From sea level changes to land-atmosphere interactions

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While the ice sheets and mountain glaciers continue melting, changes in climate over the past decade have led to Earth's continents to store extra water in land (over soils, lakes and underground aquifers), temporarily lowering the rate of sea level rise by about 20% called “climate-driven sea level changes”. Such changes in land water storage, in fact, affect the land-atmosphere interactions, especially over several “hot spots” globally, including Australia. The high spatial and temporal variability in soil water storage over Australia plays an essential role in affecting the variability of land-surface coupling strength. While previous studies focused more on the spatial variations of land-atmosphere interaction and resulting hotspots, in this study, we attempt to explore temporal changes of the land-surface coupling strength in the semi-arid regions. Furthermore, recent advances in satellite measurement of time-variable gravity (GRACE data (Launched in 2002, NASA's Gravity Recovery and Climate Experiment)) indicate the agricultural irrigation’s fingerprint in land water storage variation that will also be covered in this talk, and discuss how irrigation can largely affect the land-atmosphere interactions and thus, the local and regional hydroloclimatology.

Key words: Sea Level Changes, GRACE, Water Storage, Land-Atmosphere Interactions.