

Global Scale Sensor Networks – Opportunities and Challenges John Orcutt

While research in sensorwebs often focuses on extremely low-power, inexpensive sensors coupled with ad hoc, occasionally-connected networks, the recent tragic tsunami associated with the Sumatra earthquake leading to the loss of more than 280,000 lives in the Indian Ocean demands a fresh look at networks and grids on a global scale often involving highly sophisticated sensors. The extraordinary growth in network bandwidth coupled with initiatives such as the not-for-profit National Lambda Rail has enhanced grid computing and grid storage technologies making a truly global sensorweb not only possible, but also imperative. The same system lowers most barriers to scientific research on vast amounts of new data and lowers the costs of operations and maintenance. The Earth and planetary sciences are moving toward an interactive global observation capability necessitating a new generation of cyberinfrastructure. At UCSD and Scripps NSF ITR projects including ROADNet, LOOKING, and the OptIPuter are prototyping real time control of remote instruments, visualization of large data objects, metadata searching of federated data repositories, and collaborative analysis of complex simulations and observations. A single-purpose national or global warning system, for tsunamis for example, is nearly impossible to maintain because of the time scales of major events – decades to centuries. However, a broad, scientifically based, multipurpose system can be maintained and will grow as new technologies become available and new approaches in cyberinfrastructure replace the old.

Biography

Prof. John A. Orcutt is the Deputy Director for Research at the Scripps Institution of Oceanography, heads UCSD's Center for Earth Observations and Applications, and is President of the 44,000 member American Geophysical Union (AGU). He served as Director of the Cecil and Ida Green Institute of Geophysics and Planetary Physics for 18 years. Prof. Orcutt is a graduate of Annapolis (1966) and received his M.Sc. in physics as a Fulbright Scholar at the University of Liverpool. He served as a submariner and advanced to the rank of Commander. He received his PhD in Earth Sciences from Scripps (1976). He has published more than 140 scientific papers and received the Ewing Medal from the USN and the American Geophysical Union (AGU) in 1994. He received the Newcomb-Cleveland Prize from the AAAS in 1983 for a paper in Science. He is one of nine Secretary of the Navy/Chief of Naval Operations Oceanography Chairs. He is the Principal Investigator of two major National Science Foundation Information Technology Research grants: Real-time Observatories, Applications and Data management Networks (ROADNet) and Laboratory for Ocean Observatory Knowledge Integration Grid (LOOKING). He is a co-PI with Professor Larry Smarr of the OptIPuter grant. He was the Chair of the NSF/CORE Dynamics of Earth and Ocean Systems (DEOS) Committee with an interest in extending long-term observations to sea – a permanent presence in the oceans. He is currently a member of the ORION (Ocean Research Interactive Ocean Network) Executive Steering Committee. He was recently a member of the Science Advisory Panel to the President's Ocean Policy Commission. He was elected to the American Philosophical Society in 2002; the APS was founded by Benjamin Franklin in 1743.