

Change detection of Lake Starnberg, Germany using NDVI and Sentinel 2

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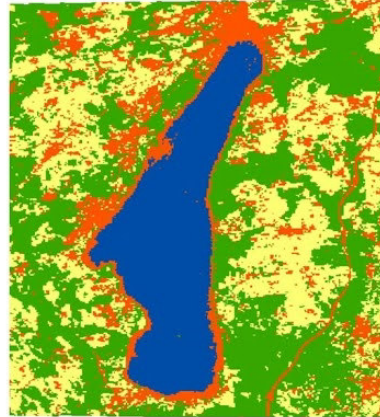
Introduction

We have conducted our research on Lake Starnberg, Germany to observe seasonal and long-term changes in land use and water surface using Sentinel 2 for the years between 2015 and 2020.

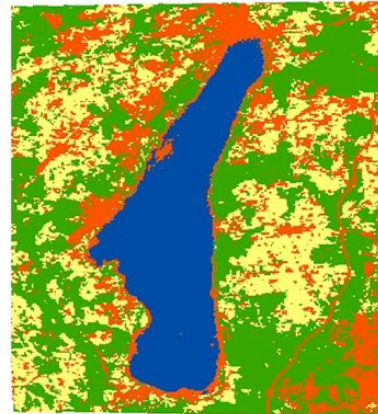
In this study, we have classified an area of 330.192 km² surrounding lake Starnberg. The methodology included the collection of satellite images, pre-processing and classifying them using the software ArcMap.

Methodology

For our study, we downloaded high resolution Sentinel 2 images for 2015 and 2020 from google earth. We used training samples to categorize into four land use classes (Water, built-up, barren and forest). For both years separately 50 training samples for each class (total 300 samples) were created with different sizes of polygons. The classification accuracy and kappa statistics were estimated



A. Classified image (2015)



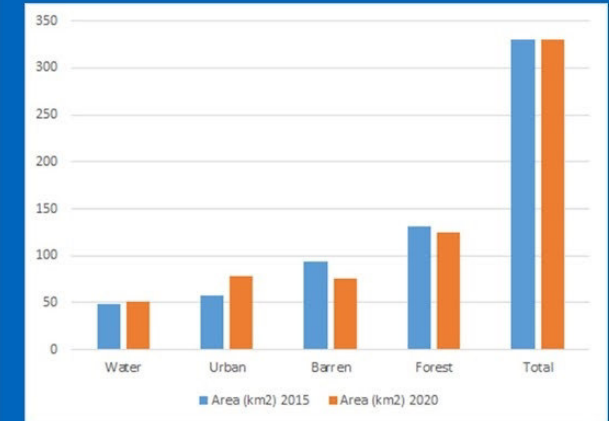
B. Classified image (2020)



C. Change detection map

Years	Overall accuracy	Kappa Coefficient
2015	91.42%	88.49%
2020	90.05%	87.56%

	2015	2020
NDVI	High 0,999487	High 0,633444
	Low -0,633444	Low -0,999487
NDWI	High 0,731174	High 0,731174
	Low -0,956040	Low -0,956044



Comparison between 2015 and 2020

Conclusion

In this study it was found that, from 2015 to 2020 approximately, 5% (7 km) of the forest has been converted to non-forest land use; such rapid degradation of forested land to urban setup and cleared for an unknown reason. There is an increased volume of water that might be for precipitation or heavy snowfall.