21st National Rangeland Forum

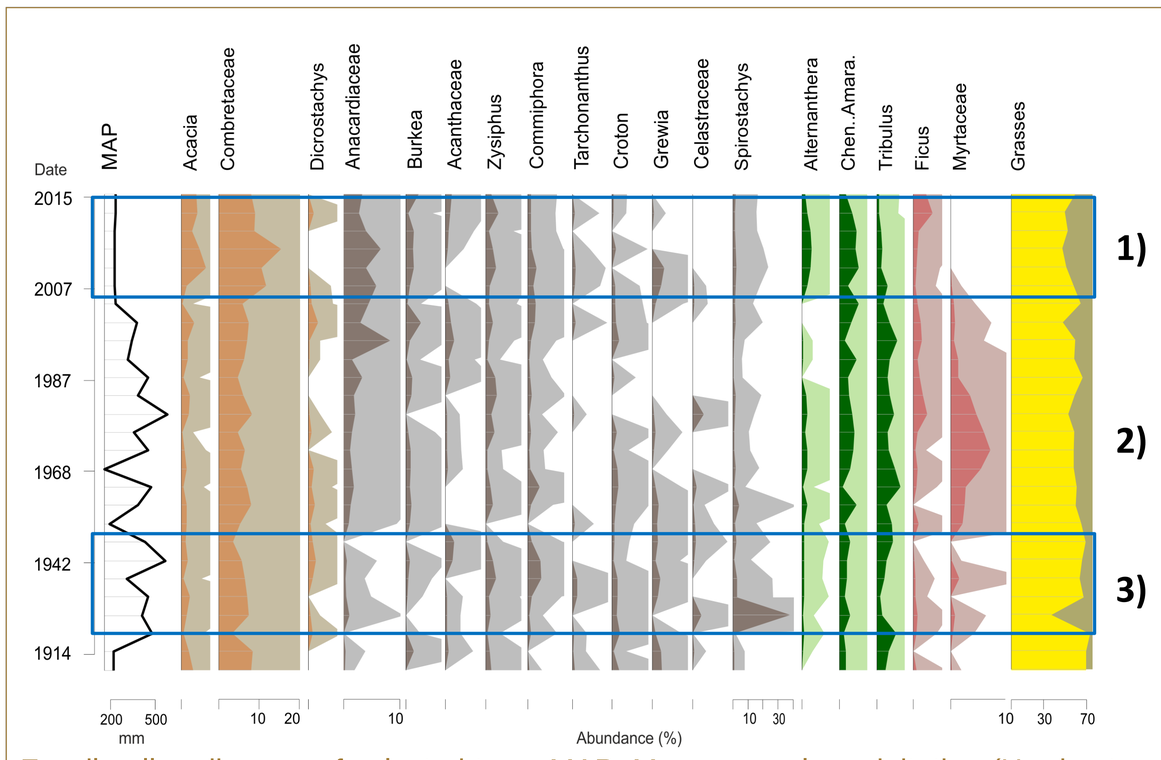
Otjiwarongo, Namibia,
17.-19. July 2017

OPTIMASS

Fossil pollen reconstruction of vegetation history at Ojikoto Lake in the last century

Objective: Pollen based reconstruction of past vegetation composition since 1914 at the Otjikoto region.

Methods: Several sediment cores were collected from Otjikoto lake. Pollen and chemical analysis were performed on 30 sediment samples of core 15oj10 (30 cm).



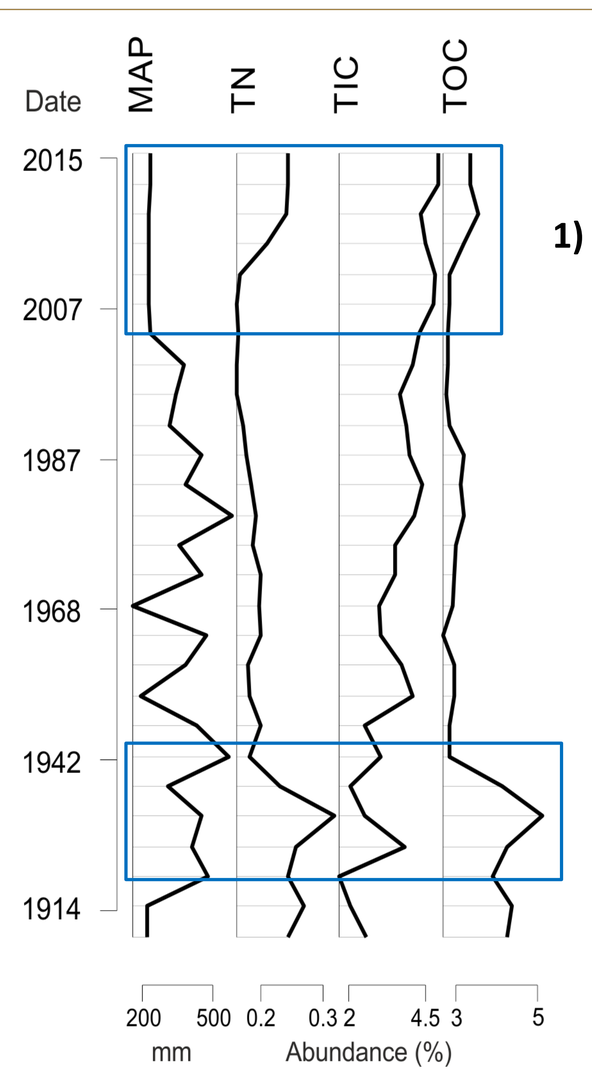
Fossil pollen diagram of selected taxa. MAP: Mean annual precipitation (Harris et al, 2014). Shadow curves correspond to 10x exageration.

Fossil pollen reflect vegetation change during the last 100 years

1) Encroachment during the last 10 years is reflected by an increase of pollen percentages of *Acacia, Combretacea* (*Terminalia*) and *Alternanthera* (disturbance indicator). Decreases of grasses and *Tribulus* suggest sparse ground cover.
2) Shoreline vegetation displays **taxa turnover** from *Myrtaceae* to *Ficus* at drier conditions.
3) Broad-leaved taxa such as *Spirostachys* and *Commiphora* seemingly benefited from continued high precipitation during the thirties.

Chemical sediment composition reflect water dynamics at Otjikoto Lake

1) Increase of total inorganic carbon and decreasing precipitation during the last 10 years reflect **low water recharge** at Otjikoto lake.
2) High levels of total nitrogen and total organic carbon suggest additional **nutrient input** and high lake productivity in the thirties.
3) A peak of total inorganic carbon and continued high precipitation suggest increased **runoff**.



Chemical composition of sediments from Orjikoto lake. MAP: Mean annual precipitation (Harris et al, 2014); N: Total nitrogen; TIC: Total inorganic carbon; TOC: Total organic carbon.

Key messages

- Fossil pollen reflect **vegetation change** following fluctuations in the **precipitation.**
- Fossil pollen reflect **encroachment** within the last 10 years.
- Chemical sediment composition reflect **low water recharge** at Otjikoto lake during the last 10 years.

Pollen and chemical sediment analysis are suitable to reconstruct vegetation history and environmental conditions of savannahs.

References

- Harris, I. et al., 2014. Updated high-resolution grids of monthly climatic observations - the CRU TS3.10 Dataset. International Journal of Climatology, 34(3), pp.623–642.

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