



## Welcome to the PORSEC Bulletin

Dear Reader,

This is the First Issue of the Bulletin of the PORSEC Association. We hope that it will be of value as an organ for communication about remote sensing of interest to PORSEC Association members and about activities of the association and its members. We will have a section on meetings relevant to our membership and a section on job and study opportunities. We plan to publish three issues per year in March, July and October.

Our Association is a small one with some particular attributes. We are truly international in our membership with no particular alliance to one country. From the beginning the PORSEC activities were mostly sponsored by the countries with developed space agencies, but over the past 17 years of its existence more countries have come into the “club” of nations with their own space agencies and the smaller countries, where this kind of technology is still under development and perhaps out-of-reach, are now engaged in using remote sensing for environmental research and monitoring. The PORSEC Mission, which is stated on our web-page: <http://porsec.nwra.com/> includes strong emphasis on capacity building. By that I suggest that today we mean communication of scientific knowledge and facts in a completely multi-directional sense. The current state of the world’s environment and climate requires that people with knowledge and some ability to influence the future of our collective actions to improve the state of our Planet Earth, help one another to do better than we have in the past. Exchange of knowledge, best methods and practices for research and monitoring is important.

We hope that this informal Bulletin will be a means for such communication and exchanges. We solicit hereby your short articles alerting the membership to some valuable paper, data set, insight or just simply news. Reference to the more in-depth sources or how the author can be contacted is encouraged.

Welcome to the readership of the Bulletin of the PORSEC Association!

*Kristina B. Katsaros*  
*President of the PORSEC Association*

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## The Pan Ocean Remote Sensing Conference of 2006 and information about publication

Gad Levy

**The conference was held jointly with the International Society of Remote Sensing meeting as the ISRS2006PORSEC in Busan Korea, Nov. 2-4, 2006.** Our Korean host was the Korean Society for Remote Sensing and we had excellent facilities at the BEXCO center. It was a good meeting with PORSEC holding 8 scientific sessions on scientific applications of Active/Passive Microwave Sensors; Air-Sea interaction and marine meteorology; Ocean Color; Polar and Sub-polar Oceans, SAR and Altimetry; Tropical and Subtropical oceans; Studies in the South China Sea; Tsunamis as well as an applications session on Oil spill monitoring and a Special Session on satellite developments and applications.

The National Aeronautics and Space Administration, NASA, and the Office of Naval Research, ONR provided partial funding to the meeting and the Japan Aerospace and Exploration Agency, the Indian Space Application Center, the Korean Aerospace Research Institute, KARI, and the Canadian Space Agency, CSA, sent their representatives to speak at the later Special Session on Space Agencies. Reports on scientific sessions of the conference are in this issue, as well as the next few issues of the Bulletin. Prior to the meeting, on November 1st, Pukyong National University hosted a PORSEC Scientific Organizing Committee, SOC, meeting and a Tsunami Workshop.

The **Tsunami Workshop** was well attended and Dr. Tom Allan wrote a summary article to appear in EOS (Transactions of the American Geophysical Union), a summary follows below. KARI and the European Space Agency, ESA, organized a capacity building course held the week prior to the conference on the KARI campus in Daejeon (see a separate report in this issue). **A Special Issue of peer-reviewed articles based on the PORSEC 2006 is planned for the International Journal of Remote Sensing.** Deadline for submissions is **30 April 2007**, with a letter of intent containing an abstract due **April 15th**. Papers submitted for this special issue ought to strictly adhere to the IJRS instructions for authors found on the IJRS website <http://www.tandf.co.uk/journals/authors/tresauth.asp>. Letters of Intent should be submitted by email to IJRS-PORSEC (at) [porsec.nwra.com](mailto:porsec.nwra.com) and should include the thematic area code only in the subject line as per instructions emailed separately and posted to the PORSEC web page.

*Gad Levy is the Executive Secretary of the PORSEC Association a scientist at Northwest Research Association Inc.*

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### The Tsunami Workshop 2006

*T D Allan, Workshop Convenor*

In the early morning of December 26th 2004 the ocean research satellite Jason flew over the Indian Ocean and recorded a surface tsunami wave less than 1 metre high. If it was no more than chance that a satellite equipped with a sensitive radar passed over at that precise moment, the potential role of orbiting spacecraft in future early warning systems was established. Subsequently, a synoptic view of the tsunami's devastating impact on coastal resorts was revealed in the optical imagery also observed from space.

This special Workshop was convened to review the performance of satellites and consider the extent to which future space systems could contribute to reducing the impact of marine hazards.

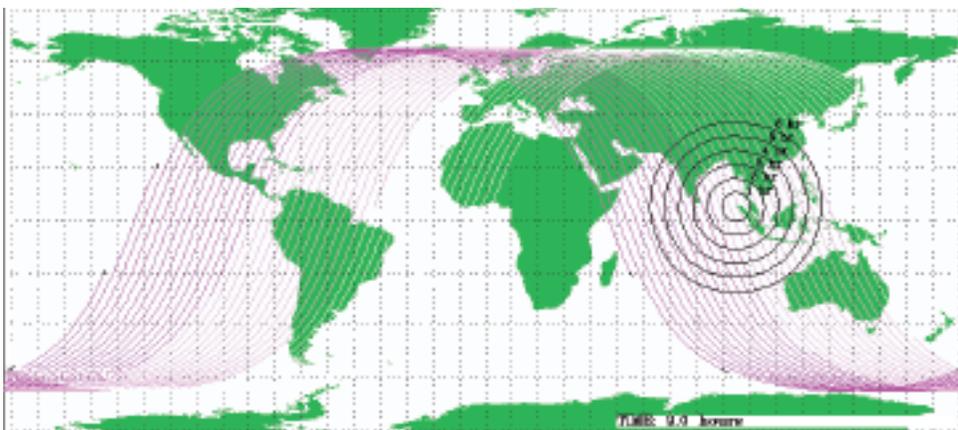
- Speakers from Indonesia (Bambang Trisakti) and Thailand (Absornsuda Siripong) presented graphic images of coastal resorts and demonstrated how this satellite imagery was subsequently used by Indonesian and Thai authorities to define areas of risk, and draw up evacuation plans. Satellite imagery was also used by DanLing Tang of the South China Sea Institute of Oceanology to illustrate the tsunami's effect on regional marine ecosystems.
- Mal Heron from James Cook University, Australia demonstrated how shore-based HF-radar could play a key role in following the approach of a tsunami wave as it moved towards the shore.
- The remaining speakers addressed the issue of how satellites could feasibly be used to improve the early detection

and warning of a range of marine threats with special reference to tsunamis.

- Tony Song from JPL, Pasadena, USA presented evidence from satellite observations that sea-floor uplift from the seismic inversion is not enough to have generated the powerful 2004 Indian Ocean tsunami. Using a three-dimensional coupled earthquake-tsunami model, he demonstrated that the momentum force transferred by the horizontal motions of faulting slopes is the major cause.
- Yuliya Troitskaya from Russia's Institute of Applied Physics presented experimental evidence for space-observed manifestations of the open ocean tsunami in the microwave radar backscatter found in the Jason altimeter record as it crossed the head wave of the tsunami.
- Jim Gower of IOS, Sidney, BC Canada, processed the altimeter data to show how short-wave energy generated by the earthquake was also detected, and could serve as a useful signal for a detection system based on satellite altimetry. He showed signals from the DART buoys now being laid down in selected ocean areas, and demonstrated that these are capable of considerably higher sensitivity than can be achieved by altimetry, partly because the tsunami signal for a Bottom Pressure Recorder may be less affected by ocean mesoscale eddies. In his opinion the relative advantages of DART buoys and satellite altimetry need to be carefully balanced.
- In a written contribution, Yutaka Hayashi from Japan's Meteorological Research Institute, reported his investigations relating the lowest height of the tsunami signal which satellite altimeters can detect. Based on this, and the general relation between the magnitude of a tsunami-inducing earthquake and the height of the wave generated in the open ocean, a satellite mission would have the potential to detect one tsunami in its lifetime, which corresponds to the average interval between major tsunami-inducing earthquakes.
- Tom Allan (Satellite Observing Systems, UK) argued for a constellation of altimeter-carrying microsattellites as the only feasible method of providing uniform global coverage at an affordable cost. He proposed that nations facing the greatest threat from future tsunamis might form a 'club' whereby, for a relatively modest outlay (in terms of space budgets), they would jointly own and acquire access to the observations of the whole constellation of microplatforms, triggered to seek out and track a tsunami wave the instant the worldwide network of seismometers detected an underwater quake.

Under normal daily operations the constellation would continue to transmit regular bulletins of observed surface wind and wave heights to ships and forecasting centres around the globe that would allow storms at sea to be located and tracked with greater precision.

- There were diverse opinions on the extent of signal processing that may be required to detect a high-speed, low-amplitude tsunami wave. Immediately following the Indian Ocean tsunami it had been postulated that this could take a matter of hours, making altimetry a poor choice for a rapid alert system. Other researchers maintained that initial detection could be made almost instantaneously by subtracting from the altimeter profile the historical average of all observations previously recorded along that track.



*This image shows the global coverage that would be achieved by a satellite constellation of 4 satellites in 6 orbit planes.*

Although not discussed in any detail at the Workshop it was recognised that the 2004 disaster had generated renewed research effort into improved understanding of geophysical prediction models. The consensus that emerged from the Workshop was concern over the need to capitalise on the coverage afforded by satellites as part of a more closely integrated, global detection system. Each element of this system – buoy, model and satellite – must be closely evaluated to determine how the strengths and weaknesses of one could be complemented by another.

*T.D. Allan is a researcher at Satellite Observing Systems in U.K.. info (at) satobsys.co.uk. The Tsunami Workshop was held in Busan, South Korea on November 1, 2006 during PORSEC's biennial symposium.*

## Session on Oil Spill Monitoring

Andrey G. Kostianoy, session convener

The Session consisted of three oral talks and two posters.

• Prof. Andrey G. Kostianoy (Russia) gave a talk “Satellite monitoring of oil pollution in the European Seas”. He showed that oil pollution of the ocean is a major environmental problem, especially in its coastal zones. Each year ships and industries damage the delicate coastal ecosystem in many parts of the world by releasing oil or pollutants into rivers, coastal and offshore waters. For natural and man-made oil spills it is necessary to operate regular and operational monitoring. For example, in the Mediterranean, North and Baltic seas it is normally carried out by aircraft or ships. This is expensive and is constrained by the limited availability of these resources, borders between countries, daylight hours, good weather conditions, etc. Satellite imagery can help greatly in identifying probable spills over large areas and then guiding aerial surveys for precise observation of specific locations. The Synthetic Aperture Radar (SAR) instrument, which can collect data almost independently of weather and light conditions, is an excellent tool to monitor and detect oil on water surfaces. SAR is currently on board the ENVISAT, ERS-2 and RADARSAT satellites. Prof. Kostianoy showed examples of the application of this technology to the investigation of oil pollution in the Caspian, Black, Mediterranean, North and Baltic seas. He presented the results of the complex satellite monitoring of the southeastern Baltic Sea, in connection with a beginning of oil production by LUKOIL-Kaliningradmorneft at the continental shelf of Russia (oil rig D-6) in March 2004. Operational monitoring was performed in June 2004 – November 2005 on the basis of daily satellite remote sensing (ENVISAT ASAR and RADARSAT SAR imagery, AVHRR NOAA, MODIS, TOPEX/Poseidon, Jason-1, QuikSCAT) of sea surface temperature, sea level, chlorophyll concentration, mesoscale dynamics, wind and waves, and oil spills. As a result complex information on oil pollution of the sea, SST, distribution of suspended matter, chlorophyll concentration, sea currents and meteorological parameters has been received. In total 274 oil spills were detected in 230 ASAR ENVISAT and 17 SAR RADARSAT images received during 18 months. The interactive numerical model Seatrack Web SMHI (The Swedish Meteorological and Hydrological Institute) was used for an operational forecast of the drift of all large oil spills detected in ASAR/SAR imagery and virtual (simulated) oil spills from the D-6 platform.

• Ms. Svetlana Shcherbak et al. (Russia) gave a talk “Multisensor satellite monitoring of oil pollution in the northeastern coastal zone of the Black Sea”. She demonstrated that operational oil spill detection by SAR runs into the problem of distinguishing oil slicks from look-alikes, such as organic films, wind shadows, rain cells, zones of upwelling, and bloom effects. A combined use of all available quasi-concurrent satellite information (AVHRR NOAA, Jason-1, MODIS Terra/Aqua, QuikSCAT) was proposed to solve this problem. She presented the results of operational monitoring of the coastal zone of the northeastern Black Sea conducted in 2006. This monitoring was based on daily receiving, processing and analysis of data different in resolution



*This picture shows 3 oil spills released from the ships in the southeastern Baltic Sea. The satellite image was obtained from ASAR Envisat, ESA on 25 August 2005.*

*Kostianoy A.G., Litovchenko K.Ts., Lavrova O.Yu., Mityagina M.I., Bocharova T.Yu., Lebedev S.A., Stanichny S.V., Soloviev D.M., Sirota A.M., Pichuzhkina O.E. Operational satellite monitoring of oil spill pollution in the southeastern Baltic Sea: 18 months experience. – Environmental Research, Engineering and Management, 2006, N4 (38), P.70-77.*

and surface coverage (active and passive microwave radar images, optical and infrared data). These data allowed retrieval of information on seawater pollution, sea surface and air-sea boundary layer conditions, sea surface temperature and suspended matter distributions, chlorophyll a concentration, mesoscale water dynamics, near-surface wind and surface wave fields. The focus was on coastal water circulation mechanisms and their impact on the pollutant transport.

- Lijian Shi et al. (China) gave a talk “Using satellite synthetic aperture radar imagery to map oil spills in the East China Sea”. A total of 120 SAR images containing oil spill over the East China Sea were collected, ranging in date from July 23, 2002 to November 11, 2005. After preprocessing, SAR images were segmented by adaptive threshold method and the oil spills were distinguished from look-alike phenomena and incorporated into GIS (Geographic Information System). He demonstrated the oil spills distribution in the East China Sea. The wide-swath and quick-looks SAR imagery for mapping oil spill distribution over large marine areas were proved to be useful when full resolution data are not available. He analyzed temporal and spatial distribution of the oil spills and showed that most of them were caused by illegal discharge along the main ship routes, and that the occurrence of oil spills detected on SAR images acquired during mornings and in the summer was much higher than during evenings and in the winter.

- Two posters were presented by Victoria V. Zatyagalova and Andrei Yu. Ivanov (Russia). A poster “A GIS Approach to Mapping Oil Spills in the Marine Environment” presented a variety of phenomena such as biological surfactants, upwelling, algal blooms, shoals, floating vegetation, man-made spills from ships, platforms or pipelines that can create the slick signatures on the synthetic aperture radar (SAR) images of the sea surface. Manifestations of oceanic and atmospheric phenomena or, so-called, look-alikes, as well as natural slicks have to be removed from consideration based on the appearance of the slick (size, shape, contrast, etc.), their location relative to surrounding objects (rigs, ships, etc.), their orientation relative to wind & current features and their link with oceanic or atmospheric processes. An important help to correctly interpreting the significance of dark signatures is Geographic Information Systems (GIS) and GIS-based databases that include the geographical information about the water basin (coastline, bathymetry etc.) as well as locations of oil fields, platforms, pipelines, major shipping routes, bottom seepages, etc. This approach has been applied to mapping of oil spills in the Caspian, Black, Yellow and East China seas, and in the Gulf of Thailand.

- Second poster “Hydrocarbon seeps and mud volcanoes in the Caspian Sea characterized with use of the Envisat ASAR images” dealt with sea surface manifestations of seepages and marine oil and gas fields. Many discoveries of marine oil fields in the Gulf of Mexico, Persian Gulf, Caspian Sea, etc. have occurred due to discoveries of offshore seeps and seep-related phenomena on the sea surface. SAR techniques allow to detect marine oil seeps and related oil slicks to determine their locations, group characteristics and evaluate their impact on marine environment. An approach allowing mapping oil slicks related to the seepages in the Caspian Sea is based, first, on a set of SAR images acquired over the sea by Envisat satellite. By using computer pattern recognition software and interactive analysis, oil slicks associated with bottom seepages (and mud volcanoes) have been detected, analyzed and processed. In total about 100 seeps having a repeating regime were identified in the southwestern Caspian Sea. Estimates of oil production gave up to 21,000 tones of crude oil per year.

The Session demonstrated that ASAR ENVISAT and SAR RADARSAT provide effective capabilities to monitor oil spills pollution and natural oil seepages from the bottom in the World Ocean and seas. Combined with other satellite remote sensing (AVHRR NOAA, MODIS-Terra and -Aqua, Jason-1, QuikSCAT, etc.) of SST, sea level, chlorophyll concentration, mesoscale dynamics, wind and waves, this observational system represents a powerful method for long-term monitoring of the ecological state of semi-enclosed seas and coastal zones, especially vulnerable to oil pollution.

*Prof. Andrey G. Kostianoy, P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, Russia.*

## Training Course at the Korean Aerospace Research Institute

*A report from the PORSEC Association perspective by Kristina Katsaros*



*Participants and teachers in the KARI training.*

In connection with the IRSR-2006-PORSEC a remote sensing course was offered at the Korean Aerospace Research Institute, KARI, in Daejeon, South Korea, October 25-27, 2006. The course was organized by Dr. Pascal LeComte and sponsored by the European Space Agency and KARI for the main part.

Non-Korean student participation was supported by the capacity building program of the Intergovernmental Oceanographic Commission (IOC) of UNESCO. The PORSEC Association contributed support for the students to remain in Korea and travel to Busan for the PORSEC 2006. Besides Dr. Lecomte of ESA, three other lecturers covered subjects of remote sensing such as evaluation of sea surface temperature, ocean color, and microwave active and passive remote sensing with radiometers, altimeters and scatterometers. Use of synthetic Aperture Radar, SAR, was featured in particular. On the first day Dr. Hiroshi Kawamura from Japan gave a welcoming talk on behalf of IOC. I participated as an observer from the PORSEC Association.

The eleven foreign students came from the following seven countries, Bangladesh, India, Indonesia, Malaysia, the Philippines, Thailand and Vietnam\*. They were all either graduate students or working young professionals, so they were well prepared to attend this high level instruction. However, over a three day period they did just get an idea of how some new technology might benefit their research at home. Many of them would value an extended training period with hands on experience in institutions that are already using these data and techniques. We are hoping that announcements through this Bulletin of opportunities for training and work experience, such as scientific exchanges or post-doctoral positions, may result in connections between young professionals and appropriate institutions.

*\* The foreign student participants were:*

Name	Country	Title	Education
Abu Hena M.K.	Bangladesh	Ass Prof	Ph D
Awang, D.	Malaysia	Res. Scientist	M.Sc
Cantos J. A.	Philippines	Proj. Manager	M Sc
Do, T.T.H.	Vietnam	Researcher	B Sc.
Hashibul I.	Bangladesh	Research Ass.	M.Sc
Kawser A.	Bangladesh	Ass. Prof.	Ph D.
Komwong K.	Thailand	Scientist	B Sc
Narumitr S.	Thailand	Research Ass.	M Sc
Singh S.	India	Proj. Assoc.	PhD
Trisakti B	Indonesia	Research Sci	PhD
Winasaro G.	Indonesia	Research Sci	PhD



*Attentive students at KARI*

Course lectures were designed for two groups which divided the participant into an Oceanography and a Synthetic Aperture Radar-SAR group. There were some common lectures both on Oceanography and SAR as well.

In the Oceanography topic, the determination of sea surface height, from space by altimeter sensors and wind speed and direction from scatterometer sensors were presented. The students also learned how to measure ocean color, especially chlorophyll a, and sea surface temperature from space.

Dr. Robert Schumann presented many applications of Remote Sensing for oceanography. Prof. Alpers introduced application of SAR data to detect a moving object, and SAR basic theory and data application in different practical fields such as flood monitoring, storm prediction and wind speed and direction.

On the 3rd day, the two groups were merged to study SAR data fusion, data planning and application. Dr. Bouvet introduced the Earth Observation Principal Investigator program and illustrated how to request data from ESA for research.

After the completion of lectures, prior to the awarding of certificates, participants were taken to a tour within the KARI premises to see the KOMPSAT (Korea Multi-Purpose Satellite) ground station and the ongoing development work of future KOMPSAT satellite.



*Ground Station of Korea Multipurpose Satellites*

*The editors thank several of the students in the KARI course for their contributions of pictures to this issue. Not all of the pictures could be used, unfortunately, but they are all appreciated.*

## Remote sensing technology and indigenous knowledge. A participatory spatial approach to conservation planning in Puerto Galera, Philippines

Jose Alfred Cantos, World Wildlife Fund

Planning for biodiversity conservation is usually faced with scarcity of data as a basis for management decisions. In an effort to address this gap, analytical tools and decision support systems are increasingly used. These tools integrate and process large volumes of data and help address complicated but key planning principles in a systematic way. Furthermore, they assist stakeholders to understand how data are utilized, and enable rapid evaluation of outputs against planning principles. Based on available biophysical information, decision makers are provided compelling suggestions for effective and sound decision making. This process is focused on complementing field-based observations with data generated through remote sensing applications. The challenge then is to prove that units identified on remote sensing data represent features identified in the field.



*White Beach at Puerto Galera*

In Puerto Galera, Philippines a number of these tools were applied to support the development of its coastal resource management plan. Comprehensive and quality information on the distribution, status, and utilization of Puerto Galera's biodiversity is the cornerstone for formulating its conservation plan. However, much information is not easily available and widely dispersed. Furthermore, the information is often not in readily usable electronic forms. Hence, to depict Puerto Galera's ecosystems and bring forth stakeholders participation in planning for conservation in the area, the World Wildlife Fund through its coastal resource management program facilitated a participatory coastal resource assessment to provide inputs for the development of its coastal resource management plan. This plan contains the stakeholders' vision for the municipality and the issues that they collectively identified as impediments to its realization. Moreover, it lays down the actions that they will undertake to achieve this vision.

The municipality of Puerto Galera lies along the north side of Mindoro Island of the Philippines. Its rich marine resources and the biodiversity contained in its exquisitely formed lagoons and unique coves beckoned the world to recognize its ecological importance when it was declared a UNESCO's Man and Biosphere Reserve through Presidential Decree 354 in 26 December, 1973. This world recognition summoned tourists in unprecedented number but gave rise to a spontaneous, unplanned, and poorly managed service sector which severely threatened the integrity of the reserve. The tourism boom sparked high immigration, massive land use alteration, intensification of fishing, proliferation of water sports activities, expansion of navigation routes, and reclamation of coastal waters and upsurge of waste production. The over-all deterioration of the environmental conditions in Puerto Galera had severely weakened its marine ecosystems when WWF undertook this project, thus threatening its biodiversity. The biodiversity that builds tourism is now in peril.

Careful planning necessitates participation of various sectors who use the resources. Community participation is one of the most important strategies in coastal resource management as it recognizes the communities' capacity to spearhead planning, implementation and monitoring of coastal development activities.

The process started with a resources assessment tool workshop where various sectoral representatives in the community were trained on resource mapping and diagramming. It involves gathering and analyzing environmental, ecological, social, and economic information about the management area. Such a process provides the stakeholders an overview and estimation of available biodiversity resources in their community. The tool workshop was then followed by actual habitat assessment which enabled the participants to verify the extent and condition of their resources and identify actual features for mapping such as habitat, resources, and uses.



*Habitat mapping with community members*

The data collected in the field using stratified random sampling were analyzed statistically to identify potential uses of existing resources. Using remote sensing technology, ASTER satellite imagery of the area was processed using unsupervised classification procedure. To enhance the accuracy of the classification, field validation of the classified imagery was performed by local communities and scientists. Participatory coastal resource assessment maps reflecting local knowledge of features which were generated by the local communities were used to complement and validate the results of the classification. The data generated from the field and the habitats mapped on remote sensing images showed agreement with the results of field based surveys. This determined the exact location and extent of features in the area. These data were then used in important ways during the planning process in the development of the Coastal Resources Management (CRM) Plan.

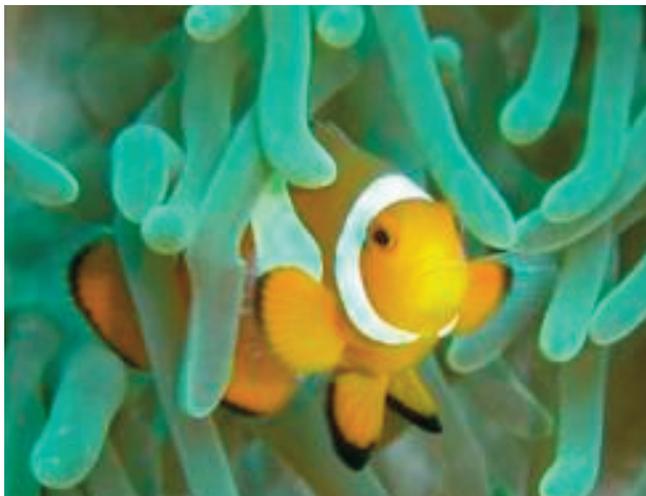


*Land use map*

These data were then used in important ways during the planning process in the development of the Coastal Resources Management (CRM) Plan.

Six workshops were conducted between April and June 2005. There were five sectoral workshops and one grand stakeholders' workshop. The stakeholders groups were clustered into five: indigenous people, diving shop operators, tourism service providers, fishers and local government officials and personnel. Each group held a separate workshop. The workshops had a total of 84 participants. In each workshop, the participants did a review and validation of the result of the baseline studies which included habitat maps, species composition, and biodiversity index. They also formulated a 25-year vision for Puerto Galera and described the issues hampering the realization of the vision. Furthermore, they characterized the on-going actions on the issues and came up with proposed actions for the next five years.

There were sixty-four (64) representatives of the stakeholders groups from the sectoral workshop who attended the grand stakeholders' workshop. They reviewed the results of the sectoral workshops and formulated a common vision for the entire municipality. The review enabled them to revise the actions put forward in the sectoral workshops and constituted these into a full-blown program. The implementers and sources of funds for each action were subsequently identified and the required time and funds to complete these were also allocated.



*Clown fish in sea anemone*

Spatial analytical capabilities of GIS allowed characterizing habitats, quantifying patch sizes, shapes and extrapolate results of ground based estimations such as species richness, biodiversity index, and biomass values. This process considers land cover as a mosaic of patches of ecosystems with unique species composition and zones for various uses. During the coastal resources management planning participated in by various stakeholders who were also engaged in the ground truthing activities, the final output served as a guide-tool for the participants in determining the location and extent of biodiversity features in the area. It was also significantly used as a basis for developing their management plan. Indicated in this tool were all significant existing resources of Puerto Galera including biodiversity, socio-economic issues, potential uses, and

extent of pollution. Now that the plan had been developed, the results of the classification procedure will serve as baseline data and as a basis for evaluating the effectiveness of the coastal resource management plan by comparing sets of multi-temporal classified images and applying change detection analysis.

The largely unmanaged tourism and fishing industries of Puerto Galera have already taken its toll on its coastal resources. This is seen in the condition of three ecosystems that were mapped out: coral reef, sea-grass meadows and mangrove area. The government, private sector, NGO:s (Non-governmental Organizations) and various stakeholders in Puerto Galera are generally unprepared to handle these problems, many of which require long-term solutions. Fortunately, they have taken the first step to respond to the problems by formulating the coastal resource management plan. The CRM Plan will be the main tool that will systematize the actions of various stakeholders in Puerto Galera in protecting its coastal environment and ensure a unified effort in conservation. Its implementation is the first step in an endeavor towards the achievement of their vision.

***“With this preparation we witness the paradigm shift from conventional spatial decision support systems to participatory spatial approach to conservation.”***

Information system technologies hosted on powerful computers have been adopted to prepare decision support systems in various application areas. The biodiversity conservation planning is not an exemption. Conservationists and decision makers have been involved in generating huge databases on species, their status, habitat, socio-economic impact, threats to their existence and many other variables. Analysis of these various pieces of information gives a scientific basis for decision making. With this preparation we witness the paradigm shift from conventional spatial decision support systems to participatory spatial approach to conservation.

*José Alfred Cantos is Project Manager for the World Wildlife Fund study in Puerto Galera in the Philippines e-mail: [jcantos \(at\) wwf.org.ph](mailto:jcantos@wwf.org.ph)*

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## Pan Ocean Remote Sensing Conference 2008 in China

*DanLing TANG (Lingzis). South China Sea Institute of Oceanology*

The South China Sea Institute of Oceanology (SCSIO), Chinese Academy of Sciences will be hosting the PORSEC 2008 in Guangzhou, China. The accompanying picture shows the handing over of “The Banner” on the last day of PORSEC 2006, a tradition since the beginning of the biennial conferences. Co-host will be the China Ocean University in Qingdao, China.

The Theme of this conference will be: Remote sensing of environmental changes in the Asian-Pacific region and beyond. The exact dates of the conference are to be announced, but proposed period is in Nov.-Dec, 2008.



*From left to right, Danling Tang, Leader of the Remote Sensing and Ecosystem Group at SCSIO, Kristina Katsaros, President of the PORSEC Association, Dr. Shi Ping, Director of SCSIO and Dr. W. D. Fang, Director of Research Planning at SCSIO.*

### About The South China Sea Institute of Oceanology (SCSIO)

Founded in January 1959, The South China Sea Institute of Oceanology (SCSIO) in Guangzhou, China, is one of the largest marine research institutes in China, and is part of the Chinese Academy of Science. It has 388 staff members, 47 research scientists, 43 Ph.D –advising Professors. SCSIO operates a postdoctoral research station and a Ph.D degree program in the fields of Marine Biology, Physical Oceanography, Marine Geology, Marine Chemistry, and Marine Environment.



For further information, visit:

1. Homepage in English: <http://www.scsio.ac.cn/scsio/default.htm>
2. Homepage in Chinese: <http://www.scsio.ac.cn/>
3. PORSEC's homepage [porsec.nwra.com/porsec2008/](http://porsec.nwra.com/porsec2008/)

The first Circular of PORSEC 2008 will be coming soon.

Related news, photos and web sites:

<http://www.cas.ac.cn/html/Dir/2006/11/06/14/54/20.htm>

<http://lingzis.51.net/workshops/GZ2008.htm>

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# Notices

## Jobs and Training Opportunities:

### Position Announcement

#### Tsunami Numerical Modeler

#### Alaska Earthquake Information Center

#### Geophysical Institute

University of Alaska Fairbanks

Application Review Ongoing

For further information, please go to:

<http://www.uakjobs.com/applicants/Central?quickFind=58173>

or contact: Shelly Wade

E-mail: [shelly.wade \(at\) gi.alaska.edu](mailto:shelly.wade@gi.alaska.edu)

### Postdoctoral Position Available

#### Meteorology/Atmospheric Science

Department of Meteorology

Stockholm University

Application Deadline: Monday, 26 March 2007

For further information, please go to:

<http://www.su.se/pub/jsp/polopoly.jsp?d=858&a=15944>

or contact: Michael Tjernstrom

Department of Meteorology, Stockholm University

E-mail: [michaelt \(at\) misu.su.se](mailto:michaelt@misu.su.se)

### Graduate Research Assistantship Available

#### Ecosystem Change In the Arctic

#### International Tundra Experiment

Toolik Lake Long Term Ecological Research Site, Alaska

Applications Accepted Until Position Filled

For further information, please contact:

William Gould

E-mail: [wgould \(at\) fs.fed.us](mailto:wgould@fs.fed.us)

### PhD Position Available

Causes and Consequences of the Extreme Climate Variability In the High North Atlantic Nansen Environmental and Remote Sensing Center Bergen, Norway

Application Deadline: Sunday, 1 April 2007.

For further information about the Nansen Environmental and Remote Sensing Center, please go to: <http://www.nersc.no>

or contact: Igor Esau ; E-mail: [igore \(at\) nersc.no](mailto:igore@nersc.no)

## PhD Position Available

### "Arctic Water Source Dynamics, Stream Habitat and Biodiversity In a Changing Climate: A Field-based Investigation In Swedish Lapp-land" Geography, Earth and Environmental Sciences (GEES)

University of Birmingham, Birmingham, UK,

Application Deadline: Friday, 16 March 2007

For further information, please see the full position description linked under "Fluvial and Ecological Processes" on the GEES website at:

<http://www.gees.bham.ac.uk/research/postgradresearch/physical>

## Meetings:

Leonid Mitnik with colleagues in Vladivostok is organizing a conference on the theme:

### Advances of Satellite Oceanography: Understanding and Monitoring of Asian Marginal Seas

3-6 October 2007, Vladivostok, Russia

(Sputnik: 50th Anniversary)

Contact person: D.Sc. Leonid Mitnik

Head, Satellite Oceanography Department

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690041 Vladivostok, Russia

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e-mail: [mitnik \(at\) poi.dvo.ru](mailto:mitnik@poi.dvo.ru) or

[lm\\_mitnik \(at\) mail.ru](mailto:lm_mitnik@mail.ru)

### 2007 EUMETSAT Meteorological Satellite Conference and the 15th AMS Satellite Meteorology and Oceanography Conference, 24-28 September 2007, Amsterdam, the Netherlands

Abstract Deadline: 31 January 2007 Manuscript

Deadline: 15 October 2007

Preregistration Deadline: 30 July 2007 Initial

Call Published: October 2006

<http://www.eumetsat.int/Home/Main/Media/Announcements>

### IGARSS 2007, July 23-27, Barcelona, Spain

<http://www.igarss07.org/frontal/Inicio.asp>

## News from our members

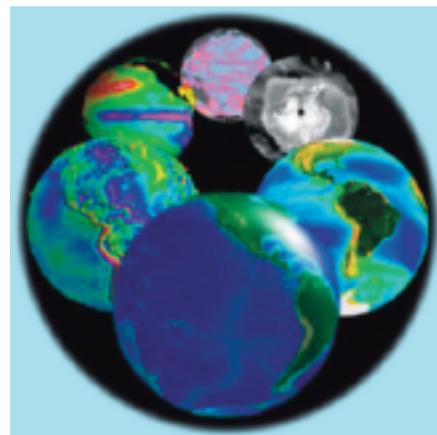
*Satrughan Singh*, a participant from India in the ESA and KARI sponsored remote sensing course in Daejeon and a recipient of PORSEC support, has recently begun graduate studies at Louisiana State University. Here are his coordinates: Room No. 415, Howe-Russell Geoscience Complex, Department of Oceanography & Coastal Sciences, Louisiana State University, Baton Rouge, LA 70803.U.S.A.  
E-Mail : [ssing12 \(at\) lsu.edu](mailto:ssing12@lsu.edu) or [shatrughan\\_singh \(at\) yahoo.com](mailto:shatrughan_singh@yahoo.com)  
Phone: (001)-(225)-218-5558 (Mob.)  
(001)-(225)-334-5063 (Resi.)

*Daud Awang* is currently working with *Dr. Tan Chun Knee* (from United Nation University). Every month he provides Daud with satellite imagery, consisting of SST and Chlorophyll data. Daud performs validation and ground "truthing". He will perform a survey in the South China Sea from Feb 27 to March 26, 2007, for Stock Assessment of demersal fisheries in the Sarawak waters.

## About the PORSEC logo

The logo that is in the banner to the PORSEC Bulletin was created by *Dr. Efrain Rodriguez*, Scientific Director of Operational Oceanography, Pollution Control Center of the Colombian Navy at Tumaco, Colombia and *Dr. José Stuardo Barria*, Professor Emeritus of the University of Concepcion, Chile. It was first used for the PORSEC 2004 in Chile.

The idea represented in the logo came out of the vision to integrate the biological, geophysical and physical variables as detected from space by satellites and their remote sensors.



### The spheres seen from top to bottom and from left to right represent:

- Upper left: AVHRR Sea Surface Temperature image of La Niña, 1999 (NOAA)
- Middle: Surface winds by QuikSCAT, 1999 (NASA)
- Upper right: South Pole viewed by the the NASA scatterometer, NSCAT, 1996-97(NASA)
- Lower left: Mean Gravity Anomalies, EGM96, from the Goddard Space Flight Center (NASA)
- Lower right: SeaWiFS Biosphere Globes (Chlorophyll-a), Boreal Winter (NASA)
- Low center, main globe: Global bathymetric model ---derived from ship soundings and satellite altimetry by W.H.F. Smith and D.T. Sandwell (1997)

Update for these global images could be introduced into the logo. Your contributions and suggestions would be welcome. Send to the editorial office of this Bulletin.

## Information

For information about the association and links to Newsletters from the president and archived Bulletin issues go to: <http://porsec.nwra.com/>. To join the PORSEC Association go to membership on the web site or contact one of us directly. The Bulletin of the PORSEC Association is edited by Gad Levy and Kristina B. Katsaros. Production Editor Susanne Öhrvik.

***We welcome contributions about your work and any activities of our PORSEC members that may be of interest to other members for future issues of the Bulletin.*** To submit articles for this Bulletin of the PORSEC Association, please contact: [gad \(at\) porsec.nwra.com](mailto:gad@porsec.nwra.com) or [katsaros \(at\) porsec.nwra.com](mailto:katsaros@porsec.nwra.com). For the July issue, submissions should reach the editors by June 25, 2007.