COST ES1104 Desert Restoration Hub

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STSM title: Identifying shallow groundwater resources in deserts

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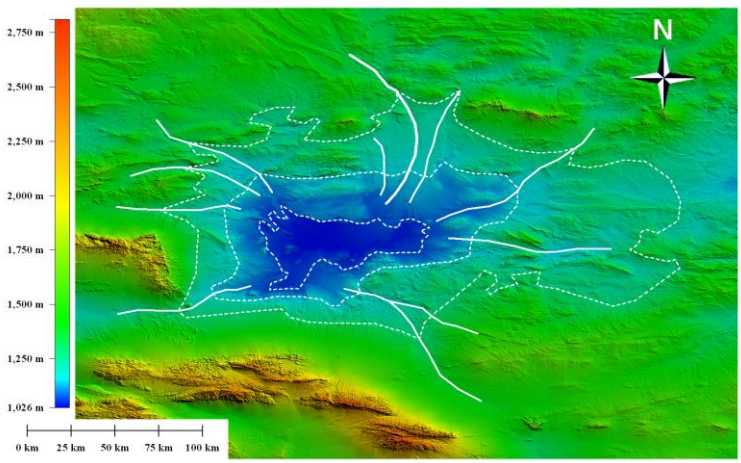
Five Keywords: shallow groundwater, remote sensing, water mega-projects, water mapping, palaeo water features

Topic summary: Research investigated the effectiveness of present water development scenarios (megaprojects) in drylands and the future potential of an original remote sensing technique for identifying sub-surface water channels in deserts. The twinned approach combines the appeal of prospective water discovery with the reality of how water resources are developed for drylands. Work evaluated how enhancement of water resources in deserts contributes to sustainable land use and ecosystem rehabilitation. Methods can be applied across global drylands.

Methods summary: Our investigation employed the latest imaging and techniques, including much improved topographical data (higher resolution), and the use of longer wavelength L-Band radar-enhanced data, to identify water palaeofeatures at Ulaan Nuur Lake, Mongolia. We conducted the analysis of present-day topography provided by Shuttle Radar Topography Mission (SRTM) data and coupled this with Advanced Land Observing Satellite (ALOS)/Phased Array type L-band Synthetic Aperture Radar (PALSAR) radar imaging, which delivered additional information related to surface and subsurface features.

Results and implications for restoration: The result mapped geomorphological structures related to past water resources (palaeolakes and palaeochannels) at Ulaan Nuur Lake, Mongolia suggestive of present aquifers. Work exemplified how new methods can identify shallow groundwater sources in drylands for social and ecosystem benefit. As potential new water resources they can increase community rehabilitation and restoration.

Relevant web links:
www.sciencedirect.com/science/article/pii/ S0140196315000567
www.tandfonline.com/doi/abs/10.1080/07900627.2015.1012660



Example of using satellite imagery to identify past (palaeo) water features in a desert landscape. Solid lines identify former river channels; dotted lines are former lake beds. Palaeoshorelines and features are also evident. Fieldwork confirmed validity of remote sensing work.