Ocean monitoring

Collaborations between Europe and China…

A Specific Support Action (SSA) has been initiated between Europe and China with the overall goal to establish an inventory of Chinese and European capacities in marine monitoring for environment and security including routine use of Earth observation data. The project, named DRAGONESS (DRAGON in support of harmonising European and Chinese marine monitoring for Environment and Security System) is funded by the European Union's (EU) Framework Programme 6 for a three years' period running from September 2007 to August 2010. Researchers from the two continents will deliver the inventory in the contexts of need and challenges identified within international programmes such as Global Ocean Observing System (GOOS), Global Earth Observing System of Systems (GEOSS), and Global Monitoring for Environment and Security (GMES). In so doing, the DRAGONESS project aims to:

- Identify observation capacity, monitoring gaps and barriers;
- Assess existing Chinese and European information products and services arising from integrated use of remote-sensing and in situ observations, models, and data assimilation methods;
- Investigate the possibility for existing and foreseen services to be exchanged between the two continents for necessary regional development and implementation;
- Stimulate initiation and exchange of new European-Chinese partnership in Earth observation science and technology in support to global monitoring for environment and security.

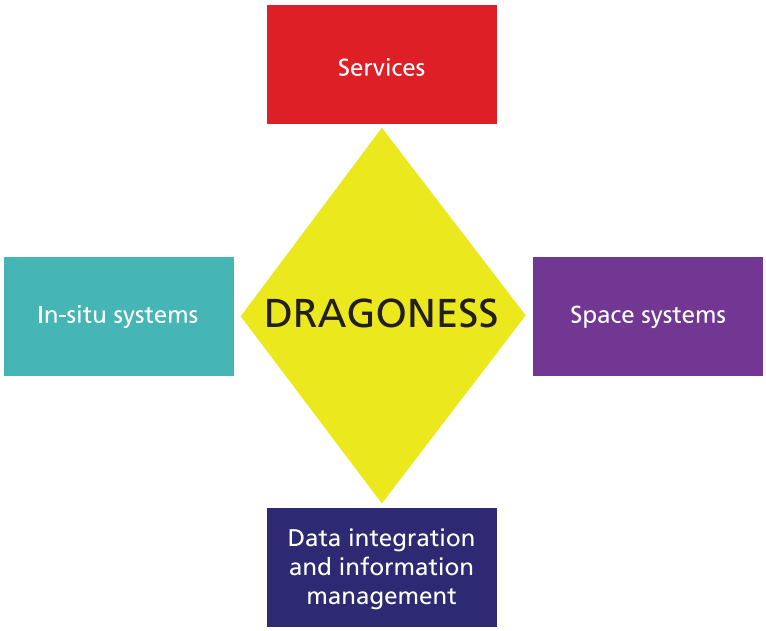

Fig. 1: The DRAGONESS work packages and functionalities emphasised in the context of the GMES diamond

These specific aims extended with some preliminary results were highlighted at a training course and a symposium, hosted in respectively Hangzhou and Beijing from 15-20th October 2007 and 21-25th April 2008. In addition the project objectives and workplan were announced in the EOS Transactions published by the American Geophysical Union (Volume 89, Number 20, 13th May 2008).

DRAGONESS is both benefiting from and complementing the joint European Space Agency (ESA) and China's Ministry of Science and Technology (MOST) Dragon collaborative programme that focuses on Earth observations from satellites. Dragon will run until 2012. A more detailed description of the DRAGONESS project background, objectives, tasks, milestones and partners is available at http://dragoness.nersc.no. This website is also offering a direct link to further detailed information about the ESA-MOST collaborative Dragon programme.

The execution of the five dedicated project work packages including:

- Review of in situ observing systems;
- Review of space borne observing systems;
- Specification of data integration and information management;
- Specification of ocean and coastal information products and services;
- Capacity building are therefore highly relevant.

is highly relevant in the context of assessing the capabilities for forecasting and tracking extreme events, aiding operational oceanography, monitoring water quality, tracking

pollution and monitoring climate change. It is also clearly relevant in connection with the so-called GMES diamond-type illustration shown in Fig. 1. Moreover, for the development and operation of environmental monitoring system and information services, such as on the GMES Marine Core Services project MyOcean funded by the EU Framework Programme 7, it is of utmost importance to agree on common standards, measurement platforms, protocols, data format, metadata format, quality assurance/quality control procedures, data integration and data portal infrastructure. This was emphasised at the first annual progress meeting held at the Nansen Environmental and Remote Sensing Center (NERSC) in Bergen, Norway from 17-19th September 2008.

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During the first year we have gradually established a comprehensive overview of the Chinese satellite and in situ observing capacities for coastal oceans, shelf seas and the open ocean. In particular, the P.R. of China satellite programme and plans up to 2020 are covering the launch of more than 20 satellites dedicated to disaster monitoring, meteorological observations and ocean monitoring. In addition a range of coastal and shelf sea models, some with downscaling procedures, are operated for marine meteorology application and services, sea ice forecasting in the Bohai Sea and dedicated water quality and red-tide monitoring and forecasting. Data are mostly available for research and development, while restrictions usually apply for near real-time access.

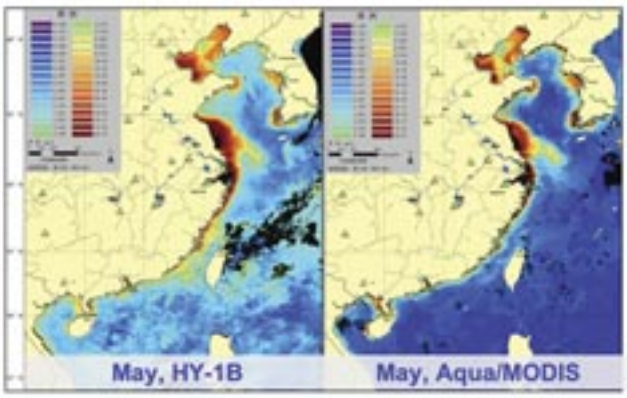

Fig. 2: Total suspended matter from HY-1b (left) and Aqua MODIS (right) (Courtesy of P. Delu, SIO/SAO, Hangzhou, China)

Regarding dissemination of information and services, the use of web servers is also gradually emerging, although only graphical information is possible to download. A world-wide harmonisation of Earth observing satellites, which must include incorporation of Chinese Earth observing satellites, is indispensable. The DRAGONESS project, in complement to Dragon programme, should constitute an essential step in this direction. All in all China could therefore ensure a significant contribution to GEOSS.

In Figure 2 we see the comparison of distribution and pattern of monthly mean total suspended matter for May 2007 derived from the Chinese satellite HY-1B (left) and US Aqua MODIS (right) covering all Chinese coastal and regional seas. For the coastal regions the overall agreement and locations of local maxima as, for instance, depicted in the Yangtze River mouth and estuary are very good and spans across values from 0 to 90 mg/l of total suspended matter divided into 32 colour bins.

The DRAGONESS partners from Europe include Nansen Environmental and Remote Sensing Center (Norway), GKSS Forschungszentrum and ORS-Consulting (Germany), Institut Francais De Recherche Pour L'exploitation De La Mer and Collecte Localisation Satellites (France). From China the partners are Nansen-Zhu International Research Center, Ocean Remote Sensing Institute, Ocean University of China, Institute of Atmospheric Physics, Chinese Academy of Sciences, National Satellite Ocean Application Service, Beijing Normal University, Ministry of Science and Technology, National Marine Environmental Forecasting Center and Second Institute of Oceanography, State Oceanic Administration.

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