

Technical Commission VIII
Remote Sensing Applications and Policies

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Report of Outgoing President

The activities of commission VIII and its working groups focused mainly on the July 2008 Congress at Beijing. Eventually, over 400 abstracts and full papers were submitted to Commission VIII review. The review process was done by the WG officers with the support of the TCP. About a quarter of the submissions were accepted for oral presentation in nineteen Technical Sessions and 12 Poster Sessions for all working groups were many interesting and advanced research and applications experience and conclusions will be presented on topics related to the Human impact, Disaster mitigation and management; Handling of hazards locations; Public Health; Air pollution; Tropical Zones; Treaties; Coastal Zones; Water security; Global warming impact and "polar-cryogenic" research; Land degradation and desertification; Forest and landform management; Geology. These are complimented by three Theme Sessions and two Special Sessions on: "Integrated Coastal Zone Management", "Public health" and "3-Dimensional Modeling in Forestry Applications". Also, two Special Sessions were organized also by commission VIII one on Observation and Monitoring of Polar Regions and the second on "Geomatics and emergency response".

In addition to the main task at hand, some of the working groups continued with the planning of workshops and other scientific meetings. Among those, three were already confirmed by ISPRS council. WG VIII/1 has supported the 6th international Symposium on Agroenviron, April, 28 – may, 1, 2008, Ankara, Turkey; WG VIII/11 is organizing the 8th Seminar on Remote Sensing & GIS applied to Forestry, to be held in Curitiba, Paraná State, Brazil, 7-9 October, 2008; and WG/12 is organizing the 6th EARSeL SIG IS Workshop "Imaging Spectroscopy: Innovative tool for scientific & commercial environmental applications", 6-9, March 2009. Tel-Aviv, Israel.

Outlook by Incoming President

Applications of remote sensing are rapidly expanding. In the early age of remote sensing, most of the applications were related to operational applications, e.g. land use mapping, geological applications, etc. However, these application areas were expanded to ocean and air applications with the launches of new sensors. Also, after the global change problems became apparent, global observations and analyses of obtained data occupies a large area. The Commission VIII covers all the areas of remote sensing applications from global change research to operational applications. These applications will support decision making, forecasting and monitoring.

Another point of view which should be considered is the establishment of GEOSS (Global Earth Observation System of Systems). GEO (Group on Earth Observation) has issued the 10 year implementation plan of GEOSS, and 9 societal benefit areas were established. The Commission VIII for 2008-2012 has set up total of 10 working groups to promote and clarify the role of ISPRS, and also to respond to the societal benefit areas of GEOSS.

WG VIII/1 will deal with disasters. Areas covered will be detection, early warning, monitoring and assessment of all kinds of disasters.

WG VIII/2 will deal with health. Areas covered will be early warning and surveillance of environmental impacts on human health.

WG VIII/3 will deal with atmosphere, climate and weather. Areas covered by this WG are rather wide. Covered areas are monitoring of physical and chemical properties of atmosphere, process study of climate and weather, data inputs and assessment of its effects to numerical weather prediction models, improvement of accuracies of climate variables for the input of climate models, evaluation of climate models using long term data records, etc.

WG VIII/4 will deal with water. Areas covered are monitoring of water quality and quantity, rainfall runoff modeling, monitoring of precipitations, monitoring of soil moisture, improvement of the understanding of the energy and water cycle, etc.

WG VIII/5 deals with energy and solid earth. Areas covered are exploration, exploitation and environmental monitoring of non-renewable resources, geological and geomorphological mapping, monitoring and assessment of renewable energy resources, etc.

WG VIII /6 deals with agriculture, ecosystems and bio-diversity. Areas covered are crop monitoring, agriculture management, better understanding of carbon and nutrient cycles, study of the bio-diversity, monitoring of wet lands including mangroves, etc. This working group will focus mainly to grasslands, agricultural lands, and wet lands, and

forest will be dealt with by the WG VIII /7.

WG VIII/7 will deal with forest. Areas covered will be very similar to those of WG VIII/6, but mainly deal with forests.

WG VIII/8 will cover land. This WG covers land related applications not covered by WG VIII /5, VIII /6 and VIII /7. Areas covered are land cover mapping of from urban areas to global areas, explore, document and monitor natural and cultural heritages, monitoring of arid lands, etc.

WG VIII /9 deals with ocean. Areas covered are monitoring and process studies of ocean physics, ocean chemistry and ocean biology, better understanding of air-sea interactions, coastal studies, etc.

WG VIII /10 deals with cryosphere. This WG covers not only polar regions but also high mountains, especially glaciers and glacier lakes. Also the sea ice, snow covers and permafrost areas are included.

Working Groups of Technical Commission VIII for 2008-2012

WG VIII/1: Disaster

Chair: Piero Boccoardo (Italy)

Co-Chairs : T. Srinivasa Kumar (India)

Robert Backhaus (Germany)

Secretary : Fabio Giulio Tonolo (Italy)

WG VIII /1 Terms of Reference

- Generation of vulnerability and hazard zone maps for different type of disasters, such as forest fire, cyclone, floods, drought, volcano eruptions, earthquakes, land slides etc. and identification & assessment of potential risk zones.
- Integrate remotely sensed observations and communication strategies with enhanced predictive modeling capabilities for disaster detection, early warning, monitoring, and damage assessment.
- Development of disaster management plans for pre, during and post disaster situations and enhance support for early warning systems, emergency events mitigation and decision making.

WG VIII/2: Health

Chair: Amelia M. Budge (USA)

Co-Chair : Richard Kiang (USA)

Secretary: Stanley A. Morain (USA)

WG VIII /2 Terms of Reference

- Integrate Earth observations products with enhanced predictive modeling capabilities for early warning and surveillance of environmental impacts on human health in co-operation with other international, national, and regional organizations and activities.
- Participate in the ICSU initiatives including the GeoUnions Health Group and the Science for Health and Well-being (SHWB).
- Take a leadership role in appropriate GEO health tasks in accordance with the 10-year implementation plan.
- Contribute to the ISPRS book series focusing on environmental effects on human health
 - Develop a registry for human health projects and products that use Earth observations and kindred technologies
- Bridge the Earth observing communities of practice and human health communities of practice by including health professionals in ISPRS sanctioned technical sessions, workshops, and symposia

WG VIII/3: Atmosphere, Climate and Weather

Chair: Tatsuya Yokota (Japan)

Co-Chair: Jhoon Kim (Korea)

WG VIII /3 Terms of Reference

- Enhance retrieving and monitoring status and effects of clouds and aerosols.
- Enhance retrieving and monitoring status and effects of atmospheric greenhouse gases, like carbon dioxide, methane, etc.
- Enhance retrieving and monitoring capabilities of atmospheric minor constituents and aerosols both in stratosphere and troposphere.
- Enhance the monitoring capabilities of atmospheric winds.
- Increase the accuracy of atmospheric radiative forcing to contribute to the climate models.
- Increase the knowledge of atmospheric processes to improve the climate models.
- Improve the quality of remote sensing data input to numerical weather forecast system to increase the accuracy of weather forecasting and nowcasting.

WG VIII/4: Water

Chair: Taikan Oki (Japan)

Co-Chair: Wesley Berg (USA)

Regional Coordinator : Christian D. Kummerow (USA)

WG VIII /4 Terms of Reference

- Implement remotely sensed data to monitor and investigate discharge of pollutants into water transportation and storage system for investigating sedimentation and contamination of water resources.
- Adopt remotely sensed data for monitoring quality and quantity of water resources.
- Integrate remote sensing and GIS for rainfall runoff modeling. (with Com.4)
- Enhance the capability of monitoring global rainfall as well as snowfall.
- Improve the retrieval of soil moisture and latent heat for better understanding of water and energy cycle.

WG VIII/5:Energy and Solid Earth

Chair: Thomas Cudahy (Australia)

Co-Chair : Yoshiki Ninomiya (Japan)

Secretary : Ian Lau (Australia)

WG VIII /5 Terms of Reference

- Adopt remote sensing data to non-renewable resource exploration, exploitation and related environmental monitoring, especially energy (hydrocarbons, geothermal and uranium) and minerals (precious, base metals and commercial minerals).
- Further the implementation and integration of higher level remote sensing products tailored for geological and geomorphological mapping, especially publicly available, continental-scale mapping opportunities.
- Help facilitate the development of geological and geomorphological product standards and related error assessment derived from remote sensing data
- Foster technology transfer through the sharing of convincing geological and geomorphological case histories derived from remote sensing data
- Help develop mechanisms that facilitate the uptake of geologic and geomorphologic remote sensing information products into Earth science applications, especially understanding the 3D and 4D (temporal) nature of the solid Earth, such as tectonic activity, hydrocarbon and minerals systems, water catchment modeling and monitoring, soil processes (erosion, acidity, salinity and carbon), and dune systems.

(with Com.4/2 & 5/6)

WG VIII /6: Agriculture, Ecosystems and Bio-diversity

Chair: Shibendu S. Ray (India)

Co-Chairs : Yoshiaki Honda (JAPAN)

Ross S. Lunetta (USA)

Secretary : NR Patel (India)

WG VIII /6 Terms of Reference

- Define protocols and methodologies to efficiently and economically utilize remote sensing inputs to monitor crop production, crop vigor, and stresses for making agricultural decisions.
- Development of techniques towards use of remote sensing data and GIS tools for site-specific management of agriculture.
- Development of techniques towards use of remote sensing data and GIS tools for monitoring and analyzing human impacts to natural resources.
- Improve the knowledge of carbon and nutrient cycle in vegetation.
- Enhance the use of active sensors to evaluate and monitor biological and physical processes, which are important in agriculture ecosystems.
- Improve the retrieval of crop land and grassland information from remote sensing data through advances in procedures and models for inventorying and monitoring of vegetation resources and biomass.
- Study and promote vegetation bio-diversity and sustainable application with respect to the convention of bio-diversity.
- Improve regional/global monitoring of mangroves using remote sensing data.
- Assess climate change impact on vegetation using Earth observation data and forecasting models.
- Integrate remote sensing data, in-situ and other measurements into a GIS domain to monitor and facilitate study and research of wet lands, and monitor spatial and temporal changes in the wet land and processes of wet land degradation.
- Implement remote sensing and geospatial methodologies in support of sustainable development in wet lands and wet land resources assessment.

WG VIII /7: Forest

Chair (Forest) : Haruo Sawada (JAPAN)

Co-Chair : Barbara Koch (Germany)

WG VIII /7 Terms of reference

- Enhance the use of active sensors to evaluate and monitor biological and physical processes, which are important in forest ecosystems. (with Com.1/2)
- Improve the retrieval of forest information from remote sensing data through advances in procedures and models for inventorying and monitoring of forest resources, stocks and biomass.
- Apply remote sensing techniques and GIS tools to support forest management tasks. (with Com. 4/2, 4)
- Improve the knowledge of carbon cycle including NPP and NEP estimates using land remote sensing data.

WG VIII /8: Land

Chair: Alfredo R. Huete (USA)

Co-Chairs : Carsten Jürgens (Germany)

Ryutarou Tateishi (Japan)

Secretary : Dennis G. Dye (USA)

WG VIII /8 Terms of Reference

- Improve the accuracy of land cover mapping and generate global and regional land cover maps.
- Improve the accuracy of land cover change detection and generate global and regional land cover change maps.
- Apply improved interpretation and mapping methods for urban, sub-urban and peri-urban land cover in transition to help for better urban planning using remote sensing data.
- Monitor urban environment and land cover change for the study of urbanization structure and development processes.
- Use remote sensing and GIS for infrastructure development of urban settlements.
- Explore, document and monitor natural and cultural heritages. (with Com.5)
- Integrate remote sensing data, in-situ measurements and other geospatial data to facilitate research, applications, and monitoring of arid lands, rangelands and soils.
- Improve the monitoring of spatial and temporal environmental changes in arid environments and processes of land degradation, desertification, salinization, wind and water erosion, ecohydrology, and biogeochemical cycling.
- Implement remote sensing and geospatial methodologies in support of sustainable

development in arid lands, land resources assessment and management of arid and dry lands.

WG VIII /9: Ocean

Chair: W. Timothy Liu (USA)

Co-Chairs: Joji Ishizaka (Japan)

Samantha Lavender (UK)

WG VIII /9 Terms of Reference

- Measure, characterize, understand, and predict, the storage and transport of momentum, heat, water (salinity), and greenhouse gases in the ocean and the surface signatures (temperature, salinity, dynamic topography) of ocean response and the surface forcing (wind stress, fresh water, turbulent and radiative heat flux) from diurnal to decadal time scales, and from coastal to open oceans.
- Understand ocean's role in the changes and interaction among the biological, chemical, and energy/water cycles in the oceans and their influence on terrestrial and cryospheric changes.
- Coordinate present and future space missions related to ocean observation, and the calibration, validation, and dissemination of their data.

WG VIII /10: Cryosphere

Chair: Josefino C. Comiso (USA)

Co-Chair: Beata Csatho (USA)

WG VIII /10 Terms of Reference

- Improve the retrieval of geophysical parameters relevant to the different elements of the cryosphere.
- Develop strategies and algorithms for assimilating remotely sensed data in models of polar processes.
- Develop long term records and study on-going changes in polar regions.
- Study the changes of ice sheets in Antarctica and Greenland.
- Study the trends and changes of glaciers and glacier lakes.
- Study the trends and changes of sea ice.
- Study the trends and changes of snow cover and snow albedo.
- Monitor the thaw process and changes of permafrost.