

1994 FOUNDERS AWARD

Citation

L. Douglas James

It is indeed a pleasure for me, on behalf of AIH, to present this Founders Award to L. Douglas James. Doug James has been a major player in the growing recognition of hydrology as an independent science in the US. I have known Doug since 1967 when I joined the faculty of the University of Kentucky. He was already at Kentucky and had a very active and productive teaching and research program in hydrology underway.

As a product of Stanford University and a student of Ray Linsley, he was among the first to fully appreciate the power of the computer for hydrologic simulation. He was among the first, if not the first, to implement automatic parameter estimation routines on the computer so that the parameters of a hydrologic model could be estimated by the computer based on algorithms provided by the modeler.

Doug hit the big time when in 1971 McGraw-Hill published a book he wrote with R.H. Lee entitled, "Economics of Water Resources Planning". This book had a major impact on Water Resources Planning and was adopted for use in many Universities. I wouldn't be surprised if many in the audience this evening have studied out of or otherwise used this book.

Over the years Doug has been involved in many Water Resources Planning activities including work for the World Bank in India and Bangladesh. He has served on several Councils and Boards at the national level including the Presidential Panel on Review of Federal Dam Safety and several activities with the National Academy of Science and the National Research Council. For many years, Doug was very active within the Universities Council on Water Resources including six years on the Board of Directors.

In 1982 I was the editor of a monograph published by the American Society of Agricultural Engineers entitled "Hydrologic Modeling of Small Watersheds." Doug was the lead author of the chapter on "Selecting, Calibration and Testing of Models," a topic on which he has special expertise. That chapter has been the most widely cited chapter of the monograph as well as being one of the most widely cited references on the topic.

Doug has served on the faculties of the University of Kentucky, Georgia Institute of Technology, Stanford University, Washington University, University of Virginia and for 15 years served as the Director of the Utah Water Research Laboratory, one of the premier such labs in the country. In 1992, in recognition of his outstanding reputation and accomplishments in hydrology, Douglas James was asked to initiate and was named as

HAAN

the first Program Director, of the Hydrologic Sciences at the National Science Foundation, a capacity in which he continues to serve.

Doug is a registered professional engineer in three states and holds certificate number 114 as a Certified Hydrologist of the American Institute of Hydrology. It is for his service to AIH that he is being recognized here tonight. A founding member of AIH, he has been one of the prime movers of the Institute since its beginning. He has been on the Executive Board continuously since 1983 when he served as Vice President for Academic Affairs and was very instrumental in getting our examination procedures operational and then revised to the point they are today. Doug has served as Senior Vice President, President and now as Past President of AIH. He has spent countless hours working to insure the beginning, formation, growth and stability of AIH.

No one is more deserving of this Founders Award for outstanding, long, and dedicated service to the Institute than Douglas James.

C. Thomas Haan

Oklahoma State University, Stillwater, Oklahoma

1994 FOUNDER'S AWARD

L. DOUGLAS JAMES

National Science Foundation, Hydrology Program
4201 Wilson Blvd., Arlington, VA 22230

Acceptance Speech

Crafting a Stronger Institute

We live in exciting times for hydrology. It is a time of challenge and a time of change. It is a time to thank the Founders of the American Institute of Hydrology for seeing a need and creating our organization and a time to build on what they started to stay ahead of the new needs developing within our profession. If we stay like we are, we will gray, become stale, and die; and I believe that the role for AIH within hydrology and as a service to society is too important to let that happen.

The challenge begins in our past. Hydrology began by addressing problems in pieces. Piece by piece, hydrologists learned to estimate flood flows for bridge and channel design, watershed yields for reservoir and water supply system design, impacts of watershed conditions on runoff and sedimentation for land use management, aquifer recharge and storage for well-field design and ground-water management, the transport of metals and toxic organic chemicals for protecting the quality of surface and ground waters, and physical and chemical stream-flow regimes for aquatic resource management.

In my term as President of AIH, I was approached by hydrologists with several specialties who wanted certifications in branches of hydrology. This would certainly make it easier for the specialists to pass examinations, but the Institute felt that society would, in most cases, be better served by hydrologists with more holistic outlooks.

While we must learn more about the pieces, the answers to the larger issues in hydrology will only come by putting the pieces together. In my position as the Program Officer for Hydrologic Sciences at the National Science Foundation, I see growing recognition of the necessity for integrating scientific specialties through interdisciplinary research. We need the same integrating effort in professional practice applying current science. The challenge that I would put before AIH is to contribute to integrating pieces of hydrology in practice; and I must hasten on because the challenge can only be met with a way to succeed.

Earlier, I noted that we also live in a time of change. The changes affect both the information that society wants from hydrology and the tools that hydrologists have to deliver that information.

On the demand side, hydrologists face economic pressures to provide the water needs of

JAMES

growing populations and more sophisticated technologies associated with urban-industrial development. We face environmental pressures to keep water and land management driven by these economic pressures in harmony with the sustained health of biological communities. We see legal mandates, often driven by political forces that ignore both economic and environmental expertise, on how to manage water and discharge wastes.

On the supply side, hydrologists can now employ real-time surveillance, assemble world-wide data bases, automate analysis and control, and utilize much more comprehensive descriptive information in research. The times are exciting because the advances on the supply side can enable us to rise to the pressures on the demand side. The bits and pieces are coming together.

Currently, I sit where I can watch research in the hydrologic sciences rising to the "demand" challenges by taking advantage of the "supply" changes. Researchers in surface-water hydrology who once sought algorithms that gave higher correlations between rainfall and runoff now analyze water's pathways over, through, and under the ground surface en route from where rain falls to where rivers discharge to the sea. Researchers in ground-water hydrology who once calculated well drawdown and aquifer yield now focus on chemical transport and aquifer remediation. Researchers who once displayed flow hydrographs are now looking at particle and chemical transport and the impacts of water quality on human health and sustained environmental productivity. In summary, scientists with vision are producing new products for hydrologic analysis.

As researchers advance the science, practicing hydrologists must advance the applications. To lag would be to betray the sense of responsibility to the public that led the founders of the American Institute of Hydrology to work for certification.

What can we do? In today's terminology, hydrology is an information service. People use hydrologic information to reduce flood losses, to secure water supplies, to protect water sources from pollution, to guide practices in land use, and to manage aquatic habitats. Society gladly pays for sound information that people can use to reap benefits, and the potential gains are so large that big money is involved. Needless to say, there are always people who will take money and deliver shoddy information. The purpose of AIH is to provide a certification process that helps protect society. It is achieved by both identifying practitioners who can do a good job and by helping them keep current.

Good information delivery depends on both valid facts and understandable presentations. Hydrologists must be imaginative on both fronts, and we can begin by brainstorming.

For context, let us consider recent changes in flood hydrology. A few years ago, hydrologists were asked to provide peak flows, stages, and hydrographs for structural design. Engineers used the information to design, construct, and maintain facilities. The public saw facilities that worked and had warm feelings.

Today, hydrologists work with the many flood plain occupants to assess risks to flood plain uses and properties. We can map flow magnitudes and inundated areas throughout river systems. We can display floods, prescribed by date or by frequency, with dynamic computer graphics. Simulations in color can show current or anticipated land uses and buildings followed by a flood coming down river, over topping banks, destroying properties, and disrupting land uses. People can be given dramatic visualizations of how they would be personally affected, and a better informed public can more effectively participate in the regulatory process.

1994 FOUNDERS AWARD

Floods are just one example. Regulations on water conservation, land use, and waste discharge can also be made to work better through public understanding. Professionals and the people they serve can evolve an ethos for using hydrologic information in the integrated pursuit of economic and environmental wealth.

After making the case that hydrology can support tremendous gains through better management, I must also say that we must protect people from faulty information. AIH has the mission of quality control. We certify qualified people to give society needed quality assurance when purchasing hydrologic information. We fill a need where governmental registration laws fail because:

1. **Scale:** Governments deal with masses of people, and the world has only a few thousand practicing hydrologists. People often need information on hydrologic topics that are so specialized that very few people in any one governmental jurisdiction are knowledgeable. These small communities of specialists do not work well through bureaucrats.
2. **Dynamics:** Governments work through cumbersome institutional processes that respond slowly to change. Where professions have strong registration programs, the states of the art are generally evolving more slowly than hydrology.
3. **Fragmentation:** Governments respond to political clout and recognized status. Hydrologists identify with no single discipline but with geology, engineering, forestry, soil science, geochemistry, or professions with other paradigms that seek other integrations of expertise in registration.
4. **Law or Ethics:** Governments work by imposing laws, but sound synthesis when small groups of scattered people work in a rapidly evolving discipline must be a matter of ethics. In this arena, governments work poorly.

Because of these difficulties, AIH can fill a gap by supplying a better way. Eventually, governmental registration agencies maybe able to overcome these problems, and AIH must always be ready to work with the boards of registration for hydrologists that are established. In the meantime, we can complementing what governments can do in the four problem areas:

1. **Scale:** In a profession with many specialties whose practitioners are scattered around the world, the Institute can draw on the total community to evaluate expertise.
2. **Dynamics:** In a profession where the state of the art is changing rapidly, we who were once qualified will fall behind unless we make a special effort to move science into practice. The Institute can promote discussions of timely issues and publish articles quickly.
3. **Fragmentation:** In a discipline where scientific publications apply mathematics in rigorous descriptions of special situations, the Institute can provide a forum for holistic interpretations with practical applications in settings with real world complexity. In a profession dominated by specialists operating from divergent paradigms, we can bring the strengths of each one into problem solving.
4. **Law or Ethics:** In a world where scientific issues are being "decided" in courts of law, we can engrain an approach to truth in standards of professional ethics that set a way for many other small professions as well.

JAMES

This analysis has important implications:

1. AIH cannot afford to let our conferences become meetings dominated by academics. Presentations need to take the practitioner's perspective in synthesizing science, discuss residual issues, and build professional ethos.
2. AIH cannot afford to let our journals become science outlets. Papers need to present ideas on how synthesize from science and disseminate methodology to address practical problems.
3. AIH must ever work to prevent our profession from acquiring a public image of "pay and we give you what you want." We must face uncertainties squarely, present best judgments, and build rapport for working together with the public to address new opportunities.

Indeed, we do live in exciting times for hydrology. I see increasing demands for information and growing capabilities for providing quality products. I am grateful to the Founders of the American Institute of Hydrology for creating our organization. I feel an obligation to work hard to build on what our Founders started. In my personal life, I can not stop turning gray; but in our Institute life, we can keep from becoming stale. We will always have fresh answers if we work from a current concept of the role for AIH within hydrology and a clear plan for its implementation. Nothing is so exciting as a charging ahead to overcome great obstacles.

The Founders Award was established by the American Institute of Hydrology in 1990 to honor the three founders of AIH for their initiative and vision in forming the Institute. The Award will be given to an AIH member for outstanding, long and dedicated service to the Institute. The 1994 and 19995 Founders Award was presented at the 14th Anniversary Meeting of the American Institute of Hydrology in Denver on May 15, 1995.