The Global Mangrove Watch
MAPPING MANGROVE RESPONSE TO NATURAL AND ANTHROPOGENIC CHANGES

BlueCARES | IFOV:
DR. DAN FRIESS

REMOTE SENSING AND GEOSPATIAL ARTIFICIAL INTELLIGENCE
FOR MONITORING BLUE CARBON ECOSYSTEMS IN VIETNAM

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Charmaine CRUZ
EDITOR-IN-CHIEF

Welcome to the 2nd issue of Spectrum (Volume 13), the official newsletter of the ISPRS Student Consortium! It is indeed an honor to be the new Newsletter Editor-in-Chief of the ISPRS Student Consortium and to continue the outstanding works of the former Editor-in-Chief, Angelica. Starting with this issue, we will feature themes that connect to the United Nations' Sustainable Development Goals (SDGs). We will highlight the importance of geospatial data in achieving a more sustainable future for all.

I am very pleased to present to you, in my first contribution to the Newsletter, articles featuring "blue carbon" and how various geospatial technologies are being utilized to preserve and protect our environment. Blue Carbon (BC) is defined as the biological carbon captured by coastal marine ecosystems such as mangroves, seagrasses, and salt marshes. In this Newsletter, let me introduce to you some interesting research projects working on these BC ecosystems, particularly on mangroves. In addition, the ISPRS SC team brings you a *Backsight* of the International Symposium on Remote Sensing 2019 held in Taiwan and a student activity during the biennial event of the ISPRS, the Geospatial Week held in the University of Twente, Netherlands. In the last section of the Newsletter, be sure to *Foresight* the upcoming events and ACRS 2019 student activities, as well as some exciting opportunities for you!

I would like to take this opportunity to thank Sheryl, the ISPRS SC Chair, for her full support and patience during my first Newsletter works. Also, to the rest of the team, Charles, Mustafa, Sona, and Kingsly, who have made my first few months as the Editor-in-Chief so rewarding. A special mention also to the volunteers, Andre, Sandra, Vince, and Ami, in sharing their talents and time for the completion of this issue. And of course, our great appreciation to all the contributors who had responded to our invitation in submitting articles for this issue. Thank you very much!

To all of you, I hope that you will enjoy reading this issue.

Charmaine A. Cruz
Editor-In-Chief
ISPRS Student Consortium

FROM THE BOARD

ISRS2019 International Symposium on Remote Sensing
TAIPEI, TAIWAN

By Min-Lung Cheng
PhD Candidate, Dept. of Architecture and Building Engineering
Tokyo Institute of Technology, Japan

The **International Symposium on Remote Sensing** (ISRS) is an annual conference organized by the **Korea Society of Remote Sensing** (KSRS), the **Chinese Society of Photogrammetry of Remote Sensing** (CSPRS), and the **Remote Sensing Society of Japan** (RSSJ). This event provides a platform wherein students, scholars, and experts whose studies are related to remote sensing may share their research, applications, and findings. It also provides a great opportunity for the participants to communicate with each other and strengthen their social networks. The ISRS2019 also has a conjunction with a special issue titled "Selected Papers from the 2019 International Symposium on Remote Sensing" in the MDPI Remote Sensing journal. We are highly encouraging those who participate in the ISRS2019 to publish their excellent studies for greater visibility in the world.

The ISRS2019 was held in **Taipei City, Taiwan** from **17-19 April**. Nearly 400 participants attended this conference to present their research and exchange ideas on remote sensing. Diverse topics such as photogrammetry, image processing algorithm, and SAR detection and application were presented and discussed during this event. With the growing popularity of Artificial Intelligence (AI) in recent years, special sessions about AI were also held for new feasibilities of data processing. Young Scholar's Night was a great occasion for students to meet their colleagues from different countries. At the end of this event, student paper awards were also given to those who showed their extraordinary studies. Let's congratulate these students for their contributions. Unfortunately, an earthquake with magnitude 6.1 occurred on the second day of this event. We hope that no one was injured or suffered any property damage in Taiwan.

For the upcoming activities, the 40th Asian Conference on Remote Sensing (ACRS2019) will be held in Deajuong City, Korea from 14-18, October 2019. Also, the ISRS2020 will take place in Busan, Korea from 22-24, April 2020. We sincerely invite everyone to join the above two events not only to improve their academic performance, but also to get to know more people and expand their social networks. Through discussing and communicating with each other, we are confident that these are great opportunities for all of you to enjoy your study life. Stay tuned to our social media for more information, and we are looking forward to seeing you next time.

ISPRS GEOSPATIAL WEEK 2019

By Sheryl Rose Reyes[1] & Charmaine Cruz[2]
[1]United Nations University, Tokyo
[2]University of the Philippines, Diliman

The **International Society for Photogrammetry and Remote Sensing Geospatial Week** (ISPRS GSW) is a biennial internationally scientific event that aims to bring together experts, professionals, researchers, and students working in the fields of remote sensing, photogrammetry, and GIS. It also serves as a venue for sharing the latest developments both in science and industry. This year, the fourth ISPRS GSW held from **10 – 14 June 2019** was organized by the **University of Twente in Enschede, the Netherlands**. Two ISPRS Student Consortium (ISPRS SC) board members participated in the event – Sheryl Rose Reyes, Chair and Charmaine Cruz, Newsletter Editor-in-Chief.

One of the main goals of the ISPRS SC is to link the students, young researchers and professionals from different countries who are interested in photogrammetry, remote sensing, and spatial information sciences by organizing different activities. In the evening of 13 June, the ISPRS Students and Young Professionals Night was organized by the ISPRS SC to gather students and young professionals attending the Geospatial Week 2019 for an informal meet-up. This was held in the Ideate Room, DesignLab at the University of Twente. This gathering aimed to promote the ISPRS SC and its activities, as well as to provide a platform of exchange among students and young professionals. Over 30 participants from Brazil, Germany, China, Taiwan, Canada, Vietnam, The Netherlands, South Korea, and India joined the event. A presentation about the ISPRS SC was given by Ms. Cruz, and a student provided a short tour around the different facilities and workshops in the DesignLab. Afterwards, the participants had the opportunity to socialize with one another and meet new friends who soon became parts of their professional networks. Overall, it was a fun evening for all the students and young professionals who attended the event!

Ms. Cruz presenting about the ISPRS SC and its activities.

A tour of the DesignLab at the University of Twente during the ISPRS SC Students and Young Professionals Night

The participants of the ISPRS SC Students and Young Professionals Night after the event

THE BLUE CARBON PROJECT

By Gay Amabelle Go

Study team doing measurements of different seagrass parameters.

Japanese and Filipino scientists studying the characteristics of the mangroves that survived Super Typhoon Haiyan in Eastern Samar, Philippines.

"Blue" carbon is the carbon captured by the ocean and coastal ecosystems such as seagrass beds and mangroves. These ecosystems not only provide us with a myriad of essential ecosystem services that provide coastal protection from storms, habitats for various flora and fauna, and nursery grounds for fish thus securing the livelihoods of fishing communities, but they also provide another integral service – "…an essential piece of the solution to global climate change". These ecosystems are highly efficient and effective in sequestering and storing "blue" carbon in their leaves, roots, and in the sediments. In fact, they are responsible in absorbing more than half of the carbon absorbed in ocean sediments.

Through expansion of coastal human settlements, pollution, and exploitation of coastal and marine environment, we continue to put these blue carbon ecosystems at risk. While sustainability should be the main goal and concern of policymakers in-charge, increasing efforts for creating better environmental conservation strategies and methodologies is a challenge for the scientific community. Remote observation and measurements of coastal and marine environments will pave a better way to coastal resource management. Remote sensing helps in the characterization of the marine environment and its features. It can provide a comprehensive spatial information of marine habitats, marine spatial extent, and coastal resource profile. Cost effective management and better conservation approaches can be achieved through the different tools provided by updated technologies on geospatial sciences.

BlueCARES, or the Comprehensive Assessment and Conservation of Blue Carbon Ecosystems and their Services in the Coral Triangle Project, is a trilateral research project funded by Japan International Cooperation Agency – Japan Science and Technology Agency (JICA-JST) under the SATREPS Program. Focusing on blue carbon, the project aims to establish and propose a 'blue carbon strategy' as an effective scheme in enhancing local efforts to conserve the ecosystems and improve their resilience, and thereby contribute in the mitigation of global climate change. Blue carbon ecosystem conservation actions through *Blue Carbon Strategy* are implemented in the Philippines and Indonesia, both of which are located in the Coral Triangle - the center of marine biodiversity in the world. For this purpose, comprehensive surveys are conducted for quantitatively assessing spatial distribution of blue carbon stocks and various fluxes governing the blue carbon dynamics in coastal ecosystem of both countries. Results of these surveys are utilized in developing an integrated model system on material cycle, carbon dynamics, and ecosystem responses under various environmental stresses.

BlueCARES highlights the important functions of carbon sequestering coastal ecosystems in the coral triangle. The project advocates support on management and conservation efforts towards these blue carbon regions of interest further strengthening the capacity of the local community and stakeholders, which will translate through final findings and outputs. Many people see only the economic value of these ecosystems but, beyond this, lies its positive effect on climate change in a longer time scale.

There is still a gap in the supply of important information between decision-makers and scientists. Exploitation of marine environments is still observable in the country. Long-term solutions towards local and global environmental issues are still inadequate and lacking. This highlights the need for the academe to initiate and provide more support to different governing bodies. The people behind the BlueCARES project believe in a multi-disciplinary approach with inter-agency cooperation in designing conservation policies involving various stakeholders to ensure effectivity. Further, the dissemination of recent initiatives and breakthroughs to the governing bodies and policymakers can be achieved by strengthening scientific communication that will translate findings to comprehensible information for key individuals.

ABOUT THE AUTHOR

Gay Amabelle is a marine scientist who has worked on various coastal and resource management projects in the Philippines. For most of her career, she has been working with the academic sector specifically, Xavier University and the University of the Philippines. She acquired her Masters degree at the Marine Science Institute, University of the Philippines. She has a strong background in seagrass ecology and coastal community interactions. While, she has relevant technical skills in coastal remote sensing as well as baseline ecological studies on marine habitats and marine fauna surveys. She has worked in international, multi-cultural setting when she was involved in a joint project between the Philippines and Japan, during her post-graduate training at the Nippon Foundation - POGO - Centre of Excellence program on observational oceanography in Germany, and during the South-North Atlantic Training onboard RV Polarstern in the Atlantic Ocean understanding the impacts of climate change. These have further led her understanding of global environmental issues and knowledge gaps, crucial in developing management framework for a sustainable environment.

PRINCIPAL INVESTIGATORS:

Prof. Kazuo Nadaoka
School of Environment and Society, Tokyo Institute of Technology, Japan

Dr. Ariel Blanco
Department of Geodetic Engineering, University of the Philippines Diliman, Philippines

Director Riyanto Basuki
Marine Research Center, Ministry of Marine Affairs and Fisheries, Indonesia

The Global Mangrove Watch

MAPPING MANGROVE RESPONSE TO NATURAL AND ANTHROPOGENIC CHANGES

by Dr. Nathan Thomas

Mangrove forests are saline tolerant forests found on every coastline in the tropics. Mangrove forests cover less than 1% of total forest area but provide a range of ecosystem services that include shoreline protection from hurricanes and storm surges, a habitat for a wide range of biodiversity, the maintenance of water quality, and the support of fisheries. In addition, mangrove forests are very carbon rich ecosystems and sequester and store higher amounts of carbon (blue carbon) than terrestrial forests. Despite this, mangrove forests have suffered enormous decline over the last century with total mangrove forest loss estimated to be as high as 50%. The primary drivers of this have been the conversion of mangrove forests to aquaculture (shrimp farming) and urban environments.

The Global Mangrove Watch (GMW) is an international collaboration led by the Japan Aerospace Exploration Agency (JAXA), Aberystwyth University, and solo Earth Observation in collaboration with Wetlands International, DOB Ecology, and the International Water Management Institute. It was founded in response to the observed decline in mangrove forests, recognizing the key role of satellite Earth observation data in providing accurate and reliable maps of current mangrove extent and historic and future changes – something needed in order to understand the pressure that mangroves were under. The fate of the blue carbon in these ecosystems is related to the mangroves themselves. Mangroves are able to accrete thick soils that lock in carbon but mangrove forest loss can lead to this being released into the atmosphere. At Aberystwyth University in the UK, we developed a method to systematically map mangrove extent and changes using a combination of optical and radar spaceborne imagery and in 2018 the GMW released a new global mangrove baseline for the year 2010. We published this method in Remote Sensing in 2018 (https://www.mdpi.com/2072-4292/10/10/1669) and the maps are hosted on the Global Forest Watch (GFW) web-
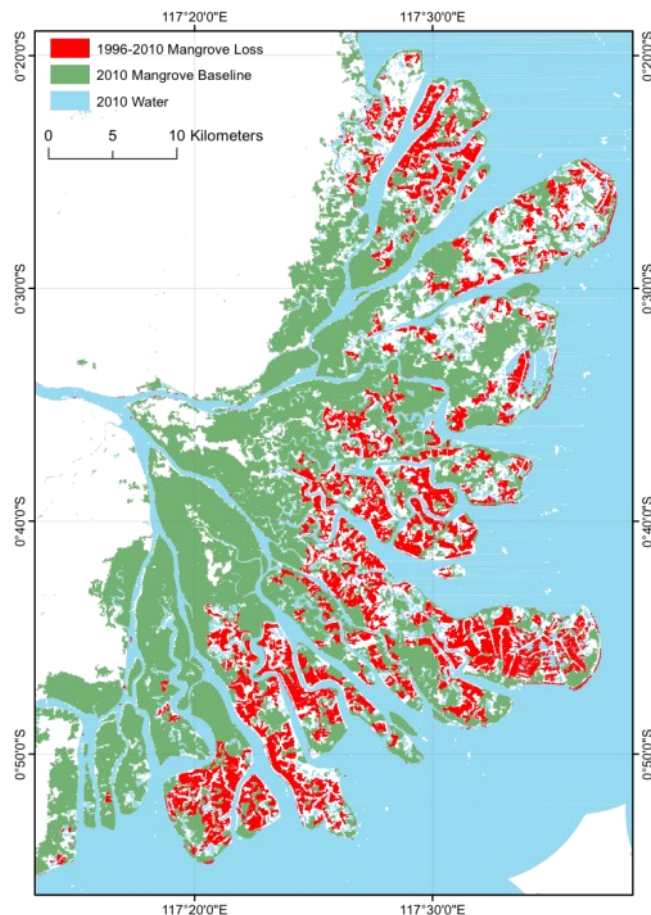

Figure 2. Mangrove Loss between 1996 and 2010 in the Mahakam Delta, East Kalimantan. The red color shows the conversion of mangrove to aquaculture.
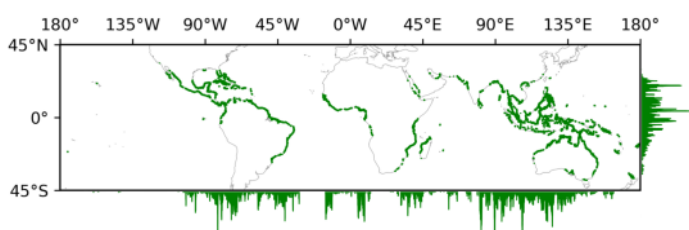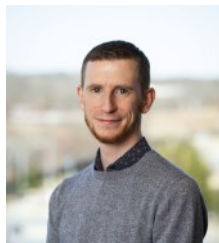

Figure 1. GMW mangrove baseline for 2010 and distribution of mangroves in longitude and latitude (WGS-84; epsg:4326).

site as their primary mangrove dataset and are available at the UN WCMC website (http://data.unep-wcmc.org/datasets/45). Following this, we produced and released seven change maps ranging from 1996 to 2016. These map changes in mangrove forest at 25 m resolution globally, revealing the distribution and magnitude of change in extent. These products are also available on the UN WCMC website.

The GMW supports the Ramsar Convention Wetlands Inventory and the UN Sustainable Development Goals (SDG), in particular SDG 6.6.1, where countries are required to report on the change in the extent of water-related ecosystems (including mangroves) over time. The GMW products also support a range of NGOs and members of the scientific community for both application purposes and research including the European Space Agency (ESA) Biomass CCI project which uses the GMW maps as their primary global mangrove dataset. The aim of the GMW is to provide data products that can be used at both the local and global level to counter the threats that are leveraged against mangroves and to aid the conservation and restoration of these important ecosystems and the blue carbon that they store.

The Global Mangrove Watch is an international collaboration organized by members:
- Dr. Ake Rosenqvist, SoloEO, Japan
- Prof. Richard Lucas, Aberystwyth University, UK
- Dr. Pete Bunting, Aberystwyth University, UK
- Lammert Hilarides, Wetlands International, Netherlands
- Dr. Lisa Rebelo, International Water Management Institute, Laos
- Dr. Nathan Thomas, ESSIC/NASA GSFC, USA

About the Author

Dr. Nathan Thomas
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I graduated with a PhD in Remote Sensing in 2016 from Aberystwyth University, UK, where I developed a method for systematically mapping mangrove extent and change at the global level. I subsequently spent 2 years as a postdoc at the CalTech Jet Propulsion Laboratory working on the mapping of marsh extent and biomass in Louisiana before moving to the NASA Goddard Space Flight Center. Here, I was involved in the publication of a global mangrove height and biomass map and continue to work on mapping mangrove extent and structure. My interests are in the use of remote sensing for mapping land cover types in the coastal zone and quantifying their structure (biomass) for improving estimates of blue carbon storage and change.

Remote Sensing and Geospatial Artificial Intelligence for Monitoring Blue Carbon Ecosystems in Vietnam

Tien Dat Pham (Ph.D.)

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Publication: Research Gate | Google Scholar

I had worked on forest monitoring using remotely sensed data at Vietnam National University of Agriculture (VNUA) since 2007. From October 2007 to June 2009, I worked on setting up a Mangrove Management Information System (MMIS) at the Department for Dyke Management and Flood control (DDM) under the Vietnamese Ministry of Agriculture and Rural Development (MARD). Central to the MMIS were satellite-based maps that provide DDM with accurate predictions of the extent and change of mangroves along the coast of Northern Vietnam. Throughout this project, I realized the socio-economic and ecological importance of mangrove ecosystems for climate change mitigation. However, the mangrove ecosystem has declined dramatically due to shrimp and aquaculture expansion as well as urbanization. Thus, I would like to deeply work on how to effectively monitor the mangrove ecosystem using remote sensing-based approaches in my future studies. Then, I had great opportunities to purse my MSc. and Ph.D. degrees in Japan under the Japanese for Human Resource Development Scholarship (JDS) funded by JICA and the Japanese Government scholarship (Monbukagakusho).

My previous work aimed at determining the relationship between the biophysical parameters of specific mangrove species and remote sensing data, investigating the applicability of machine learning techniques and remotely sensed data for estimating the aboveground biomass (AGB) of mangrove species at a coastal area in North Vietnam, testing the usability of machine learning techniques with an integration of optical and SAR data for the AGB estimation of mangrove forests in a coastal city of Vietnam, and promoting the implementation of the United Nation's Reducing Emission from Deforestation and Forest Degradation (REDD+) program and blue carbon projects based on the willingness to pay (WTP) for Mangrove Ecosystem Services (See https://doi.org/10.1016/j.ocecoaman.2018.07.005). This work also considers to propose better policy recommendations for coastal management and conservation in dealing with climate change impacts. My previous study is expected to promote the implementation of Payment for Ecosystem Services (PES) strategies as part of REDD+ program in developing countries, and thus provides support for developing regional and national "*Blue Carbon*" trading markets, and guiding mangrove management and conservation. My work may also promote an increased awareness among local people on the role of mangrove restoration in the context of climate change issues since mangrove forests are expected to contribute significantly to the reduction of climate change impacts. Through my work, local settlements can realize the requirements of a restoration plan for coexistence with natural resources, and avoid their degradation from long-term use.

My current work aims to propose a novel method by an integration of state-of-the-art (SOTA) geospatial artificial intelligence (AI), machine learning (ML) techniques and remote sensing data to estimate the C stocks of blue carbon (BC) ecosystems in Vietnam and to provide a baseline for Monitoring, Reporting, and Verification (MRV) systems useful to for national C trading markets of BC ecosystems. The expected results will assist policy makers to formulate better conservation policies for BC ecosystems in Vietnam.

Remote sensing-based approaches have been proven effective for mapping and monitoring BC ecosystems by a large number of studies. We did a comprehensive review of the applications of remote sensing techniques for mapping and monitoring BC ecosystems. The main goal of this review is to provide an overview and summary of the key studies undertaken from 2010 onwards on remote sensing applications for mapping and monitoring BC ecosystems. More information can be found at https://doi.org/10.3390/s19081933

Machine learning-based approaches can be employed for classifying mangrove species, identifying structure, and estimating biomass in BC ecosystem using various remote sensing data. Geospatial artificial intelligence and ML are particularly promising for discriminating mangrove species, quantifying biophysical parameters and structure, and estimating forest AGB biomass. More details on this can be found at https://doi.org/10.3390/rs11030230

I strongly believe that developing a geospatial database that uses the SOTA machine learning techniques and Earth observation (EO) remote sensing (RS) data combined

Photo taken by T.D. Pham during the survey in mangrove ecosystem in North Vietnam in November, 2018

with field measurements can greatly contribute to achieving a sustainable environment. Importantly, the development of computer vision, pattern recognition, machine learning, and deep learning algorithms is expected to provide more effective tools in mapping and monitoring BC ecosystems with promising results in the future. Moreover, developing an automatic monitoring of BC ecosystems using the Python library or other open source software can be adapted to amend the detection under various conditions of marine and tidal environments and can be employed to big EO data sources for large-scale and comprehensive conservation around the world, thus providing practical solutions for guiding sustainable BC conservation.

Finally, for those students and young professionals who are also interested in the study of the coastal environment using remote sensing technologies, I strongly recommend they should learn some programming skills using available libraries such as Python or R; and try to develop intelligent systems that could monitor BC ecosystems and assess their changes from large-scale time-series geospatial data using the high performing computer (HPC) system such as Google Earth Engine or to use freely access EO data acquired from the Sentinel or the Landsat sensors for monitoring BC ecosystem to support the MRV system under the REDD+.

ABOUT THE AUTHOR

Dr. Tien Dat Pham has been worked in remote sensing and GIS applications for natural resources management and forest monitoring as a researcher at Vietnam National University of Agriculture since 2007. He is currently a postdoctoral researcher at Geoinformatics Unit, RIKEN AIP, Japan since May 2018. He received his Ph.D. degree in Policy and Planning Sciences, Graduate School of Systems and Information Engineering in March, 2018 and MSc. degree in Environmental Sciences, Graduate School of Life and Environmental Sciences in July, 2012 at the University of Tsukuba, Japan. His research interests include optical and SAR remote sensing applications, land-use/land-cover change analysis and spatial modelling, multi-criteria analysis, forest biomass and carbon stocks estimation using multisensory, especially for Blue carbon Ecosystems.

He has served as a Guest Editor for a Special Issue in Remote Sensing entitled "*Advance Geospatial Artificial Intelligence for Forest Modeling, Prediction, Conservation and Management*" by Remote Sensing". He kindly invited the scientific community to contribute novel and original research to this Special Issue. Detailed information can be found at https://www.mdpi.com/journal/remotesensing/special_issues/AI_forest.

He is also a PI of a project entitled "*Monitoring mangrove carbon stocks using SAR data and machine learning techniques in Vietnam*" under for the 2nd Research Announcement on the Earth Observations (EO-RA2) coordinated by JAXA (Japan Aerospace Exploration Agency).

IMPORTANT | FOCUSED | OUTSTANDING | VALUABLE

DAN FRIESS

Associate Professor
Department of Geography
National University of Singapore

Research Interests and Expertise:
Mangrove forests, the ecosystem services they provide and their conservation

Dan Friess is a coastal geographer who leads the Mangrove Lab at the National University of Singapore, a multi-disciplinary group of researchers and students who investigate all aspects of the mangrove ecosystem. For more information visit www.themangrovelab.com

Can you tell us how you started working on the mangrove ecosystem? What was your motivation and what did you find the most interesting in this research field? What are the knowledge gaps and major challenges in the study of this ecosystem?

I have been working in wetland geography and conservation for approximately 15 years, and tropical mangroves for over 10. I always knew I wanted to work along the coast, and I was most interested in mangroves because of how crucial they are to the coastal communities who rely on the benefits, or ecosystem services they provide.

The major challenge in our research field is data. We work in some of the most data-scarce regions on the planet, so we are reliant on remote sensing or methods that allow rapid assessment in the field. But the challenge is not just the absence of data; there are many places that have fantastic data resources but for various reasons the data cannot be made available to researchers and other stakeholders. This is something we need to overcome, especially because many of these data are publicly funded and, if accessible, could contribute to solving a lot of problems on the ground.

Among the research projects that you have conducted, can you share with us a specific project that you liked the most? (Please briefly share with us the project's overall goal, its significance, the remote sensing concepts applied in the research, the outcome, and the reason why you enjoyed working in this project. You can also provide us with links to your papers)

My research group has conducted numerous remote sensing studies, but one that stands out for me was the completion of a national mangrove carbon stock for the whole of Singapore. Mangroves store disproportionately more carbon per hectare than other forests, so this makes them great for climate change mitigation. Countries who have signed up to the UNFCCC's Paris Agreement must report their greenhouse gas emissions, but also their sources and sinks of carbon. We mapped mangrove biomass carbon and combined it with field surveys of trees and soils to come up with the first national estimate for Singapore. Mangroves nationally store over 450 000 tonnes of carbon, despite covering only a small area. I enjoyed working on this study because from the start it was aimed to be policy-relevant, and the numbers are now being used by key stakeholders. We even had the Deputy Prime Minister of Singapore write a Facebook post about it! We want mangroves to be included in policy discussions, but to do that we need to provide decision makers with the data upon which they can make their decisions.

What is your environmental advocacy? What do you think is the best but the most practical way to protect our environment? How do you think remote sensing and geospatial science contribute to achieving a sustainable environment?

My view of environmental advocacy is one of realism. We have to try to appreciate all sides of the argument and then shape the narrative towards a good conservation outcome. This often requires evidence, and geospatial technology can help provide this.

This process is slower, and sometimes it doesn't end up with the solution we want. But when it does work it is more likely to be sustainable over the long-term, because we have buy-in from all stakeholders.

What do you think is the future of remote sensing technologies and geospatial science in the field of the coastal environment? What could be the greatest contribution of the youth in environmental conservation and protection?

The future of coastal geospatial science is in 3D! Mapping changes in ecosystem areas to monitor deforestation is not enough - we need to know what this means in terms of 3-dimensional parameters such as forest structure and volume. This will help us estimate changes in ecosystem service provision, for example. There are some exciting satellites being launched with this capacity, and drone-mounted instruments are becoming smaller and cheaper. So the ability to be able to monitor 3-dimensional forest characteristics will soon be in the hands of a lot more researchers.

Do you think there is a gap between scientists and decision makers when it comes to protecting our environment? How do you say so? If yes, as a scientist, what do you think should be done to overcome this gap? If no, what needs to be improved?

It depends where you are and what decision makers you are talking to, but I think that scientists and many decision makers are more aligned than we think. Many decision makers I interact with in

countries across Southeast Asia do want to make a decision that is sustainable, even though that decision may be constrained by prevailing economic and political considerations.

> *"..it's our job to communicate how important the environment is and provide decision makers with the evidence and tools* **to make the right decision.***"*

Of course, dialogue and cooperation between researchers and decision makers can always be improved, and I think that is the responsibility of researchers; it's our job to communicate how important the environment is and provide decision makers with the evidence and tools to make the right decision.

For those students and young professionals who are also interested in the study of the coastal environment using remote sensing technologies, what is the best advice that you could give to them? Should they be passionate about the environment to be successful in this research field?

To be successful you have to have fun! It's hard to be successful in a career if you don't enjoy it. So think about what you enjoy, and try to find a career that allows you to do that. For me, it's the freedom to pursue my own intellectual curiosities, and to work in collaborative teams. But for others it will be different.

It's also important to find a mentor you trust. This does not have to be your graduate advisor, it can be someone else in your department, or it may be someone in industry. These people are important because they can give you unbiased advice, and they can become your advocate and help you enter new networks and opportunities.

THE 40TH
ASIAN CONFERENCE
ON REMOTE SENSING
ACRS 2019

Photo by Adli Wahid on Unsplash

The **Asian Conference on Remote Sensing (ACRS 2019)** will be held in Daejeon, South Korea from October 14-18, 2019 with the theme "**Progress of Remote Sensing Technology for Smart Future.**" The local organizing committee of the ACRS and the Asian Association on Remote Sensing have consistently organized student activities within the conference and collaborates with the ISPRS Student Consortium for the summer school.

1. Student Session

The Student Session is a session dedicated to presentations about universities across Asia with degree programs and research in the fields of remote sensing, photogrammetry, GIS, and other geospatial information sciences. Students are required to give a 10-minute presentation about their university, their research laboratory, ongoing research by students, and student activities. The tentative schedule of the Student Session is on October 16, 2019.

If you are interested to present or would like to nominate your student to present, please send an email to **Ms. Sheryl Rose Reyes (**sherylrose.reyes @gmail.com**)**.

2. WEBCON9

On its 9th year, WEBCON has challenged students and young researchers in developing web materials related to geospatial information sciences. WEBCON provides an opportunity for demonstrating the usefulness of these web materials. Three (3) winners will be selected; each receiving either Gold, Silver, or Bronze prizes.

Students and young scientists who are less than 35 and have registered for the ACRS can submit their proposals and preliminary works to the WEBCON Secretariat. WEBCON is open to individuals or teams composed of up to 3 people.

For more information, please visit http://acrs2019.org/ sub/webcon.asp. Deadline for submitting entries is on **September 2, 2019**. Please send your entries to secretariat@acrs2019.org.

3. Student Night

The Student Night is a social gathering for students and young researchers. The event will be on the evening of **October 16, 2019**.

4. The ISPRS SC Summer School

One of the major activities of the ISPRS SC is the summer school, which aims to provide an opportunity for students and young researchers to participate in a series of lectures, practical sessions, technical tours, and social events at a minimum cost as well as to provide an avenue for the participants, lecturers, and host countries to establish and widen their professional networks. The ISPRS SC has been collaborating with AARS in organizing summer schools after ACRS.

This year, the summer school will be held in Korea University, Seoul, South Korea from October 20 to 25, 2018 with the theme of "**New Remote Sensing Technology for Smart Future.**" For information and registration details, please visit the ACRS Website at http://acrs2019.org/sub/school.asp

OPPORTUNITIES & FELLOWSHIPS

- Postdoctoral Fellow (Oceanographer), Masdar Institute Campus, Khalifa University of Science and Technology, Abu Dhabi (UAE)

    Deadline: No particular deadline

    http://www.isprs.org/uploads/jobs/190623_Postdoctoral_Fellow_KU_Ocean2.pdf

- Post-Doctoral Researcher Position in Ocean Color Remote Sensing, Department of Water and Environmental Engineering, Khalifa University, Abu Dhabi

    Deadline: No particular deadline

    http://www.isprs.org/uploads/jobs/190623_Postdoctoral_Fellow_KU_RS2.pdf

- PhD position in Deep Learning for Satellite Image Analysis

    Deadline: No particular deadline

    http://www.grss-ieee.org/opportunities/phd-position-in-deep-learning-for-satellite-image-analysis/

- Researcher position Geomatics Division – Geodesy and Navigation Department, Centre Tecnològic de Telecomunicacions de Catalunya (CTTC), Castelldefels – Barcelona, Spain

    Deadline: No particular deadline

    https://www.isprs.org/uploads/jobs/190604_CALL12-2019-1.pdf

- Assistant Professorship in Remote Sensing of Global Environmental Change, Department of Geography, Simon Fraser University, Burnaby, BC,USA

    Deadline: August 30, 2019

    http://www.isprs.org/uploads/jobs/190623_Ad_-_RS_GEC-Final-June17.pdf

upcoming events
# SEPTEMBER 2019

SEPT. 01-06	**ISPRS WG II/8** 27th CIPA International Symposium Documenting the past for a better future		
	Avila, SPAIN	Gonzalez-Aguilera / Fabio Remondino +34 625399698 daguilera@usal.es; remondino@fbk.eu	www.cipa2019.org
SEPT. 03	**Gi4DM Radar Training Tutorial** An Inter-Union URSI-ISPRS Cooperation Advanced Radar Methods and their Application in Disaster Management		
	Prague, CZECH REPUBLIC	Lena Halounova halounov@gmail.com	
SEPT. 03-06	**ISPRS ICWG III/IVA** GI4DM : GEOINFORMATION FOR DISASTER MANAGEMENT		
	Prague, CZECH REPUBLIC	Tullio Joseph TANZI +33 (0)4 93 00 84 11 tullio.tanzi@telecom-paristech.fr	www.gi4dm2019.org
SEPT. 09-13	**57TH PHOTOGRAMMETRIC WEEK** PHOWO 2019		
	Stuttgart, GERMANY	phowo@ifp.uni-stuttgart.de	phowo.ifp.uni-stuttgart.de
SEPT. 11-14	**AGSE 2019** Applied Geoinformatics for Society and Environment		
	Stuttgart, GERMANY	Dietrich Schröder agse@hft-stuttgart.de	applied-geoinformatics.org
SEPT. 16-20	**ISPRS TC I & WG I/10** Workshop and Summer School on the Evaluation and Benchmarking Sensors, Systems and Geospatial Data in Photogrammetry and Remote Sensing		
	Warsaw, POLAND	Krzysztof Bakuła +48 222347694 +48 222341578 krzysztof.bakula@pw.edu.pl	ptfit.sgp.geodezja.org.pl/ workshop2019
SEPT. 18-20	**ISPRS ICWG II/III** PIA19: Photogrammetric Image Analysis 2019		
	Munich, GERMANY	Uwe Stilla +49 89 289 22670 +49 89 289 23202 stilla@stilla.de	pia.tum.de
SEPT. 24-25	**ISPRS WG V/7** International Workshop Measurement, Visualisation and Processing in BIM for Design and Construction Management		
	Prague, CZECH REPUBLIC	Karel Vach +420608982026 vach@eurogv.cz	mvpbim2019.org
SEPT. 24-27	**ISDE 11** 11th International Symposium on Digital Earth Digital Earth in a transformed Society		
	Florence, ITALY	info@digitalearth2019.eu	www.digitalearth2019.eu
SEPT. 26-27	**ISPRS WG IV/10** 14th 3D GeoInfo 2019		
	Singapore, SINGAPORE	Kean Huat SOON +65-64783537 +65-63239937 soon_kean_huat@sla.gov.sg	www.3dgeoinfo2019.com

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It has always been our pleasure to serve you!
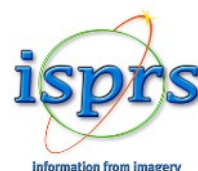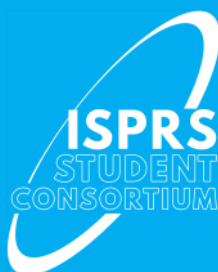
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ISPRS STUDENT CONSORTIUM

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information from imagery