LAKE NAIVASHA

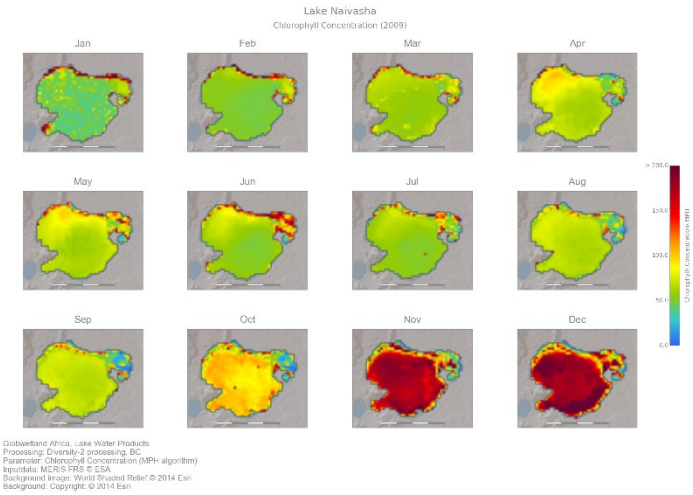
SPOTLIGHT

"Nature Kenya, international researchers and Lake Naivasha residents are extremely worried about the future of this remarkable lake."

| Fleur Ng'weno, Nature Kenya[1] |

WATER QUALITY PRODUCTS

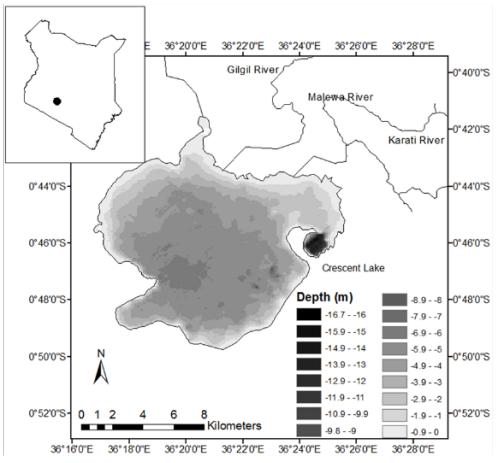
Chlorophyll-a Concentration | MPH



Description: The satellite derived monthly averages of the chlorophyll concentration of Lake Naivasha is shown for 2009 and 2010 (source: MERIS). These years show a moderate to high occurrence of algal, with an intense bloom in Nov – Feb. The water level was decreasing significantly until 2010 [2].

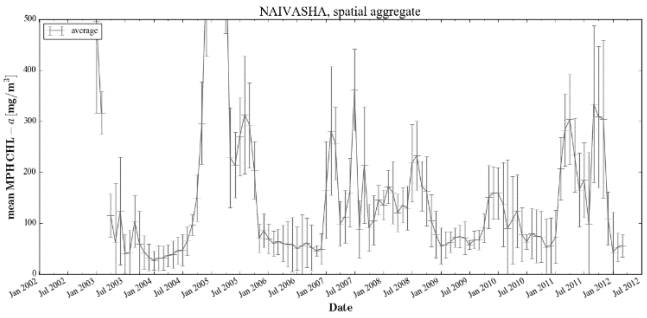
FAST FACTS

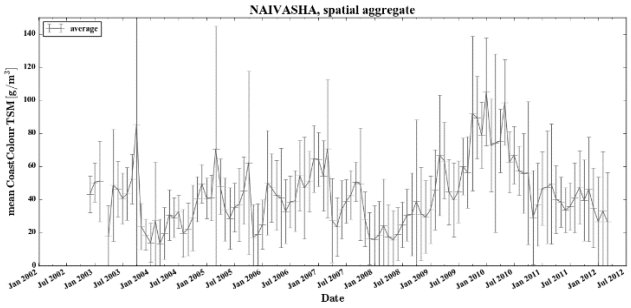
- Lake Naivasha is at the highest elevation of the Kenyan Rift valley
- Catchment covering an area of approximately 3400km² and the area of the water body is 140 to 180 km² depending on the rainfall
- Lake Naivasha has been subject to wide fluctuations of water levels over time. The name "Naivasha" derives from the Maasai "enaiposha" meaning "moving waters"
- Only the Malewa River flows permanently into the lake, while other rivers are only entering seasonally or even only periodically.
- There is no visible outflow and it is presumed that there is an underground outflow
- This natural fluctuation, combined with increasing water demand and land use change have led to occasionally strong decreases of the lake water levels.
- A strong polarisation exists, with the western portion of the basin being much more arid, deforested and eroded - and therefore less populated - than the eastern highlands
- The lake is a RAMSAR wetland despite supporting important economic activities



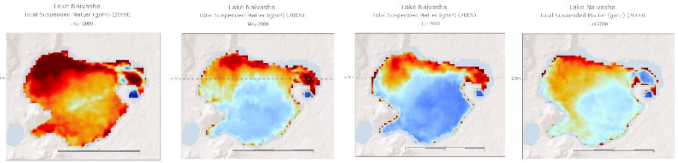
source: Ndungu et al. (2014)

Time Series of Chlorophyll Concentration | CHL

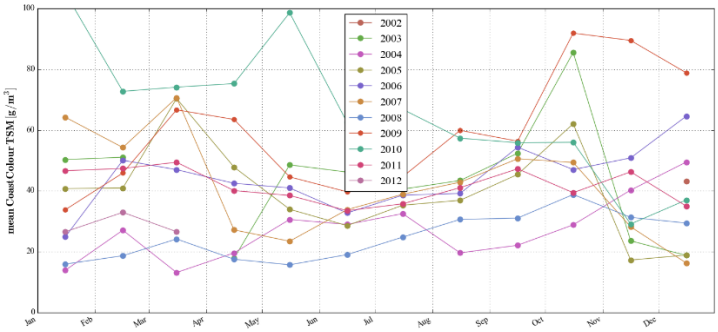




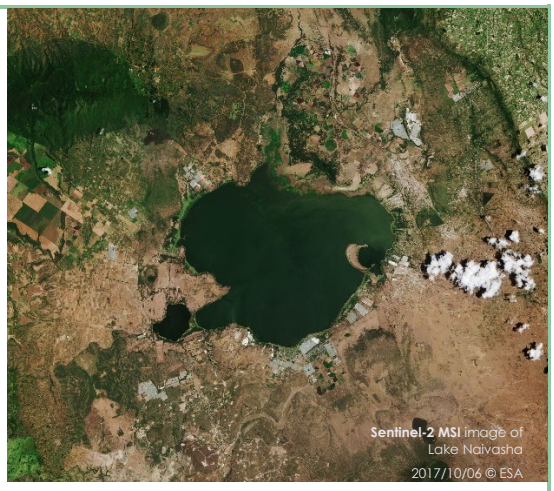
Description: The time series of the chlorophyll concentration and suspended matter (TSM) for the 10 years show that there is not a clear seasonal cycle, but rather a multi-year patterns of high and low concentrations. TSM and CHL are showing different behavior between the years for both parameters. While an extreme high algal bloom occurred in 2005/2006, the concentration of TSM was moderate. The TSM in 2010 increased significantly from 2008 to 2010, while decreasing between 2010 and 2011. The chlorophyll concentration during this period was low to moderate compared to other years.



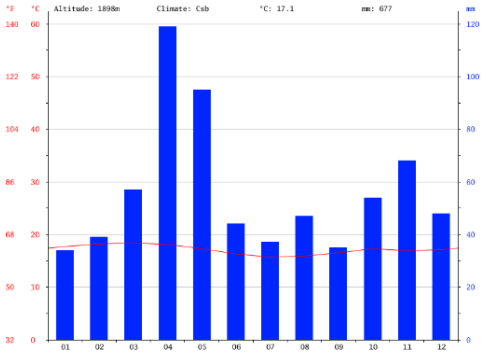
Description: The four maps of the suspended sediment concentration show the influence of the rivers that are entering Lake Naivasha in the North of the lake. The river plumes have different concentrations and sometimes the influence is only in the North (e.g. in July 2009) while disseminated into the full lake in other times (e.g. April 2009)



Description: The stacked yearly time series of suspended matter concentration show that there is a general trend with higher concentration in Mar-Apr and Oct-Nov but showing also differences between the years in terms of concentration level and distribution.



Sentinel-2 MSI RGB image showing the water body of Lake Naivasha.



The graph shows the average rainfall per month [4]. However, the rainfall patterns may vary between different years because they are generated by processes that are related to changes in the temperature of the Oceans and to the direction of the winds [3].

References

[1] Lis Bernhard (2017): Putting the Spotlight on Lake Naivasha this World Water Day; https://www.unenvironment.org/news-and-stories/story/putting-spotlight-lake-naivasha-world-water-day

[2] Odongo, V.O et al. (2014): Coupling socio-economic factors and eco-hydrological processes using a cascade-modeling approach. J. Hydrol. (2014), http://dx.doi.org/10.1016/j.jhydrol.2014.01.012

[3] http://www.naivasha.info/path/

[4] https://en.climate-data.org/location/11126/

[5] Ndungu, J.N. et al. (2015): Analysis of the Driving Force of Hydrodynamics in Lake Naivasha, Kenya. Open Journal of Modern Hydrology,05,95-104. doi: 10.4236/ojmh.2015.54009

All satellite derived products shown here have been derived from MERIS sensor onboard of ENVISAT. The product development and processing have been performed within the ESA projects Diversity-2 and Globwetland-Africa.

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