Nationwide seagrass mapping using analysis-ready Sentinel-2 and PlanetScope data to support the Nationally Determined Contributions of Seychelles

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Wissen für Morgen



SEYCHELLES' NATIONAL CLIMATE CHANGE POLICY

"Making Seychelles Climate Resilient"



May 2020

SDG 14: Conserve and sustainably use the Oceans, Seas and Marine Resources for Sustainable Development.

→ Protection of blue carbon such as mangroves and seagrasses



EO-driven coastal ecosystem accounting



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Funding

Acknowledgments

Conflicts of Interest

References



Abstract

Seagrasses are traversing t

Towards Global-Scale Seagrass Mapping and Monitoring Using Sentinel-2 on Google Earth Engine: The Case Study of the Aegean and Ionian Seas



Earth observation for ecosystem accounting: spatially explicit national seagrass extent and carbon stock in Kenya, Tanzania, Mozambique and Madagascar

invaluable ecosystem servic Dimosthenis Traganos Avi Putri Pertiwi, Chengfa Benjamin Lee, Alina Blume, Dimitris Poursanidis,
Here, we combine the cloux Aurelie Shapiro
multispectral image archive
workflow for large-scale, hig First published: 28 June 2022 | https://doi.org/10.1002/rse2.28
be easily tuned to space,
seagrasses in an area of 4(Funding Information: The authors acknowledge WWF for fundir
Oceans Practice Innovation fund. DT and APP acknowledge Deuts
for funding and support through the Global Seagrass Watch proj
DLR-DAAD Research Fellowship (No. 57478193). DT, APP and CBL
Yvonne Fong for all the provided technical support through the C

Abstract

funding Information: The authors acknowledge WWF for fundir Oceans Practice Innovation fund. DT and APP acknowledge Deute for funding and support through the Global Seagrass Watch proj DLR-DAAD Research Fellowship (No. 57478193). DT, APP and CBL Yvonne Fong for all the provided technical support through the C Google Earth Engine program. Last but not least, the authors ack the Allen Coral Atlas project and especially the Remote Sensing R Queensland for the kind and invaluable provision of their benthing.

EXECTIONS







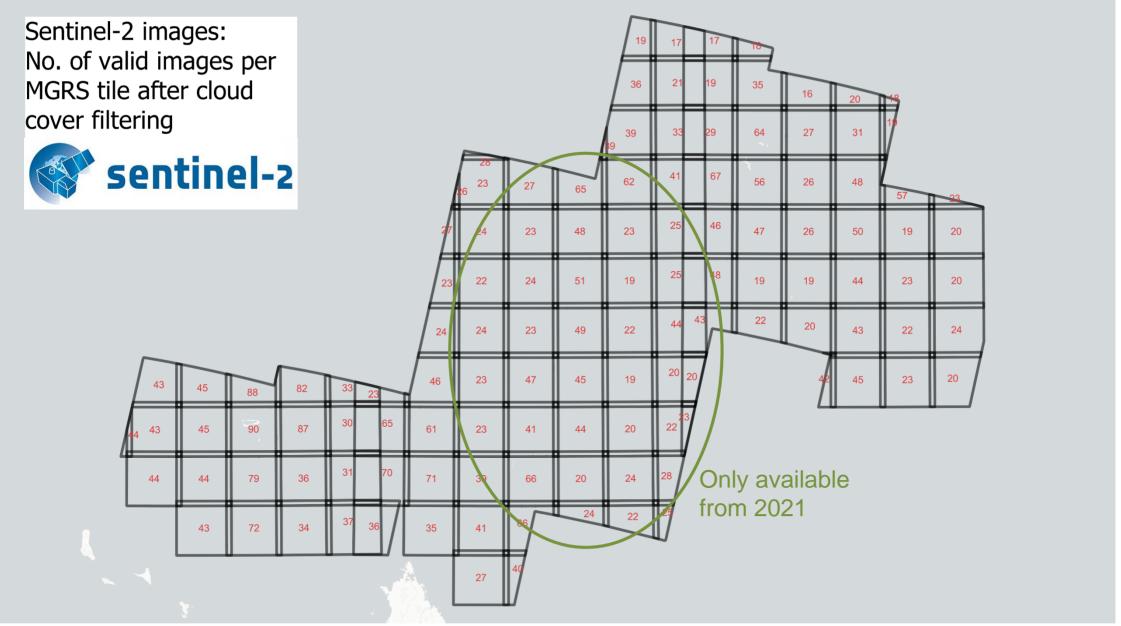
This article is part of the Research Topic

Blue Carbon: Beyond the Inventory

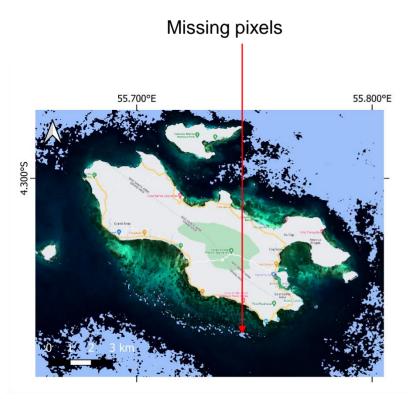


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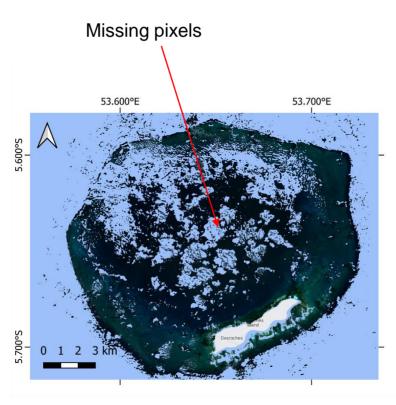
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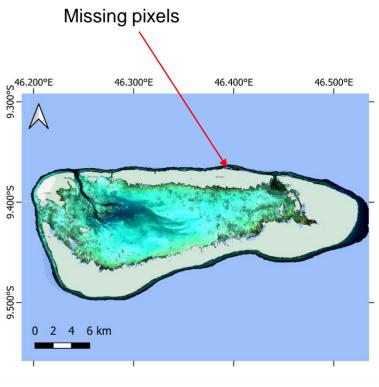




Praslin, Seychelles



Desroches, Seychelles



Aldabra, Seychelles



Are there alternatives to the Sentinel-2 Dataset on Google Earth Engine?



Analysis Ready Dataset (GEE)

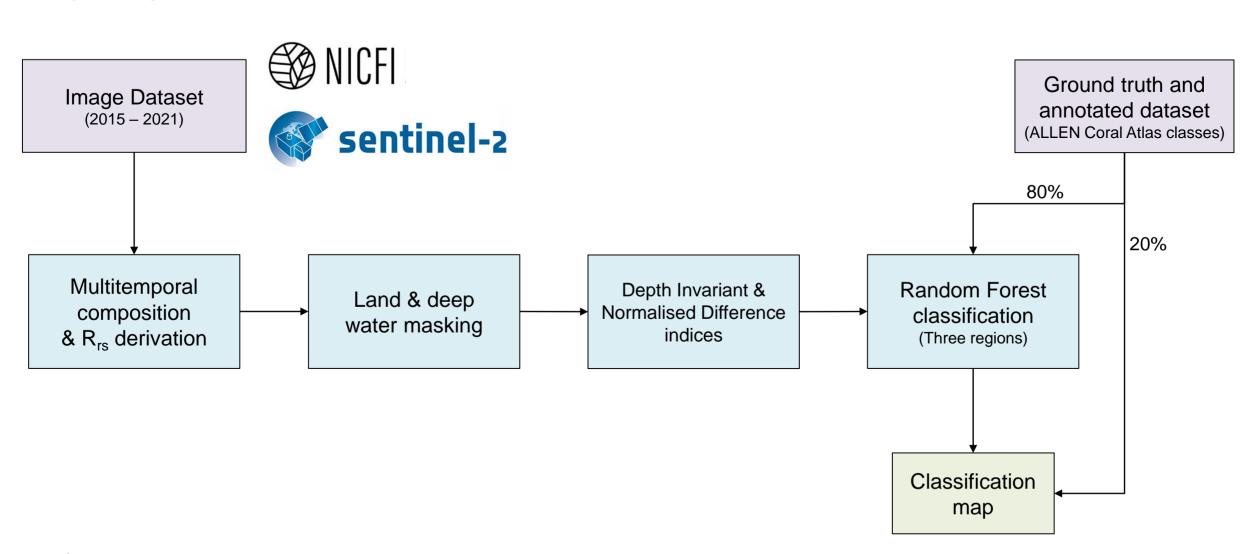
	PlanetScope NICFI	Sentinel-2
Туре	Multitemporal composites (Biannual – Dec 2015 to Jun 2020) (Monthly – Sep 2020 to present)	Single images
Spatial resolution	4.77 (5) m	10/20/60 m
Revisit cycle	30.3 hours	5 days
Spectral resolution	4 bands (R, G, B, N)	13 bands (not all are applicable for aquatic RS)
Coverage	Covered since 2015, buffered areas from coastline	Some areas are covered since 2015, others only since 2021







Work flow





Results

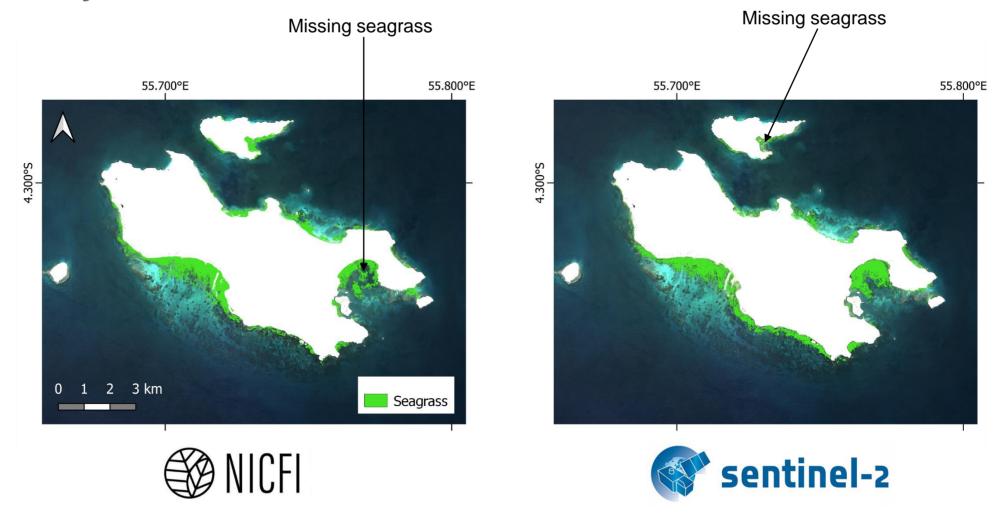




<u>North</u>		
Overall accuracy	69.7%	66.9%
PA (Seagrass)	57.2%	54.3%
UA (Seagrass)	65.9%	61.5%
Central		
Overall accuracy	64.2%	56.3%
PA (Seagrass)	80.2%	77.0%
UA (Seagrass)	70.4%	67.6%
<u>South</u>		
Overall accuracy	68.4%	64.2%
PA (Seagrass)	81.9%	79.6%
UA (Seagrass)	73.9%	73.5%

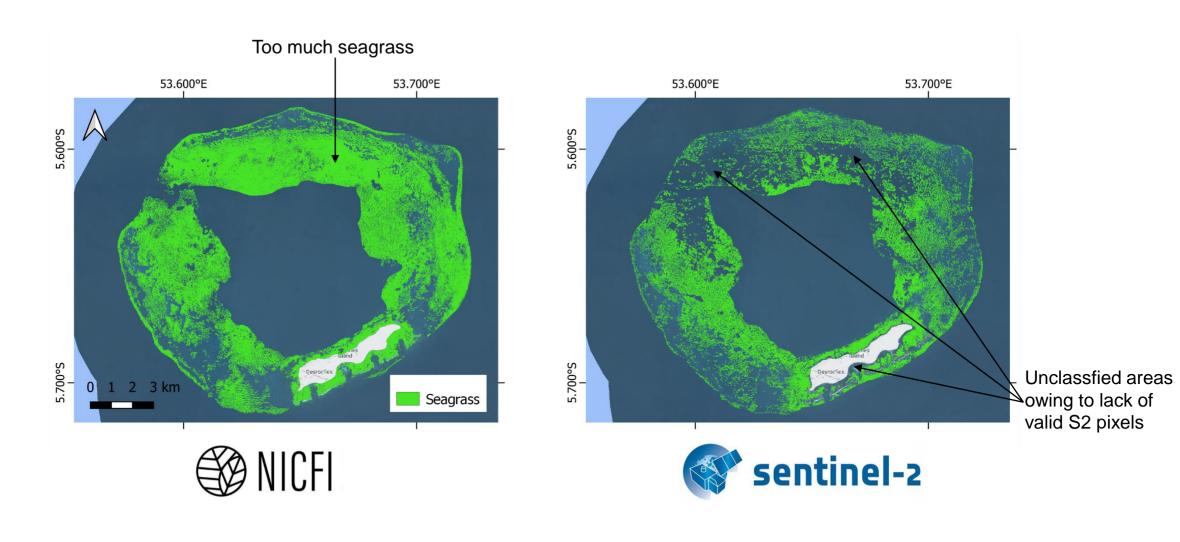


Praslin, Seychelles



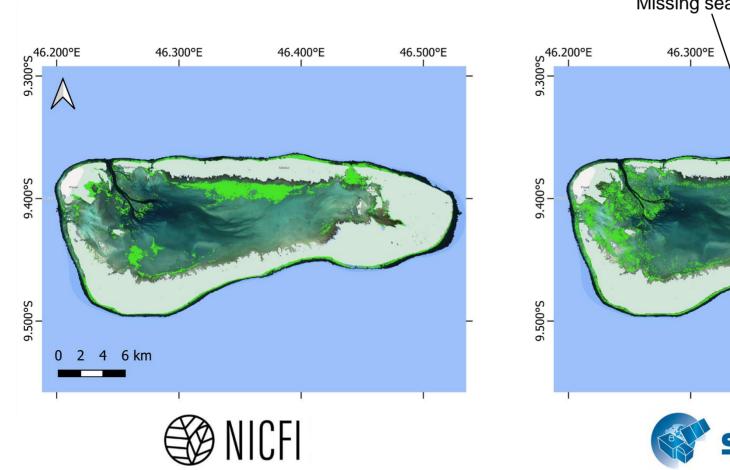


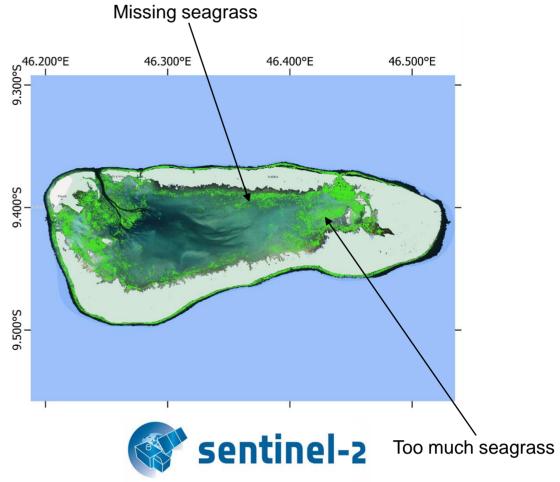
Desroches, Seychelles





Aldabra, Seychelles







Limitations





Less spectral resolution (no ultrablue)

"Single" image composites may already been heterogenous (despite normalisation using LS8)

Correction issues from the aforementioned heterogeneity

Don't forget the atmospheric correction!

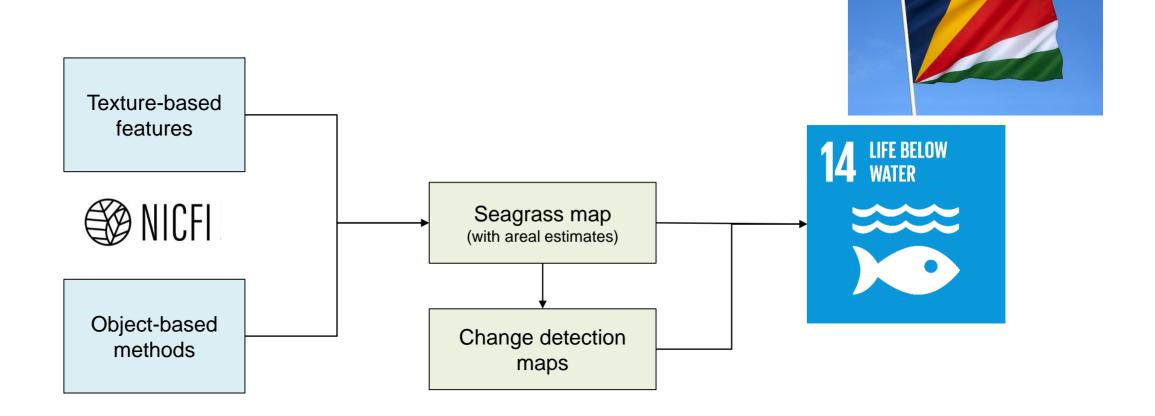
Missing pixels in the multitemporal composite

Issues with algal mat misclassification at Aldabra

Classification of deeper seagrasses still a challenge



Future steps





Conclusion

- PlanetScope NICFI is a better alternative to Sentinel-2 on GEE for Seychelles
- More work required to improve the map
- Step towards a blueprint to map seagrasses on a large scale for blue carbon and NDCs



Thank you for your attention

Any questions? Contact me at chengfa.lee@dlr.de!

