NUS National University of Singapore | Department of Geography
Faculty of Arts & Social Sciences

12th

Geography Graduate Research Workshop

Worlds of Repair

26 April 2024 (FRI) | 9:00AM -6:00PM

Programme Booklet

Welcome to the NUS Geography Graduate Research Workshop 2024!

This is the twelfth iteration of the Workshop that marks the culmination of the Department of Geography's Graduate Research Seminar (GRS) course each year. All graduate research students in the Department of Geography are required to complete the GRS during their first year of studies. The class includes both Master's and PhD students, some of whom only commenced their studies in January. This year's class comprises seventeen graduate research students from a variety of academic and national backgrounds – from China, Hong Kong, Indonesia, the Maldives, the Netherlands, and the United Kingdom, as well as Singapore. Equally varied is the range of research topics that members of the class are engaging with, as is evident from the abstracts included in this programme.

The Workshop, this year framed collectively in terms of Worlds of Repair, showcases students' individual research projects. Within fifteen minutes, each student will present some or all of the 'what?', 'why?' and 'how?' of their research, describing their respective projects, placing each in its academic context, outlining the significance of their planned work, and detailing how they aim to tackle the underpinning puzzles and problems. Some of the students may even be in a position to present preliminary findings of their research. Most, however, will focus on research that they propose to carry out during the remainder of their time in the Department. It is not easy to expose ideas to scrutiny when, often, much is unsure and unclear. As in previous years, however, the intention of the Workshop is that students learn from presenting their research ideas, and from receiving constructive feedback.

For many of the students involved, the Workshop has been their first experience of organising and hosting an academic event. I am sure that they have gained much from the experience. The fact that the GRS students have managed to plan and host the Workshop while also developing their own presentations is commendable. Thank you and well done!

I hope you enjoy the presentations and invite you to participate actively in the discussion – both during formal Question and Answer time and more informally during tea breaks and lunchtime.

Professor Tim Bunnell
Convenor of GRS 2024

Workshop Introduction: Worlds of Repair

"[R]epair and maintenance are vital parts of the relays of everyday life [...]. Without them, life would be impossible" (Graham & Thrift, 2007, p. 20).

We live in a time of overlapping challenges: the changing climate, a recent global health pandemic, geopolitical conflicts, and rising social inequalities.

The 12th Geography Graduate Research Workshop seeks to engage these multiple, interconnected and seemingly intractable challenges through the lens of repair. Repair presents opportunities to repair relations and damages across different domains. We seventeen graduate research students are researching a range of social and ecological issues in need of repairing. Our research has been organised into five Worlds of Repair, each forming a cluster of presentations:

1) Unravelling Sociotechnical Worlds
2) Sustainable Development and Health Dynamics
3) Tropical Forests and Croplands
4) Wetland Science and Governance
5) Reef Accretion, Restoration, and Island Dynamics

Perhaps the opportunities for repair ought to be emphasised, as it might be overly ambitious to claim that our research will all produce solutions that repair social-ecological relations and damages. It is important to be wary of offering quick and easy, technocratic, market and policy solutions that may be counterproductive and end up reinforcing the unsustainable status quo (Borras et al., 2022). Instead, recognising that these issues are not easy to repair and (re)solve, it would be more realistic to highlight the opportunities and to start engaging with them.

We invite you to explore the Worlds of Repair with us. We believe that our world(s) can and must be reimagined through interdisciplinary conversations and knowledge co-production that straddle various research interests, topics and field locations. May this Workshop spark further questions into our social and ecological realities. More importantly, may it (re)kindle hope for a future more repaired than the present!

Graduate Research Students
Class of 2024

References:

- Borras Jr, S. M., Scoones, I., Baviskar, A., Edelman, M., Peluso, N. L., & Wolford, W. (2022). Climate change and agrarian struggles: an invitation to contribute to a JPS Forum. The Journal of Peasant Studies, 49(1), 1-28.
- Graham, S., & Thrift, N. (2007). Out of order: Understanding repair and maintenance. Theory, Culture & Society, 24(3), 1-25.

PROGRAMME

08:30 - 09:00	Registration	
09:00 - 09:05	Welcome Address: Prof. David Taylor, Head of Department	
Cluster 1	**Unravelling Sociotechnical Worlds**	
09:05 - 09:30	'Performing Race': Negotiating Racial Mixedness on Social Media and in Everyday Spaces in Multicultural Singapore	Madeleine Shutler
09:30 - 09:55	Conceptualising Queenstown Health District: Social prescribing, flow, and the biosocial	Wong Kai Wen
09:55 - 10:20	The "KPI-Ification" Of Labour: Data-Mediated Management Practices in Airport Operations at Schiphol	Naomi Veenhoven
10:20 - 10:45	Singapore in Space: The Sociotechnical Imaginaries of Satellite-Makers	Robert Krawczyk (Rob)
10:45 - 11:00	Coffee/Tea Break	
Cluster 2	**Sustainable Development and Health Dynamics**	
11:00 - 11:25	Geopolitical Disruptions and Supply Chain Resilience: An Analysis of the Russia-Ukraine Conflict's Impact on the European Union's Supply Chains	Kang Siyuan (Catherine)
11:25 - 11:50	Sustainability and Profitability: Co-Analysis of Impact Investing	Han Baoyan (Olivia)
11:50 - 12:15	The Human-Centered Strategies to Mitigate the Street Thermal Environment	Zhou Yangyang
12:15 - 12:40	Assessing the Impact of Urban Green Spaces on Human Health	Xu Dong
12:40 - 13:40	Lunch	
Cluster 3	**Tropical Forests and Croplands**	
13:40 - 14:05	Biophysical feedback of forest natural regrowth on climate in Tropical Moist Forest	Zou Yiguang
14:05 - 14:30	Carbon Flux of a Fragmented Tropical Rainforest in a Highly Urbanized Environment: A Case Study of Singapore's Bukit Timah Nature Reserve	Ng Tan Ting (Diane)
14:30 - 14:55	Understanding Southeast Asia's Agricultural Landscapes via Socio-Ecological Systems	Chua Wee Han
14:55 - 15:10	Coffee/Tea Break	
Cluster 4	**Wetland Science and Governance**	
15:10 - 15:35	Freshwater Microplastic Pollution: Too little too late... to repair?	Kyle Weston
15:35 - 16:00	Governing urban freshwater wetlands: Conservation, restoration and creation in Singapore and wider Southeast Asia	Mark Chong
16:00 - 16:25	Peatland as a new carbon frontier: Carbon market reterritorialization . effects on people, organisations, and nature's in Indonesia's tropical Peatland	Yustina Octifanny (Fanny)
16:25 - 16:40	Coffee/Tea Break	
Cluster 5	**Reef Accretion, Restoration and Island Dynamics**	
16:40 - 17:05	Contemporary rates of coral reef growth in Maldives and Singapore	Law Mei Ting
17:05 - 17:30	Modelling Reef Island Dynamics and Future Trajectories of Change	Maumoon Saleem
17:30 - 17:55.	Stabilization of steep rubble slopes to induce natural coral reef recovery	Hazel Oakley
17:55 - 18:00	Closing Address: Prof. Tim Bunnell, Convenor of Graduate Research Seminar	
18:00	Photo-taking and clean up	

Cluster 1: Unravelling Sociotechnical Worlds

‘Performing Race’: Negotiating Racial Mixedness on Social Media and in Everyday Spaces in Multicultural Singapore

Abstract

My research looks at the lived experiences of individuals who are racially mixed, and thus do not fit neatly within Singapore’s standard construction of race under the CMIO framework. This framework pervades both policy and practice in the everyday, reinforcing notions of who constitutes as a Singaporean (monoracial) and conversely who is an ‘Other’ (racially mixed). Through a qualitative study incorporating participatory story mapping, my research explores how mixed race individuals perform and negotiate their race in everyday moments of disjuncture within offline (through the body) and online spaces (through social media, taken as an extension of the body). How do these disjunctures differ across different kinds of online versus offline spaces? How do these encounters demonstrate how mixed race individuals negotiate ‘passing’ and ‘non-passing’? How is ‘(non-)passing’ mediated through the performance of the (digitalised) body? Does social media create a third space of belonging for racial mixedness or, conversely, reinforce national classifications of race? My research considers passing and performativity of mixed race, with a post-colonial lens, aiming to contribute to understandings of how mixed race is (de-)constructed through the racialised body within the digital turn.

Madeleine Clare Shutler, Master’s Student

Madeleine is a Master’s by Research student in Geography. She completed her Bachelor of Social Sciences (Geography) at the National University of Singapore, and had a short stint in the public sector at JTC Corporation, before venturing back into geographical research. Madeleine is keenly interested in the fields of critical mixed race studies and feminist geographies.

Conceptualising Queenstown Health District: Social prescribing, flow, and the biosocial

Abstract

Launched in 2021, the Queenstown Health District (QHD) provides a testbed for pilots that promote active and healthy ageing in Singapore which is among the world's most rapidly ageing countries. The QHD represents a site where ageing is "repaired" and "healthy longevity" is experimented with "worldly" implications. Indeed, Singapore is a member of the Global Network for Age-friendly Cities and Communities established by the World Health Organisation (WHO) to facilitate knowledge-sharing of age-friendly best practices around the world. The QHD is in turn bound up with wider shifts in the national healthcare system towards a focus on preventive care within the community i.e. the Healthier SG programme, against the backdrop of a rapidly ageing population.

My proposed research aims to uncover how older residents in Queenstown relate to the programmes and infrastructures that have been curated to enhance their health and wellbeing. To do this, I propose an analytical framework comprising the following key concepts: social prescribing, flow, and the biosocial, as well as their interactions. In this presentation, I invite you to join me on the conceptual journeys that I have taken so far in, through and beyond the QHD.

Wong Kai Wen, PhD Student

Kai Wen is an urban planner at Singapore's Urban Redevelopment Authority, and he recently obtained a Master in Gerontology from the Singapore University of Social Sciences (SUSS). HIs research interests revolve around ageing, health and wellbeing, the built environment, and their intersections.

The "KPI-Ification" Of Labour: Data-Mediated Management Practices in Airport Operations at Schiphol

Abstract

Key Performance Indicators (KPIs), omnipresent in the corporate world, serve as a method to monitor and measure a company's overall progress and success by establishing indicators for every aspect of business operations. My research investigates how KPIs and other data-mediated management tools and practices are approached, interpreted, and legitimised in the workplace through an ethnographic case study of operational management at Schiphol Airport, the Netherlands. To study the effects of data-mediated management, I focus on the experiences of middle managers who are both managing with and managed by data as they interact with operational workers and higher management. The two questions addressed in my research are: (1) What operations, logics, subjectivities, and modes of power emerge in the increasingly digitised operational workplaces of Schiphol Airport?; (2) How do middle managers navigate the use and effects of contemporary forms of data-mediated management? In logistics, datafication is often heralded as a path towards an efficient utopia while, to the contrary, critical digital scholars show how technological innovation exacerbates exploitation. My research attempts to bridge this divide by providing a reparative reading of sociotechnical labour relations in a logistics landscape.

Naomi Irene Veenhoven, PhD Student

Naomi is a PhD student from the Netherlands. Previously, she studied at the Design Academy Eindhoven, where she fell in love with ethnographic research. She then completed her BA in Cultural and Social Anthropology at the University of Amsterdam (UvA), with an interdisciplinary minor in Art and Research at the Gerrit Rietveld Academy. She continued with a Research Master's in Social Sciences at the UvA, for which she conducted an ethnographic study on operational workers in delivery logistics. Naomi is fascinated by sociotechnical entanglements and the way technological innovations are changing our everyday lives.

Singapore in Space: The Sociotechnical Imaginaries of Satellite-Makers

Abstract

This project aims to follow space workers as they build and market satellites in Singapore. Singapore is positioning itself as a global hub for Very Low Earth Orbit satellites flying in formation to provide communications, imaging, and climate monitoring. Singapore is home to over sixty space companies, comprising local space start-ups, international companies, government defence organisations, and university satellite centres. I describe the international networks of space workers engaged in making and marketing satellites in Singapore, exploring how sociotechnical imaginaries are forged by “New Space” companies, government, and media. How is space promoted, publicised and broadcast by Singapore’s Office for Space Technology & Industry? What moves and motivates private space companies to make satellites in Singapore? How do experiences of repair and failure figure in the ‘conjuring’ of space imaginaries? How do smallness and city-state-ness figure in Singaporean space imaginaries? How does airflight, and the mobility of space workers overseas, inform comparative visions of Singapore in space? Utilising British and Singaporean archives, I explore how sociotechnical and geopolitical imaginaries of space satellites in Singapore are entangled with older, imperial and Cold War imaginaries spanning Afro-Asia. My research attends to an understudied geography of outer space in Southeast Asia.

Robert Krawczyk, PhD Student

Rob is a PhD student in the Politics, Economies and Space research group. He holds a BA in Geography from the University of Oxford, an MA in Research Architecture from Goldsmiths, University of London, and an MA in China Studies from Peking University. Previously, he worked as a Research Assistant at Forensic Architecture, and as an Associate at PwC. His doctoral study aims to explore how satellites are imagined, made, and marketed in Singapore, informed by postcolonial Science and Technology Studies (STS), social studies of outer space, and critical geopolitics.

Cluster 2: Sustainable Development and Health Dynamics

Geopolitical Disruptions and Supply Chain Resilience: An Analysis of the Russia-Ukraine Conflict's Impact on the European Union’s Supply Chains

Abstract

My research investigates the impact of the Russia-Ukraine conflict on the supply chains of the European Union (EU), highlighting how geographical vulnerabilities and strategic resilience mechanisms are influenced by geopolitical disruptions. It addresses a significant research gap by focusing on the geographical factors that affect supply chain resilience in the face of such conflicts. I adopt a methodological framework that combines supply chain network analysis and economic impact assessments to explore the conflict's effects on trade flows and regional supply chain dependencies within the EU. The anticipated findings would offer a comprehensive understanding of the geographical dimensions of supply chain disruptions and provide actionable insights for enhancing the resilience of supply chains against geopolitical risks. My research is expected to contribute valuable perspectives to the fields of supply chain management and geopolitical studies, offering guidance for policymakers and business leaders in developing strategies to navigate and mitigate the impact of geopolitical disruptions on supply chains.

Kang Siyuan, PhD Student

Kang Siyuan (Catherine) is a current PhD student at the National University of Singapore (NUS), where she delves into the complexities of global trade, supply chain analysis, network analysis, Geographic Information Systems (GIS), and spatial visualization. She holds a bachelor's degree in Geographic Information Science from Wuhan University, demonstrating her early commitment to understanding the spatial aspects of complex systems. Building on this foundation, she pursued and completed a Master’s in Applied GIS at NUS. Catherine's research interests lie at the intersection of geography and global commerce, focusing on how spatial data and GIS technologies can uncover insights into supply chain vulnerabilities and efficiencies.

Sustainability and Profitability: Co-Analysis of Impact Investing

Abstract

My research endeavours to scrutinise the efficacy of impact investments in reconciling profitability with sustainability, focusing on socio-environmental repair. Despite their growth, a discord exists between the purported and actualised socio-environmental outcomes of these investments. I aim to bridge research gaps by developing standardised metrics for evaluating such investments' effectiveness and discerning the congruence between intended and realised impacts across diverse socio-demographic cohorts. Employing a mixed-methods approach, my research will leverage quantitative data from environmental and social metrics, enriched by qualitative insights through stakeholder interviews. Focused geographically on Cambodia, due to its unique socio-environmental challenges, the study will conduct comparative analyses within and between regions of similar economic and environmental fabric. The anticipated findings are poised to make substantive contributions to both academic discourse and policymaking by advocating for greater transparency and accountability in impact investments, while also enhancing the understanding of their socio-environmental benefits. The significance of this research lies in its potential to contribute to policy formulation and academic literature by providing a nuanced understanding of the actual effectiveness of impact investments, enhancing accountability and efficacy within the sector, and supporting informed decision-making that promotes genuine sustainability.

Han Baoyan, PhD Student

Baoyan is passionate about the intersection of finance, geography and data, specialising in impact investing, spatial big data, and sentiment analysis. She completed her Master's degree at UCL, delving into spatio-temporal analytics and big data mining, an experience that sharpened her research and analytical skills. Her Bachelor’s degree was attained at the University of Liverpool, where she majored in Mathematics with Finance, a discipline that established her quantitative proficiency and fuelled her interest in the financial aspects of sustainability and technological innovation.

The Human-Centered Strategies to Mitigate the Street Thermal Environment

Abstract

Urbanization trends project a significant increase in the global urban population by 2050. However, the confluence of urbanization and climate change poses serious health risks to urban dwellers, exacerbated by rising temperatures and extreme weather events. Addressing urban heat pollution becomes paramount to safeguarding public health and enhancing quality of life. Thermal vulnerability is influenced by both natural and socio-economic factors, underscores the urgency of developing holistic assessment frameworks to identify high-risk groups. This research proposes a human-centered scalable assessment method to prioritize heat mitigation efforts at a street scale. Integrating street-level assessments with metrics of environmental, social, and demographic factors facilitates the identification of vulnerable street sections, informing targeted heat mitigation strategies. Through a multidisciplinary approach encompassing remote sensing, GIS-based analysis, and computer modeling, the study aims to assess street thermal comfort levels, identify high heat vulnerability areas, and recommend tailored mitigation strategies. By combining diverse datasets and advanced analytical techniques, this research contributes to urban resilience by facilitating informed decision-making and effective heat mitigation interventions tailored to local contexts.

Zhou Yangyang, Master's Student

Yangyang is a Master by Research student in the Tropical Environmental Change research group. Before joining NUS, she received a Bachelor's degree in Geographic Information Science and a Master's degree in Remote Sensing. With the experience from her previous work and education, her Master's research interests revolve around Urban climate, Urban planning and Geovisual Analytics. Her overarching aim is to leverage interdisciplinary insights to elevate health outcomes and enhance quality of life for communities worldwide.

Assessing the Impact of Urban Green Spaces on Human Health

Abstract

The global characteristics of the impact of urban green spaces (UGS) on human health amid rapid urbanisation around the world remain to be understood. In particular, there are significant gaps in understanding the equitable distribution and accessibility of UGS and their health benefits to different populations. My research aims to explore the mechanisms by which UGS affect health outcomes and address community inequalities. My approach makes use of geospatial artificial intelligence and Earth big data, including ongoing global monitoring of urban areas and new models using high-resolution imagery to assess the health benefits of UGS. This approach helped generate a comprehensive global map detailing the health benefits of UGS from 2001 to 2020, while also investigating spatial differences related to income, gender, ethnicity, education, and age. The significance of the expected results is to provide policymakers with evidence-based insights to prioritise investments in UGS to maximise health benefits and promote social equity. Through the lens of geospatial artificial intelligence, my research provides insights into the potential of UGS to mitigate urban warming and enhance global health, filling critical research gaps at the intersection of urban planning, public health, and environmental justice.

Xu Dong, PhD Student

Xu Dong is a PhD student in the Tropical Environmental Change research group. His research interests include global climate change and urban environment remote sensing. Before joining NUS, he obtained a Master's degree in Geographic Information Systems (GIS) from Beijing Normal University. His doctoral topic is urban greening and urban health, which aims to quantify the health effects of urban green spaces on a global scale and reveal the inequalities in these health effects around the world.

Cluster 3: Tropical Forests and Cropland

Biophysical feedback of natural regrowth on climate in Tropical Moist Forests

Abstract

Tropical moist forests can regrow naturally and rapidly after natural or human disturbances, presenting a promising opportunity to mitigate climate change and restore ecosystems. While previous studies have focused on the biogeochemical feedback of natural regrowth on climate, particularly carbon sequestration potential, its biophysical feedback such as the cooling feedback through evapotranspiration remains unclear and absent in global climate change assessments. To fill this gap, this study aims to combine new satellite observations and advanced statistical methods to quantify the biophysical feedback of natural regrowth on climate in tropical moist forests. The findings will provide valuable insights for evaluating the potential of natural regrowth as a nature-based solution.

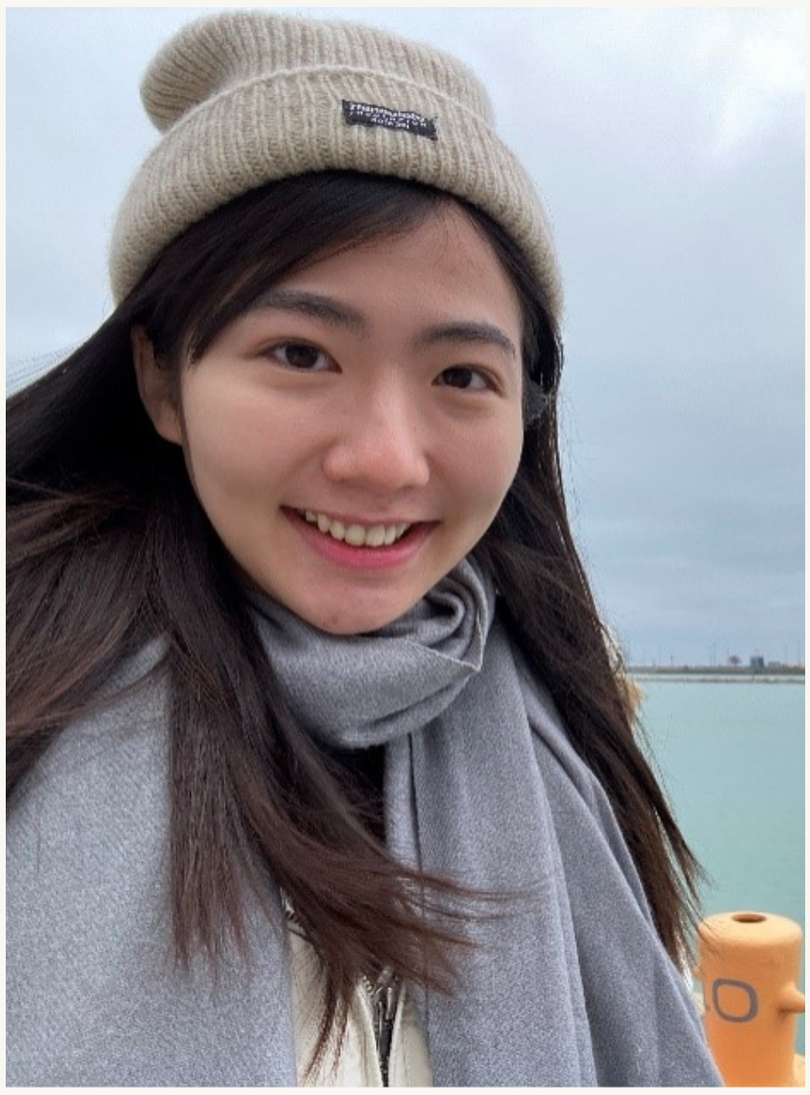
Zou Yiguang, PhD Student

Zou Yiguang (he/his) has interest mainly in terrestrial hydrology and ecohydrology. He holds a BSc in Hydrology (China University of Geosciences) and a Master of Mechanics (Southern University of Science and Technology, China). He also used to be an engineer at the China Geological Survey for five years. For his PhD thesis, he will study the feedback of land use and land cover change on the hydrological cycle in the tropics.

Carbon Flux of a Fragmented Tropical Rainforest in a Highly Urbanised Environment: A Case Study of Singapore's Bukit Timah Nature Reserve

Abstract

Tropical forests have a crucial role in the global carbon cycle, in which carbon storage and uptake are high in magnitude. However, deforestation and forest degradation (i.e., fragmentation, selective logging, and fire) have caused significant carbon emissions from tropical forests. Some tropical forests in the Amazon are losing their sink capacity or shifting into a net carbon source. Estimation of carbon emissions from forest degradation is particularly challenging, due to large uncertainties associated with the subtle contrast between intact forests and degraded forests, particularly when monitoring forest degradation and the possible change in carbon stocks in degraded forests at various temporal and spatial scales. My research aim to examine the impacts of forest fragmentation on plant traits based on observations from ground and remote sensing and develop a quantitative framework to quantify the impacts of fragmentation on the carbon cycle using functional traits (i.e., terrestrial biosphere models).



Ng Tan Ting Diane, PhD Student

Diane's work focuses on terrestrial ecosystem carbon flux. For her M.Phil. in Geography at the Chinese University of Hong Kong, she conducted research on photosynthesis in urban trees. For her PhD thesis, she would like to examine the impacts of forest fragmentation on carbon flux in tropical rainforests. There is a risk that forest degradation will drive tropical forests to shift from a net carbon sink to a carbon source and jeopardise our climate change mitigation efforts. She will examine environmental drivers of variation in plant traits and upscale leaf traits to simulate carbon flux in tropical rainforests.

Understanding Southeast Asia's Agricultural Landscapes via Socio-Ecological Systems

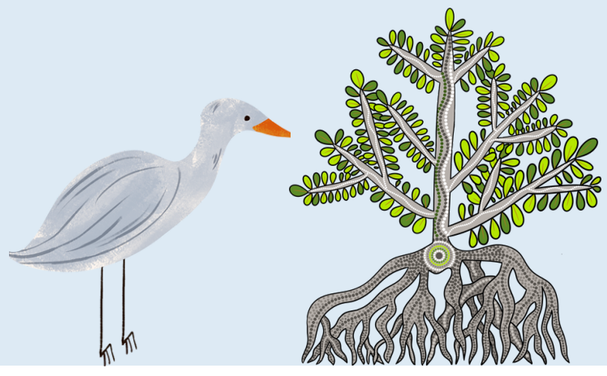
Abstract

Agricultural systems are crucial but complex to evaluate. In Asia alone, over 400 million people are food-insecure, while global warming and severe weather patterns will increase agricultural loss. In the global South, farmers are often poor smallholders and ageing, with an expected decline in cropping frequency due to lack of labour. What are the consequences of these factors on the agricultural system? Agriculture is the interface and confluence of climatic (temperature, precipitation) and social (economic, political) factors. To what extent do these factors affect farmer behaviour and where are the tipping points? My research attempts to locate and evaluate the sensitivity of these climatic and social factors in their impact on land-use changes, focusing on Southeast Asia, the world's rice bowl. Open-source high-resolution satellite imagery will be utilised to observe land-use changes ideally on a farm-plot level, while interviews with smallholder farmers will provide renewed understanding of the reasons behind changing behaviours such as cropping intensity or switching of crops.

Chua Wee Han, PhD Student

Wee Han uses remote sensing and machine learning approaches to understand agricultural resilience in rural agrarian landscapes of Southeast Asia, focusing especially on climatic and social factors. Prior to his PhD, he completed his M.Sc. in Applied Geographic Information Systems at NUS, writing his thesis on quantifying cultural ecosystem services in Singapore related to human-wildlife interactions. Before that, he completed a Bachelor's degree (with Honours) in Life Sciences at NUS, with his Bachelor's thesis focusing on potential avenues for mitigating the spread of fake news pertaining to climate change using priming/inoculation techniques.

Cluster 4: Wetland Science and Governance



Freshwater Microplastic Pollution: Too little too late… to repair?

Abstract

The pollution of the marine and terrestrial environments by plastic waste is now a worldwide problem. Slow rates of degradation result in their accumulation across aquatic ecosystems, where they slowly break down into successively smaller pieces – so-called microplastics. In recent years, the presence and threat of microplastics in (terrestrial) freshwater ecosystems has been recognised, yet basic understanding on their transport and fate is lacking. Singapore is highly urbanised, with lentic freshwater ecosystems such as reservoirs and quarries-turned-lakes that accumulate benthic sediments over time. These sediments will be sampled by coring for microplastic concentration and type, from the present-day benthic surface sediments to sediments dating back to the mid-20th century. Chironomid larvae, which consume microplastics at the interface between sediments and the water column (i.e., the benthos), offer an efficient tool for identifying microplastic occurrence and gleaning information on the processes involved and the extent to which microplastics are entering the food web. This information on historical trends and present-day spatial heterogeneities between lentic ecosystems in Singapore will contribute to understanding microplastic dynamics as well as predicting future trends and associated risks to the aquatic, particularly freshwater, environment.

Kyle Weston, PhD Student

Living near the Lake District, UK, Kyle has been fascinated with lake ecosystems since discovering their potential as archives of environmental changes during his BSc Geography studies at Manchester. He developed his passion during his MRes at Lancaster, where he reconstructed methane dynamics in a lake during the early Holocene, about ten thousand years ago. His PhD work is motivated by the desire to contribute to a positive relationship between humans and the environment, flowing from a belief that effective stewardship of the environment is not only a duty, but also crucial for a healthy society.

Governing urban freshwater wetlands: Conservation, restoration and creation in Singapore and wider Southeast Asia

Abstract

Freshwater wetlands are among the most threatened ecosystems, with substantial losses to area and biodiversity, accompanied by human impacts, such as displacement and loss of livelihoods. To redress the injustices to nature and society, governance of linked social-ecological systems must improve. Not only in rural but also urban contexts, where the integration of nature, including freshwater wetlands, with the built environment has been increasingly recognised. My research examines the urban case of Singapore, where freshwater wetlands have been conserved, restored and even created. I plan to critically assess the impacts of governance on social and ecological well-being. Social well-being looks at the extent that local freshwater wetlands are accessible and socially inclusive. Ecological well-being attends to ecosystem health, expressed by the quality of ecosystem services. Q methodology, supplemented by semi-structured interviews, may be conducted to gather the perspectives of governing actors. A questionnaire survey of the general public, alongside participant observations, may be employed to determine social and (indirectly) ecological well-being. The lessons learned could suggest how governance might be improved locally and, in turn, possibly adapted to other Southeast Asian cities – taking into account contextual similarities and differences. Ultimately, my hope is to repair social-ecological damages and enhance well-being.

Mark Chong, PhD Student

Mark is broadly interested in studying how humans relate to the environment and to each other. He hopes that by understanding these relations, possible ways forward could be suggested for the benefit of nature and society. Following his undergraduate education in Environmental Studies, he taught Geography as a Teaching Assistant at NUS. As a graduate student, he continues teaching Geography, and has completed a Master of Science in Biodiversity Conservation and Nature-based Climate Solutions. He enjoys being in nature and jogging, especially during sunset, admiring the sky and surroundings that evoke in him a sense of peace and gratitude!

Peatland as a new carbon frontier: Carbon market reterritorialisation effects on people, organisations, and nature in Indonesia's tropical Peatland

Abstract

My research explores the growing intensity of the market-based influences on carbon governance in Indonesia. As the new carbon market regime emerges, so does a new environmental frontier in Indonesia's peatlands with long resource and land enclosure histories. New territories were created for people and objects at different scales, including peatland landscapes, three-dimensional transboundary carbon emissions, global civil society movements, and the people inhabiting peatlands. I aim to examine the transformations happening at the macro-meso-micro scales of peatland governance, through the lenses of shrinking civic spaces, rural livelihood changes, land transformation, and the nexus of bodily harm and environmental degradation. My research explores the possibility of: 1) the emergence of hybrid peatland governance of market and non-market-based actors; 2) the selective enclosure of peatlands to local communities; 3) the extent of carbon commodification in peatland conservation and restoration; and 4) environmental and bodily harms on local people from peatland mismanagement. I intend to develop a framework to rework the land-resource frontier theory from the decolonial and feminist political ecology traditions, in conjunction with the contemporary challenges of growing interest in carbon commodification.

Yustina Octifanny, PhD Student

Fanny (she/her) studies the human-land nexus, specialising in political ecology, spatial inequality, migration, land transformation, livelihood, urbanisation, and informality. She is also a professional urban and regional planner by education and training. She holds a BSc (Bandung Institute of Technology) and a Master of Urban and Regional Planning (UCLA). For her doctoral research, she is interested in investigating the creation of carbon frontier following the emergence of carbon marketisation in Indonesia's peatlands. She focuses her studies on how local communities living on peatlands experience disproportionate burdens and shrinking civic spaces due to external actors' interests and influences.

Cluster 5: Reef Accretion, Restoration and Island Dynamics

Contemporary rates of coral reef growth in Maldives and Singapore

Abstract

Sea-level rise is expected to affect the rates of coral reef growth and its wave protection function which will result coastal areas becoming more prone to floods, threatening communities living on low-lying coastal plains adjacent to the reef systems. Currently, few studies have established the contemporary growth rates of reef crests and reef flats in the Southeast Asian region. There is also limited understanding of reef budgets in reef systems and its relation to reef accretion. Consequently, future projections are constrained by these gaps in information. My research will adopt a multi-pronged approach that combines field measurements with laboratory analysis to address the following research questions: (1) What are the contemporary growth rates of reef crests and reef flats in SEA? (2) Are modern rates of reef accretion occurring at the same pace as compared to the last 1000 years (late Holocene)? (3) How good are reef budgets at resolving physical reef accretion rates? (4) What is the future trajectory of physical reef growth potential based on the current rates of reef growth? The expected findings will establish temporal and spatial variability in contemporary reef growth rates and predictions of future reef growth.

Law Mei Ting, PhD Student

Mei Ting is a PhD student in the Tropical Environmental Change research group. She holds a MSc in Biodiversity Conservation and Nature-Based Climate Solutions from the National University of Singapore and a BSc in Business Management from the University of London. Previously, she worked as a Research Associate in the Sea Level Research group at the Earth Observatory of Singapore. Her doctoral study aims to establish the contemporary growth rates of coral reef crests and reef flats.

Modelling Reef Island Dynamics and Future Trajectories of Change

Abstract

Coral reef islands are the only habitable land for mid-oceanic island nations. While they are known to be highly dynamic, there is uncertainty about their response to climate change. Studies simulating the current and future dynamics of reef islands are rarely found. Recent studies that attempted to model reef islands conclude that further research is needed to study sediment transport due to reef hydrodynamics in numerical models. My research will apply a combination of field measurements and numerical modelling to answer the following questions: (1) How does seasonal variability in wave energy affect the sediment transport on the study islands? (2) How do reef island characteristics influence shoreline and vegetation line changes? (3) What are the limitations of existing numerical wave models when applied to complex atolls and how can these be overcome? (4) What are the limitations of shoreline models when applied to coral reef islands and how can these be overcome? (5) What are the projected impacts of different climate change scenarios on the morphology of coral reef islands? The expected outcomes of my research is the improved understanding of current and future reef island dynamics and a contribution to the development of efficient and accurate numerical modelling methods.

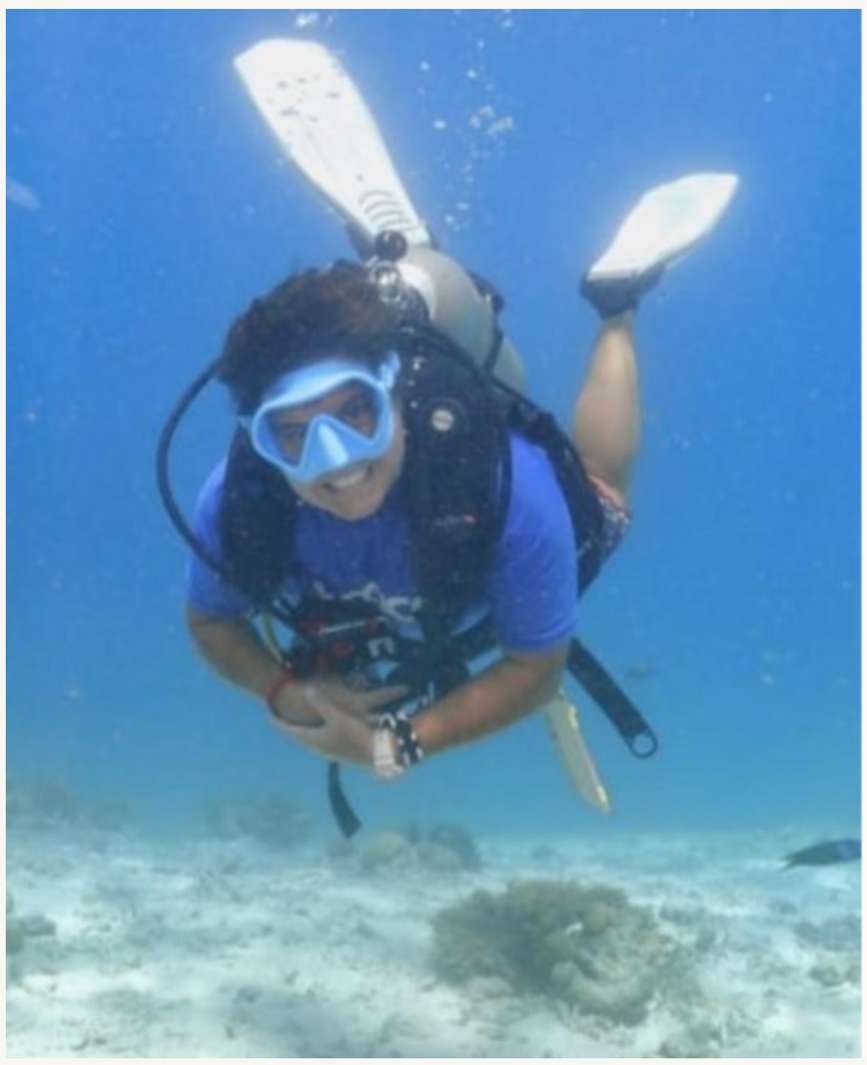
Maumoon Saleem, PhD Student

Maumoon is a civil and coastal engineer from the Maldives. He is pursuing his doctoral studies in the Tropical Environmental Change (TEC) group at NUS Geography. He holds a Master's Degree in Water and Sustainable Development with a focus on Water Hazards, Risks, and Climate Change, and a Bachelor's Degree in Civil Engineering. His research interests include the short and medium-term morphological changes of coral reef islands.

Stabilization of steep rubble slopes to induce natural coral reef recovery

Abstract

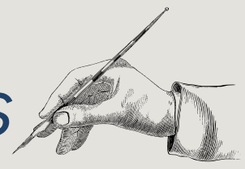
Across South East Asia, steep rubble reef slopes have been created, on former coral reefs, by destructive fishing practices. Once the destruction has ceased, the inherently unstable nature of this mobile substrate precludes natural recovery. A pilot study has demonstrated that structures which act as both a barrier to the movement of rubble, and as a baffle to the flow of water can induce significant natural recovery. However the scale of recovery varied from almost nothing to complete restoration. Accordingly, the parameters that influence slope stabilization and coral larval settlement are to be investigated. The principal work is to be a field based comparative study in order for the many abiotic variables involved in slope stabilization to be quantified and compared. Laboratory studies to support the field work are also planned. Additionally, there are a number of potential associated investigations available at this stage. Possibilities include a classification system for rubble, investigations into Indo-Pacific coral species carbonate budgets, and the impacts of bioturbators and bioeroders on unconsolidated substrates.



Hazel Oakley, PhD Student

Hazel is a marine conservationist with more than 20 years experience in the field. Since graduating with a degree in zoology she has worked exclusively on the marine ecosystems of Borneo, particularly the Malaysian state of Sabah. Accordingly, she has a deep understanding of the biodiversity of tropical aquatic ecosystems and the extensive human impacts upon them. Her research aims are focused on the development of low-tech, low-cost, low-maintenance restoration solutions to widespread degraded reef conditions.

Notes



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