



## REPORT ON POGO VISITING FELLOWSHIP PROGRAMME 2011

### Report from the Visiting Professor

**Name of Visiting Professor:** Dr. Walker Smith

**Name of Host:** Dr. Nguyen Ngoc Lam

**Host institution:** Institute of Oceanography, Nha Trang, Vietnam

**Dates of Training:** March, 2012

**Subject of Training:** The Use of Fluorescence in Oceanography

**Please provide a brief description of activities undertaken during the visiting professorship period. Please include elements of formal training (e.g. lectures, practicals and field trips) as well as research collaboration, if applicable**

*The course was organized as follows: lectures in the morning (1.5 – 2.0 hours each), followed by a laboratory exercise through lunch, then an afternoon laboratory that largely used experimental approaches using fluorescence. Lectures included material ranging from simple fluorescence measurements of chlorophyll a to active fluorescence to using fluorescence from space, and were all presented using PowerPoint presentations (which were provided to all students). All laboratory exercises were provided to the students in hard copy and electronically. The schedule was flexible, as we also were able to have a number of field trips to collect samples from the local bay to illustrate the variations of fluorescent properties in time and space. A detailed literature summary was also provided to students. Students also presented and discussed their results as a group at the end of the class. A short presentation by Dr. Doan Nhu Hai of ION reinforced to students the use of fluorescence in Vietnamese waters.*

*The students were exposed to a variety of oceanographic and laboratory techniques. A Turner Designs Model 10 AU Fluorometer (provided by Mr. Tong Phuoc Hoang Son, a coordinator of a prior POGO project at ION) and a dual-beam Labomed spectrophotometer were used in the laboratory, and on the field trip a Seabird 19Plus CTD system equipped with photosynthetically active radiation, optical backscatter, pH, and fluorescence (WETLab) sensors was used in a transect from river mouth to Nha Trang Bay. Water samples from stations were collected for laboratory analyses. Students were grouped into smaller teams and processed data from CTD and water samples.*

**How do you think the training was received by the students? Did it meet its objectives? What do you think the students gained from the training? Was the students' level as you had expected?**

*The training was successful in student understanding/knowledge obtained, although a few students struggled with English that was used in lectures and class. The instructor (Smith) was available to all students for individual discussions and clarification, and through these discussions he felt that the material was "making sense" to most of the students. Indeed, it was apparent that each student was relating the material discussed in lecture and laboratories to his/her own field of expertise. The course structure (alternating between lectures and labs) allowed for an informal atmosphere, and there was a good interaction among the students which facilitated understanding of the main topics. The course was useful as it covered the essentials of fluorescence (both theory and application). The students were from different backgrounds (recent Ph.D. graduates to Ph.D. students) and institutions, so the knowledge gained from the course will be benefit their own careers beyond ION. I would expect that a number of them will use the information and material provided in the classes they will teach. In summary, I believe*

*the objectives of the course were completely met and that the course was a success.*

*I was extremely pleased (and surprised) at the students' abilities and interest level. As with any course, there was a substantial variation, which was compounded by language issues. I have had experience with Chinese students, and I found the Vietnamese students to be a) more inquisitive, b) more willing to ask questions, and c) hard workers and diligent. They were fun to interact with, and made things easier for me.*

**Did you encounter any obstacles to the implementation of your planned training/ research activities? Do you have any recommendations for future capacity building initiatives in the same institute/country, building on your experience and on any problems you may have encountered?**

*Working in a country with a developing scientific base can be challenging, but working at ION made things much easier. They provided a well equipped laboratory and computer system access, and also had equipment for use in the course. Logistics were simple to arrange by the local contact. The biggest obstacle that I had was the lack of knowledge of who might be participating in the course, and their level of knowledge. But that is true in any course. Planning across the Pacific was also challenging, but electronic means were adequate. A pre-class visit might have been beneficial to the instructor, but may not have been worth the cost. Frankly, I'd be happy to offer the same course (or a similar one) at ION; it is a perfect setting for students. There might be some difficulty in obtaining some chemicals in Vietnam that are available to other nations, but this was not an issue for us.*

*There are a number of oceanographic initiatives that are being developed globally that might be appropriate for possible future courses, such as:*

- Sampling strategies and the influence of temporal/spatial variability in oceanographic research*
- Remote Sensing of coastal oceans*
- Ocean observatories*

**Do you envisage that any future collaborations (e.g. publications, proposals, future visits, student exchanges) will result from this visit? Please provide details**

*Most definitely. I had worked with Dr. Nguyen and his group previously on a grant supported by the US NSF, and have greatly enjoyed that experience. The POGO course added to that interaction, and was also a wonderful personal experience. We have submitted one paper (to Deep-Sea Research) from the NSF grant, and anticipate others soon. Our collaborations have expanded, and I can envision working with ION for many years. I certainly plan on submitting proposals to US funding sources to do so (e.g., NSF Biological Oceanography; Office of Naval Research). I also will visit this summer (briefly) to continue work on a secondary collaboration with Dr. Doan Nhu Hai (who participated in an NSF sponsored cruise to the Ross Sea this past year).*

*I would welcome the opportunity to host students/post-doctoral associates in the US from ION or Vietnam, given my very positive impression in the class. Funding would remain the most difficult issue, but I would hope to pursue that option in the near future. Any suggestions from POGO and its staff would be greatly appreciated.*

**Please provide a brief overview of the host institution's research and teaching facilities and any specific areas you can identify that would benefit from particular support**

*ION has a very new building that was built with Danish assistance and houses the Plankton Ecology group. I believe this group is the best known section (internationally through its research) of any in Vietnam. It has good laboratories and computer facilities, as well as decent rooms for teaching. Minor issues were at times a problem (e.g. lack of a blackboard or dry board for the instructor to write on), likely reflecting budgetary constraints of the Institute. They do not have an instrument for measuring active fluorescence (PAM or FRRF), which might be useful. But in general, it is an **excellent** facility for research and teaching.*

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