

## 2007 ROBERT G. WETZEL AWARD

### Dr. Robert H. Meade, Recipient

This award was established in 2006 at AIH's 25<sup>th</sup> Anniversary Meeting in honor of Robert G. Wetzel, a great leader in the hydrological field of Water Quality. The award is presented annually, on the recommendation of the AIH Awards Committee, for a major contribution to the field of water quality hydrology. This is the first year the Robert G. Wetzel Award has been presented.

#### **Citation by: *Glen Patterson, U.S. Geological Survey***

The AIH R.G. Wetzel Award Committee recommends that the 2007 Award be given to Dr. Robert H. Meade, retired Hydrologist with the U.S. Geological Survey, for his contributions to the science of sediment transport in large rivers, and for a lengthy career of dedicated professional service.

Dr. Meade has made fundamental contributions to several areas of the study of large rivers, their floodplains and estuaries, and their transport and deposition of sediment. He has carried his research to many corners of the globe, entered into productive collaborations with scientists from many countries, and helped to generate an enthusiasm and a methodology for studying large rivers as whole units. His leadership in organizing large research teams contributed to the success of his efforts on large rivers. Another part of his success was his utilization of research vessels as traveling sampling platforms and laboratories.

Some of Dr. Meade's notable early research on large rivers was done in the Amazon Basin in the 1970's. He studied and described the basic hydrology, sediment transport characteristics, particle-size distribution, and other aspects of the entire Amazon and its major tributaries. In order to successfully sample such a large river, Dr. Meade and his team were required to make significant adaptations to existing sampling equipment. Some of these techniques were subsequently applied to the Orinoco Basin in a study of regional controls on geomorphology, hydrology, and ecosystem integrity.

In the late 1980's Dr. Meade turned his attention to the Mississippi Basin. Although the Mississippi River System drains water from 31 States and is the source of 23 percent of the public surface-water supplies for the United States, the Nation had not had a systematic water-quality study that covered the entire length of the Mississippi River prior to his study that was begun in 1987. In conducting this study, Dr. Meade and his team from the USGS made use of new technology for representative sampling of large rivers, developed in studies of the Amazon and Orinoco Rivers. Initiated to assess the water-quality of the Mississippi River System below St. Louis, including assessing the contributions from the Missouri and Ohio Rivers, the study was expanded in 1991 to cover the entire Mississippi River System. USGS scientists coordinated their activities with various from States along the Mississippi River, as well as with the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers, and interacted with members of the Upper Mississippi River Basin Association, Upper Mississippi River Conservation Commission, and the Interstate Council on Water Policy. The study produced important findings concerning the decrease in overall sewage contamination in response to the 1972 Clean Water Act, the increase in pesticide concentrations during spring and early-summer runoff, the ubiquitous occurrence of the herbicide atrazine in the Basin, and the persistence of PCB's in River sediments despite their being banned in 1972. As a historical note, Dr. Meade compared many of his own findings with the geomorphic and hydrologic observations made in 1803-05 by Lewis and Clark.

Dr. Meade's subsequent research took him to the Ob' and Yenisey Rivers in Siberia, and the Yukon Basin in Alaska, where his findings regarding sediment transport and deposition added to the growing global database of sediment transport in major rivers.

Dr. Meade was selected by the USGS as the 1999 Mendenhall Lecturer because of his world-class research on the movement and storage of sediments and pollutants in numerous large rivers across the globe. He has also been named a Fellow of the Geological Society of America. In four decades with the USGS, Dr. Meade has written more than 80 articles and publications, including articles for Science and Nature.

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Throughout his career Dr. Meade has been generous with his time and expertise in serving as a mentor and advisor for scientists in the developing stages of their careers. He has also been active in national and international organizations seeking to advance our knowledge base of large-scale hydrology and sediment transport.

In summary, Dr. Meade has dedicated his lengthy career to the improvement of our knowledge of large rivers, their flood plains, estuaries, and sediment transport. Along the way he has helped to point out some significant trends and developments related to water quality and ecological integrity. To recognize his exemplary achievements, it is our pleasure to nominate him for the AIH 2007 R.G. Wetzel Award.

### **Acceptance by: *Dr. Robert H. Meade, U.S. Geological Survey (retired)***

Many thanks to the American Institute of Hydrology for singling me out for the 2007 Edition of the R.G. Wetzel Award. I'm going to switch very soon from first-person singular to first-person plural because the things that were so nicely recounted in the citation were almost entirely due to the happy circumstance of my having hitched my wagon early on to that "Great Engine of Research" (In G.K. Gilbert's words), the US Geological Survey. I do not deny my own culpability in providing much of the necessary vision, passion, and stubbornness, but let me point out a couple reasons why the kind of comprehensive water-quality investigations for which I am being commended might have been a lot less possible in a context other than USGS.

First, tradition. Some of us like to push the notion that we can trace this comprehensive and integrated approach to river science back at least 200 years to Lewis and Clark But perhaps we should settle here for one century instead of two, by anchoring the roots of comprehensive river-quality studies in USGS to the work of R.B. Dole and Herman Stabler that began to appear as the 19th Century rolled into the 20th. And in the generation of USGS scientists that preceded ours, the notion of rivers as complex entities, rather than just a number of isolated problems to be studied individually by engineers, geologists, and chemists who didn't necessarily talk to each other, got a huge boost from people such as Luna Leopold, Walt Durum, Jim Culbertson, and Herman Feltz. So when we started talking up the Mississippi River study within USGS in the late 1980s, we had plenty of tradition to stand on.

Second, an assemblage of colleagues for whom doing good science and getting the numbers right were not only a deep personal commitment, bordering on compulsion, but also a Public Trust. We have so many representatives of so many disciplines within USGS, equipped with awesome expertise and good laboratories, each with his or her own metaphor for what a river really is. Once this critical mass starts perking, there's no stopping it -- especially when a bunch of us are crammed together on a 20-meter research vessel somewhere out on a big river. And it also attracts folks from other agencies and from universities that want to be part of the mix. If you want a more specific idea of who and how many were actually involved, I invite you to look into our Mississippi River report (USGS Circular 1133), particularly at the list of chapter authors (there were 25 of us) and the page and a half of Acknowledgements. When I use the first person plural, these folks constitute the "we" I'm talking about.

Thanks for believing our numbers and listening to our opinions about what they meant. And thanks again for this award, which tells us we might just have deserved all the fun we had working on the big rivers.