

INTERVIEW WITH VICE-ADMIRAL C. LAUTENBACHER JR., US NAVY (RET.)

Vision for a Better World: Integrated Coastal, Ocean and Earth Observation

A graduate of the US Naval Academy, Vice-Admiral Conrad C. Lautenbacher Jr. has masters and doctoral degrees in applied mathematics from Harvard University. Before joining NOAA he was president and CEO of CORE, the Consortium for Oceanographic Research and Education. As commander of US Naval Forces during Operations “Desert Shield”™ and “Desert Storm”™ he was responsible for Navy planning and participation in the air campaign and pioneered the use of information technology to mount large-scale operations using sea-based command and control.

As not all our readers are familiar with US organisations, could you briefly describe CORE and NOAA?

NOAA, the National Oceanic and Atmospheric Administration, is the largest agency within the US Department of Commerce. Our headquarters are in Washington, DC. NOAA has a huge reach. From the deep ocean to the surface of the sun, there is no part of earth that NOAA is not investigating and forecasting. Our mission is to understand and predict changes in the Earth’s™ environment and conserve and manage coastal and marine resources to meet economic, social and environmental needs. NOAA’s™ strategic plan presents a vision in four critical areas - ecosystems, climate, weather and water, and commerce and transportation. We are committed to fostering science-based management that will generate sound policy beneficial to human and economic health for many generations to come.

CORE, the Consortium for Oceanographic Research and Education, is a Washington DC-based association of 74 national oceanographic research institutions, universities, laboratories and aquaria. Its National Oceanographic Partnership Program is a co-operative effort among fifteen federal agencies, academia and private industry to co-ordinate oceanographic research and educational programmes.

Would you describe for us the role of Under-secretary of Commerce for Oceans and Atmosphere and the NOAA Administrator? Do the roles differ and is the under-secretary automatically Administrator of NOAA?

The Under-secretary of Commerce for Oceans and Atmosphere serves as the NOAA Administrator. Being at the helm of this pre-eminent 12,400-staff science and service organisation is a wonderful challenge. NOAA staff recognise that they are examining, predicting and directly addressing critical social and economic needs across the US, and in many instances the world, and this is a stimulating context within which to work. My vision and commitment are to lead NOAA scientifically and operationally in the same interrelated manner as the ecosystems that we observe and forecast. Today NOAA has many crosscutting areas, and team talent, funding and management are ensuring that voices for a range of earth sciences are being heard around the same table. Climate issues, for instance, cut across all line offices, and NOAA’s™ management structure now reflects that reality. The same is true of other areas, such as habitat restoration, ecosystem research, air quality, environmental modelling, and weather water science and technology.

Why is NOAA part of the Department of Commerce? Does this imply that its activities are governed by commercial considerations, or is that an incorrect assumption? Is NOAA focused only on US territory or does it have a global mission?

Our practice is one of science-based management. We believe that sound science is critical to sound policy and management and that this approach provides a solid foundation for a healthy economy. Placed within the Commerce Department at its inception in 1970, NOAA annual efforts do affect a tremendous portion of our economy - US\$ 3 trillion, or about one-third of America’s™ annual Gross Domestic Product. The National Weather Service comes under NOAA and during a typical hurricane season, forecasts, warnings and associated emergency response result in savings of US\$ 3 billion. Coastal and marine communities support over 28 million jobs, generate US\$ 54 billion in goods and services and contribute US\$ 30 billion to the US economy through recreational fishing alone – and NOAA staff work continually with state and local partners to help keep these coasts healthy.

While much of NOAA’s™ mission is national, our vision and some of our mandates are global and collaborative; international efforts cover the spectrum of NOAA expertise. These efforts range from bilateral technical assistance projects, such as the Red River Forecast System in Vietnam, to regional efforts, such as participation on the Arctic Council. As an outcome of last year’s™ World Summit on Sustainable Development, we are engaged in a “White Water to Blue Water Initiative”™ designed to promote integrated watershed and ecosystem approaches to management through partnerships in the Wider Caribbean Region.

What is meant by integrated coastal, ocean and earth observation? What is your view of this concept?

We must work toward making our knowledge of Earth as vast as Earth itself, and the challenges are too huge and interrelated to tackle on a piecemeal basis. Right now there are many thousands of individual technological assets working around the globe and they are yielding a host of benefits, for example:

- Swifter, more precise weather forecasts
- a six-month El Niño heads-up
- and US\$ 15 of value for U.S. farmers for every US\$ 1 invested in weather forecasting

But just as a doctor needs to take many measurements before gauging a person's health, earth scientists and others must have a comprehensive architecture and open exchange of relevant data to begin filling in the "blind spots". To form a comprehensive picture of Earth's many systems and how they interrelate, the international community must work collaboratively to connect all of the individual technology and plug up the holes in our scientific understanding. That is the goal of global efforts aimed at linking technology into one comprehensive, integrated system.

Last June at the OI Americas 2003 Conference you forecast the kick-off of better global observing at the Earth Observation Summit to be held in Washington DC the following month. Did that kick-off occur? Will this new observing system provide opportunities for ocean industry and hydrographic surveying companies?

The Earth Observation Summit held on 31st July in Washington has been called an historic success. I am very pleased that over thirty countries, plus the European Commission, adopted by consensus a Declaration calling for action in strengthening global co-operation. Three additional countries have since joined the effort. This framework for a ten-year implementation plan is being developed and will be ready for a spring 2004 meeting in Tokyo.

The development of an integrated system offers many opportunities for partner and customer vision, development and application. Researchers, developers, testers, manufacturers and suppliers of technologies, platforms, sensors and related equipment will be vital. There is a need to develop and deploy in situ autonomous sensors and systems that can efficiently record and communicate a variety of phenomena on a continuing basis. Understanding the geography of the seafloor and the influence of this upon ocean phenomena will require expertise in modelling and managing digital geographic data. Integrating real-time observing system data and models with Geographic Information Systems will also be vital.

We observe, measure, record and evaluate with many observation systems and in many ways. Can you give some examples whereby we might use the outcome of Earth Observation Systems for humankind?

Imagine the effects of knowing how severe next winter will be, or where the next outbreak of West Nile virus will hit. Improving weather forecast accuracy in the US by just one degree would cut annual electricity costs by at least US\$ 1 billion. With better forecasts and observations the commercial aviation industry would save about US\$ 1.7 billion annually. Up-to-the-minute accurate forecasts of travel and road conditions could be available in every vehicle on our highways. Real-time monitoring and water quality forecasting in every watershed and accompanying coastal area would provide agricultural interests with forecasts and immediate feedback about the correct amount of fertilisers and pesticides to use in maximising crop generation at minimum cost. Air quality monitoring systems would provide real-time information, as well as accurate forecasts days in advance, allowing for effective transportation and energy-use planning and saving lives and avoiding losses in productivity worth many billions of dollars.

There will come a day when sea areas around the US are surveyed with modern survey techniques. How do you see the next steps: monitoring using new techniques like SAR bathymetry and laser or actual surveying using ships or perhaps AUVs?

The NOAA National Survey Plan for nautical charting designates 500,000 square nautical miles of the US EEZ as being significant to navigation. Our goal is to survey all significant areas using full-bottom coverage technology and to maintain a re-survey cycle in those high traffic areas where silting or other forces alter the seafloor. Along with our private sector partners, NOAA accomplishes most hydrographic survey coverage using side-scan and multibeam sonar systems. These systems are relatively mature and yield excellent results. Through contracts NOAA has also surveyed relatively small areas using bathymetric LIDAR technology. This emerging technology can also yield excellent results but is sensitive to environmental conditions such as water clarity, depth, cloud ceiling and wind. As emerging technologies, SAR and AUV show promise. NOAA will test and evaluate an AUV system next year.

This year the US is to become a fully participating member of UNESCO's International Oceanographic Commission (IOC). Why has this not happened earlier?

The US maintained membership of the IOC despite an eighteen-year absence from UNESCO. The US made annual voluntary monetary and in-kind contributions during that period and served on the Executive Council. With US re-entry into UNESCO we will continue our engagement with the IOC and I look forward to the opportunity to develop stronger ties with other UNESCO programme areas, such as fresh water.

You recently recommended Captains Sam De Bow and Rich Behn for promotion to Rear Admiral. Does this mean that the NOAA Corps will continue?

Absolutely; the NOAA Corps will continue. The NOAA Corps may be the smallest of our seven uniformed US services but it is a vital part of NOAA work, and the U.S. Congress has authorised its growth. NOAA Corps officers are trained in engineering, earth sciences, oceanography, meteorology, fisheries science and related disciplines. Officers operate ships, fly aircraft, manage research, conduct diving operations and serve in important staff roles throughout NOAA. The promotions of Captains De Bow and Behn are in process and the 104th Basic Officer Training Class began in September. For more details please see www.noaacorps.noaa.gov/

As a high-ranking representative of the public sector, how do you view the private sector of our hydrographic surveying profession?

NOAA partners with private-sector firms to supplement in-house capabilities to acquire hydrographic, geodetic and photogrammetric data. We both welcome and need this important support. We learn from each other and I believe the shared commitment and exchange of technology and ideas have served both sides well.

<https://www.hydro-international.com/content/article/vision-for-a-better-world-integrated-coastal-ocean-and-earth-observation>
