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Editorial

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Seagrass research in Southeast Asia

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Southeast Asia is a biologically diverse region with a high diversity of marine species globally (Groombridge and Jenkins 2002, Spalding et al. 2003, Kulbicki et al. 2013, Huang et al. 2015). Bordered by the Bay of Bengal to the west, the Indian Ocean to the South, and the Pacific Ocean to the east, this region has approximately 117,763 km of coastline (Fortes et al. 2018), and two of the largest archipelagic nations (Indonesia and the Philippines) in the world. The region is also undergoing rapid economic development and coastal change, with many marine ecosystems being threatened by anthropogenic activities and, by extension, environmental change (Wilkinson and Salvat 2012).

The coastal and maritime nature of the region translates into a close relationship between the sea and marine resources, with the cultures, communities, and economies of this region (Hung et al. 2013). Traditional seafaring coastal communities are the norm and access to both nearshore and offshore fishing grounds support both commercial and subsistence industries (Bailey and Pomeroy 2008). Seagrass habitats play an important role in the biological, socio-cultural and economic landscape in Southeast Asia (Unsworth and Cullen 2010), but suffer disproportionately in terms of conservation priority. More attention is placed on charismatic habitats such as coral reefs, and fauna, such as the very dugongs and turtles that rely on seagrass habitats. Seagrasses are declining at an unprecedented rate globally (Orth et al. 2006), but information on the loss of seagrass habitats in Southeast Asia is limited, although there is growing evidence of widespread decline and loss throughout the region (Yaakub et al. 2014, Unsworth et al. 2018). Accurate and reliable estimates of seagrass cover and extent in this region are hampered by the paucity of long term monitoring data and freely available information (Waycott et al. 2009). Much of the early research on seagrass in Southeast Asia was concentrated in Indonesia and the Philippines, but the publications and study sites in these early papers are clustered around Northwest Luzon in the Philippines and South Sulawesi in Indonesia (Ooi et al. 2011).

Despite the lack of publications from the Southeast Asian region, it was apparent during the last International Seagrass Biology Workshop (ISBW) in Wales in 2016, that there is active seagrass research being carried out in small pockets in Southeast Asia. What was deemed lacking was a platform for seagrass scientists in the region to connect and share their work and information. Another common thread from researchers from the Southeast Asian region was that the research is often too small in scale and possibly too localised to be of interest to scientific journals and that this is further hindered by issues arising from fluency in English. This special issue presents an opportunity to bring together the research being carried out across the Southeast Asian region. Ten original research manuscripts and one review have been compiled for this special issue to highlight the trends in research themes, from across the region.

Knowledge on seagrass is increasing across Southeast Asia, with a variety of research themes emerging resulting from access to technology and resources, but is hampered by lack of coordination and collaboration within the region (Fortes et al. 2018). The review by Fortes et al. (2018) highlights locations within the Southeast Asian region where information and research on seagrass resources remain limited, such as in the Andaman and Nicobar Islands, Cambodia, Myanmar, Timor Leste, and Viet Nam. Within this special issue, information on aspects of seagrass community ecology (Phan et al. 2018), fisheries (Jones et al. 2018), and biogeography (Savurirajan et al. 2018), are emerging from some of these data-deficient areas. Remote sensing and the availability of quality license-free satellite imagery has created an opportunity not only for plugging the knowledge gaps in the distribution, location, and extent of seagrass habitats in Southeast Asia, but in monitoring meadow-scale changes and dynamics of seagrass beds (Bramante et al. 2018).

Environmental factors are key drivers which determine where and how seagrass meadows form and how they are maintained. For example, seagrass habitats in Southeast Asia lie mostly in shallow, semi-enclosed coastal systems and large estuaries, where tidal fluctuations bring about considerable daily and seasonal variations in key drivers like light availability and salinity. Here we see that fluctuations in physicochemical parameters such as irradiance (Phandee and Buapet 2018) and salinity (Kongrueang et al. 2018) can affect seagrasses at...
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of seagrass meadows in the region.

Seagrass meadows are a habitat and nursery grounds
for myriad flora and fauna, supporting complex food
webs, and are a primary source of income and nutrition
for coastal communities and artisanal economies. The
trophic interactions found in tropical seagrass meadows
are poorly understood, despite being an important aspect
of seagrass meadow maintenance, and the work of Fong
et al. (2018) documents the diversity of gastropod grazers
in seagrass meadows, as well as important trophic path-
ways between seagrasses, their associated epiphytes and
the gastropod grazers that feed on them. The overexploit-
tation of seagrass fauna could have important conse-
quences for seagrass meadows and the communities that
rely on them for food provisioning services. This is espe-
cially important in data deficient areas such as Myanmar,
where a depauperate diversity of motile fauna could be
heralding larger complications for marine ecosystems in
the region (Jones et al. 2018). Such case studies further
highlight the importance of rapid attention and conserva-
tion action that is required to stem the continued decline
of seagrass meadows in the region.

Seagrass restoration is necessary to stem seagrass
decline and to return seagrass meadows to a healthy
state and is able to provide critical ecosystem services
(Orth et al. 2006, van Katwijk et al. 2016). While sea-
grass restoration is not new in Southeast Asia, there has
been varying degrees of success in the survival of trans-
(2018) in this special issue report on a novel approach
of transplanting mixed-seagrass species combinations
and found that transplantation increased with species
richness. This could inform future seagrass restoration
efforts in the Southeast Asian region, as most meadows
are multi-specific.

Widespread anthropogenic threats to seagrass habi-
tats and the rapid rate of coastal change in the region call
for quick and decisive action on seagrass conservation.
This may not always be feasible when there is a paucity
of information on the seagrass meadows. Tan et al.
(2018) propose a simple method for prioritising sites
for conservation based on a combination of two well-
de fined indexes: ecosystem service assessments and
habitat vulnerability analyses. The proposed method can
be carried out with basic information and can incorpo-
rate expert opinions of site managers, and can be used
as a decision support tool to support conservation and
management action.

Conservation of seagrass meadows will ultimately rely
on the ability of scientists and managers to work together
across the region to effect a change in the attitudes of
people towards seagrass habitats, and the review paper
in this special issue provides a roadmap for seagrass con-
servation in the region (Fortes et al. 2018). The proposed
roadmap hinges on increasing public awareness and
involvement, the collaboration and knowledge sharing
of seagrass practitioners across the region, and a deeper
understanding of the socio-cultural-economic landscapes
of communities which are reliant on seagrass meadows.
The research presented in this Special Issue on Seagrass
Research in Southeast Asia is hopefully just the tip of the
iceberg in terms of the potential for seagrass science in the
region. It also represents a small step towards the action
needed in order to address the pressing issues facing sea-
grass meadows in Southeast Asia.

“These considerations should lead us to look upon all the works
of nature, animate or inanimate, as invested with a certain sanc-
ty, to be used by us but not abused, and never to be recklessly
destroyed or defaced.” (Alfred Russell Wallace)

References
Arriesgado, D.M., H. Kurokoci, Y. Najajima, Y. Matsuiki, W.H. Uy,
 Genetic diversity and structure of the tropical seagrass Cymo-
docea serrulata spanning its central diversity hotspot and
 Species richness effects on the vegetative expansion of trans-
 Bailey, C. and C. Pomeroy. 2008. Resource dependency and devel-
opment options in coastal Southeast Asia. Soc. Nat. Res. 9:
191–199.
biomass and area changes in a multi-species meadow in
Singapore: application of multi-resolution satellite imagery.
 Fong, J.M., S. Lai, S.M. Yaakub, Y.X. Ow and P.A. Todd. 2018. The diet
and feeding rates of gastropod grazers in Singapore’s seagrass
 Fortes, M.D., J.L.S. Ooi, Y.M. Tan, A. Prathep, J.S. Bujang and S.M.
Yaakub. 2018. Seagrass in Southeast Asia: a review of status
and knowledge gaps, and a road map for conservation. Bot.


