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Determination of potential groundwater discharge zones into a Salt Lake using remote sensing techniques and in-situ measurements

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Groundwater and surface water are integral components of the hydrologic system with strong feedback mechanisms and hence should be treated as a single resource. Existence of groundwater discharge into lakes is a very significant factor that affects both the water quantity of the lake as well as its ecological and biological diversity. The degree of interaction is more significant for shallow lakes because of their increased vulnerability due to limited volume and rapid changes in the extent and duration of the wet/dry cycles. The Salt Lake, located in Central Anatolia, Turkey, is a hyper-saline, shallow lake that is ranked as the second largest lake in Turkey. The majority of the lake dries during the late summer season enabling investigation of the lake bottom morphology. Through analysis of the high-resolution satellite images we identified circular features that may indicate possible groundwater seepage locations. The density and shape properties of these features were then investigated via spatial statistics to identify possible trends that can be linked to controlling mechanism(s) such as underlying sediments, geology, hydrogeology and wind patterns. The analysis was supported by field measurement of salt thickness at various locations in a systematic way. Long-term precipitation, lake level and groundwater level data were compared to investigate possible relationships and trends. In this presentation the framework to investigate remotely-sensed and in-situ measurements will be discussed with potential links to the groundwater recharge to the Salt Lake. Future work will focus on installing long-term monitoring networks in the lake.