engineer, filled the first slot and Jerry Ayers, a geologist, filled the second. Both were new Ph.D.'s and both were very productive researchers. With their help, we began to establish a name for ourselves, not only on Guam, but throughout Micronesia as well. We could also more easily fulfill the requirements of the OWRT grant program for research in the key water related areas. I recall Jerry cutting and analyzing limestone core samples taken from the northern Guam aquifer that had sat idle for many years. Both he and Pete were also active in contract work in Micronesia. Jerry led a team which did a very comprehensive groundwater study on one of the islands in Pingelap atoll. He was often assisted by Russ Clayshulte, a Marine Lab grad student who worked with us for many years both on water quality and geology projects. Pete was involved with water quality studies of rainwater catchment and storage systems throughout Micronesia. I also recall him working on a marine water quality survey in the Marshall islands.

At about the same time that our staff was coming together, we were able to make real progress with our physical facilities. To make a long story short, we were eventually given four houses on Deans' Circle to use. Fortunately for us, the era of the Government providing housing and other contract benefits for off-island faculty such as myself had come to an end. This freed up some very nice quarters on Deans' Circle. One house was used for faculty and administrative offices. The second was used for a water quality lab. The third was used for a geology lab and to house faculty in that area. The fourth was used to house limestone core specimens from the northern Guam aquifer.

I would be remiss if I did not acknowledge the support that the University administration provided at that time. Our President, Rosa Carter, did her best to have the University live up to its commitment of maintaining a high quality water research institute. I forever plagued Al Blas, our Vice President of Operations and Support Services, with all the detail problems that arise on a day to day basis — as well as some of the bigger ones like the need for faculty and facilities. He was a great friend.

All of this took place in the short time of 5 years or so. We were moving fast. There was other progress as well. Somewhere about then, my position as director became full time and funded on hard money. Bill Zolan, who by now had completed the requirements for his M.S. degree at

the Marine Lab was also added to our locally funded staff as director of the water quality lab. Finally, we added a clerk typist to help Evelyn with office responsibilities.

We were still short on professional staff, however. I didn't think we had really reached the critical mass required to operate a "real" water research center. As a partial remedy to this problem, we brought in a few consultants to help out on specific research projects. Dinshaw Contractor spent over a year with us and developed a computer model of groundwater movement in the aquifer underlying northern Guam. I believe that he still is involved with this work till now by means of short term contracts with WERI. His brilliant mind and kindly manner were a real credit to the Institute. Leroy Heitz, one of WERI's present research staff members was originally brought here on a short term contract to do work on low-head hydro in Pohnpei. He had just finished his dissertation in this area. All of you know Leroy; there is no need to talk about the contributions he has made to research and education at the University.

During my tenure as director, I think we also acquired a third permanent faculty slot. It was initially filled by Akio Wake, a civil engineer who, in my opinion, could make a computer model of anything that flows or moves! He continued Dinshaw's work on modeling groundwater movement in the northern Guam aquifer, developed a model of air movement at a potential wind generator site on Guam, and modeled water movement in Apra harbor. Quite a guy!

One of the requirements of the OWRT grant was that it be used to support interdisciplinary research — not simply the traditional civil engineering water research areas. Initially, I regarded this as a nuisance requirement. But, I was forced to go through the motions annually of advertising to the entire University community the availability of funding for water research. To my surprise, Becky Stephenson from the Anthropology Department, applied for support of a project dealing with water use customs — on Guam, I believe. We funded the project, out of duty, not thinking it would amount to anything. Well, she did an exemplary job and that project led to others: studies of water use customs on Ulithi in Yap, in Laura in the Marshall Islands, and on Nema in Chuuk. Becky often worked with her husband, Hiro Kurashina, on these projects. A great team. It took a long time for it to sink in to my head that, especially in the remote developing areas, the people problems that Becky and Hiro tried to get a handle on are far more difficult to solve than the technical ones. My thanks to Becky and Hiro for waking me up on this one.

There used to be another research institute at the University called the Guam Natural Energy Institute (GNEI). It never amounted to anything and I arranged for it to merge with our Water Resources Research Center. It seemed reasonable to do this as my work at Center often involved solar power, a natural source of energy. We thought a while for a name that would accurately portray the mission of the Center. We also wanted it to indicate our regional role. This is how the present name came about: The Water and Energy Research Institute of the Western Pacific, more affectionately called "WERI." Some people thought the name was a little presumptuous for such a small research center. Looking at WERI now, it is easy to see that that is not the case.

I tried but failed at two efforts to enlarge the scope of WERI. The enabling legislation for the OWRT program also provided for a "state" water institute for the TTPI. All that was really required would be the request of that particular state. The legislation also provided for the establishment of regional water research institutes, institutes that would serve more than one state. I secured the endorsement of the proper officials in the TTPI. However, OWRT didn't go along with our petition. I don't believe they thought we could handle the added responsibility. I also tried to implement a pre-engineering program at WERI. This program would make use of math, science, and liberal arts courses already offered at the University and WERI staff members would handle the classical sophomore level engineering courses. Graduates of the program would feed into the junior year at the University of Hawaii or another engineering

school. Unfortunately, this program was not approved by the Board or Regents — or at least I thought it wasn't. More about that later.

I had a vision for WERI. It had a number of aspects:

1. physical facilities rivaling those of the Marine Lab
2. a research staff with expertise spanning all the traditional civil engineering water research areas
3. the offering of courses and programs in water-related areas
4. a formal regional mission with reliable funding support

I retired from the University in 1985 at a time when WERI was hurting. A number of faculty members had left and it was becoming increasingly hard to replace them due to the fact that the University's salary scale wasn't really adequate to recruit engineers. Like lawyers, engineers are much more expensive than English professors! Before I left, I recruited Peter Huntoon, a geologist, to serve in a short term capacity as Director. I also recruited Shahram Khosrowpanah, then a new Ph.D. I understand that Peter was quite a radical and may have succeeded in shaking things up enough to revitalize WERI. You all know Shahram. Primarily under his leadership, WERI has flourished and grown to what it is today.

Getting back to my vision, it is easy to see that everything I dreamed of has now come to pass — beyond my wildest expectations:

1. WERI has a new facility. It is a showpiece, something that the University can truly be proud of. Among other things, it houses a water quality lab that may be second to none in the western Pacific area.
2. WERI now has a staff of a half dozen or so very qualified researchers. Their combined expertise is unmatched in the western Pacific area.
3. Strangely, Leroy checked out the Board of Regents minutes at which I thought the pre-engineering program was disapproved. According to the minutes it was actually approved and, shortly afterward, the program became a reality. WERI now also offers an M.S. program in environmental science. All this adds to the work load of the staff. Somehow, they manage to do a great job at everything.
4. With the help of Nachsa Siren, then the director of environmental programs for the FSM and a long time supporter of WERI, WERI has formally become the regional water research institute that receives grant funding from the US Geological Survey (USGS) (funding was formerly from OWRT) in support of water research both for Guam and the FSM. WERI is the only regional water research institute in the US.

A few years ago, an evaluation team made up of directors from various state water research institutes determined that WERI was among the top 5 institutes in the nation. Quite an accomplishment for the University of Guam when you realize that it was competing against huge mainland state universities. I'm proud to have played a small role in all that led up to this.