INTERVIEW WITH CAPTAIN ANDY ARMSTRONG

Hydrographic Research and Education in the USA

In her July/August 1999 issue Hydro international (HI) interviewed Captain Andy Armstrong. The interview was focused on New Approaches, Products and Technology in NOAA. Captain Armstrong announced his move to New Hampshire to start working as Co-Director on the Joint Hydrographic Centre (JHC) and the Centre for Coastal and Ocean Mapping (CCOM) to be established. What happened to the ambitious plans? HI interviewed him once more on progress and realisation of the original plans and his views on the hydrographic future in general.

Please give our readers a summary of the development of CCOM/JHC since the previous interview in July/August 1999, your role in that development and your other hydrographic activities.

In July 1999, I arrived in New Hampshire to establish the Joint Hydrographic Center, a co-operative partnership between the National Oceanic and Atmospheric Administration (NOAA) and the University of New Hampshire (UNH). The UNH Co-Director, Dr Larry Mayer, and I were charged with developing a centre of excellence in hydrography and ocean mapping, with emphasis on both research and development and advanced education. Along with the JHC, UNH started the Center for Coastal and Ocean Mapping, a complementary organisation to extend the range of partnership beyond NOAA to the private sector, other universities, and other government agencies. We opened the centres in January 2000 with 5 faculty members, 5 research scientists and 2 students. Today, with increased support from NOAA and many other sources, we have grown to over 50 faculty, staff, and students. I think we have been quite successful, our initial research programs in sonar technology, multi-beam data processing, data visualisation, data blending and fusion, and new applications for ocean mapping technology have grown and transformed into a comprehensive research program addressing all aspects of hydrography, ocean mapping, and data visualisation, including, among others, seafloor habitat mapping, UNCLOS Article 76 mapping and data analysis, and future concepts in electronic charting. Our education program is offering M.S. and Ph.D. degrees in Ocean Mapping, and has been awarded Category A recognition by the FIG/IHO/ICA International Advisory Board. In addition to our degree programs, we are offering a â€˜certificateâ€™ program in ocean mapping, which is the base for our GEBCO/Nippon Foundation fellowships in bathymetric mapping, an ongoing program that is supporting 5 to 7 international students annually for advanced education in ocean mapping. After completion of their fellowship at UNH, these individuals will return to their countries prepared to support regional efforts to improve the state of global bathymetric mapping.
In addition to my work at JHC, I have remained involved in NOAAâ€™s hydro-graphic programs. I am a member of NOAAâ€™s Hydrographic Services Review Panel, a formally chartered advisory board created to provide advice to NOAA on their full range of hydrographic programs and services; and I am active in The Hydrographic Society of America (THSoA) and the IFHS. I also serve on the FIG/IHO/ ICA International Advisory Board on Standards of Competence for Hydro-graphic Surveyors and Nautical Cartographers.

The U.S.A. have several government departments involved in oceanographic and hydrographic investigations. In how far do they meet in CCOM/JHC and how is the co-operation with the private industry?

While NOAA is our principal government partner, we are fortunate at CCOM/JHC to be working with many other agencies with ocean and seafloor related missions. The Center is working on projects funded
by the U.S. Geological Survey, the Office of Naval Research, the Naval Research Laboratory, the Naval Oceanographic Office, the U.S. Army Corps of Engineers, and the National Science Foundation. By working on hydrographic and ocean mapping projects funded by several government agencies, we are able to leverage the results of all our projects for the greatest overall benefit of the U.S. taxpayers and the hydrographic community as a whole. CCOM also maintains a strong relationship with private industry. The Center interacts with a very wide range of private sector organisations. Many of these interactions are formalised through a signed industrial consortium agreement. The CCOM industrial consortium includes leading companies in the equipment, software, services, and surveying segments of the hydrographic and ocean mapping industry. The industrial consortium is one of the mechanisms by which the results of research and development at the Center are transferred to the hydro-graphic community. Implementation of the CUBE algorithm, developed at CCOM/JHC by Dr Brian Calder (The International Hydrographic Review, April 2003), in the commercial hydrographic data processing software of several consortium members, is an example of the effectiveness of this co-operation with industry.

The US Hydro Conferences have always been successful, but US Hydro 2005 seems to have broken a record. Is the latter a once only affair or the result of a steadily growing interest in hydrography?

I believe that U.S. Hydro 2005, profiled in your May 2005 edition, did set a record for Hydrographic Conference attendance with over 500 registrants. While much of the credit is due to the hard work of the volunteer organising committee, and the excellent venue in San Diego, I believe that U.S. Hydrographic Conferences will continue this attendance trend when we hold our next Conference in Norfolk, Virginia in May 2007. I think interest is steadily growing in hydrography because hydrographic technology is steadily growing in application and scope. As the dual name and the varied research programs of our Center suggest, there is a broader â€˜ocean mappingâ€™ concept that is merging with the more traditional â€˜hydrographicâ€™ discipline associated with nautical charting. This broader array of activity, and the opportunities and challenges that come with it, cannot help but increase the interest and participation in our field.

In your editorial of Sea Technology, February 2005 issue, you elaborated on "transition to integrated ocean mapping" as the main topic for US Hydro 05. What was the response on the Conference to this challenge?

A quick look at the technical program presented at Hydro 2005 suggests that the basis for this transition is in place. The first dayâ€™s sessions had papers on military hydrography, fisheries habitat mapping, UNCLOS mapping, lidar bathymetry, search and recovery, and nautical charting hydrography, certainly a wide array of hydrographic and ocean mapping topics. A deeper look at many of the papers presented during the conference reveals that the projects or technology reported used similar equipment, similar personnel, and similar vessels, whether they were â€˜hydrographicâ€™ projects and technology for nautical charting or â€˜ocean mappingâ€™ projects and technology for resource assessment. The next step, the big step, is to implement practices to ensure that, for example, when organisations do seafloor mapping for resource assessment, they also acquire data suitable for nautical charting; and likewise, that when hydrographic offices do surveys for nautical charting, they also acquire data suitable for seafloor characterisation and habitat mapping. In discussions with hydrographers and ocean mapping scientists during the conference, and afterwards, I am convinced that the challenge has been taken up, and that integrated ocean mapping will become the standard mode of operation for hydrographers.

Please give our readers some information on the U.S. Commission on Ocean Policy you referred to in the afore mentioned editorial. Has the Commission taken any specific action after the recent tsunami?

The Oceans Act of 2000 created the U.S. Commission on Ocean Policy, whose 16 members were appointed by the President of the United States, and directed it to carry out a comprehensive review of ocean-related issues and laws. In September 2004, the Commission submitted their report with 212 recommendations. The Commission completed its work before the recent devastating tsunami. The Commission report may be found at www.oceancommission.gov/. In response to the commissionâ€™s Report, the U.S. Administration has issued the U.S. Ocean Action Plan, available at http://ocean.ceg.gov/actionplan.pdf. Of significance to hydrographers and ocean mapping professionals, the Ocean Action Plan calls for accession to the U.N. Convention on the Law of the Sea, an integrated Ocean Observing System as part of an international Global Ocean Observing Systems, and the development of a National Oceanographic Fleet Renewal Plan as well as new vessels for ocean exploration and hydrographic survey.

You are Chairman of both the Hydro-graphic Society United States (HSUS) and the Hydrographic Society of America (THSoA). What are your views in this context on the recent transfer of the Hydrographic Society (THS) into the International Federation of Hydrographic Societies (IFHS)?

I am encouraged by the recent transformation of THS into IFHS. I believe the IFHS is a much better model for encouraging and supporting the exchange of information among hydrographers worldwide, and for fostering development of hydrographic capabilities in the national and regional areas served by member Societies. Also, I believe that independent national or regional societies with formal international connections at the organisational level, will be most responsive to their individual membersâ€™ needs.

As a result of the start of the IFHS do you foresee a re-union between HSUS and THSoA or can it create a conflict of interest between the two parties?

Members of the Boards of HSUS and THSoA met separately during Hydro 2005, and both Boards recommended that HSUS become a subset, probably a Chapter, of THSoA. While this has not been without some challenge, the details of this process are under discussion in both organisations.

You are also Chairman of the FIG/IHO/ICA International Advisory Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers. Have the views of the Advisory Board on personal certification changed in the last year? Where there any particular decisions taken in the recent Board meeting?

In the past two years, the Advisory Board has been receiving inquiries from several sources regarding the possibility of recognising individual certification. Clearly there is an unfulfilled need in our profession for some generally accepted standards of personal competence. The Advisory Board recently met in Athens, Greece, and devoted considerable discussion to the issue of individual recognition schemes. The Board is in agreement that it will not take on the role of individual recognition or certification. However, the Board has decided to examine a proposed individual competence scheme developed by the International Marine Contractors Association to determine the degree to which this scheme corresponds or addresses the competencies maintained by the International Advisory Board and outlined in IHO Publication M-5, Standards of Competence for Hydrographic Surveyors.

To what extent are hydrographic students inspired by the environmental aspects of hydrography?

From my experience here at UNH, the environmental aspects of hydrography may be inspiring more students than the navigational aspects of hydrography. This is not to say that traditional navigational issues have been diminished, only that the entire subject area is growing, and that environmental aspects are a large part of that growth. The concept of ecosystem based management of our marine resources is taking hold in the United States, and my belief is that we cannot manage ecosystems if we have not systematically mapped them. This will create enormous opportunity for hydrographers and ocean mappers.

What is the employment situation in the U.S.A. for hydrographic surveyors in general and junior/starting ones in particular?

Iâ€™m not directly involved in the employment situation, but by way of answering that question, I will note that in my role at UNH, I regularly receive inquiries from industry employers looking for hydrographically trained graduates of our educational program.

What sort of message would you like to pass to youngsters seeking a career in hydrography?

When I was thinking of a career, I thought that the best possible job would be one that involved science and engineering and paid me to be on a boat at the same time. I feel fortunate to have found that combination in hydrography. I would say that these are still valid criteria that might lead someone to a career in hydrography. And, from an economic perspective, I think hydrography and ocean mapping are growth fields that will support a growing number of professionals.