

## **The role of big-data in agriculture to assess and model crop yield and environmental impacts.**

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Recent extreme weather events provide a preview of future challenges for agricultural systems across the world due to increasing climate variability. Growing irrigation demand, significant declines in groundwater levels across the High Plains, and inefficient use of fertilizers that can lead to nitrate leaching into the groundwater, greenhouse gas emission, and pollution of surface water are threats to agricultural systems and the ecosystems that depend on them. Given the complexity of modern farming practices, a system approach, using quantitative process-based model that account for the interaction between weather-soil-genotypes and crop management to evaluate their impact on production and environmental outcomes, is mandatory. Big data hold tremendous values, but until they are properly analyzed, their impact in agriculture remains limited. We are now at a critical point to promote the adoption and utilization of precision technologies due to new developments in big data through yield mapping and advancement in the spatial, spectral and temporal resolutions of remote sensing data and platforms (new satellites, increasing sophistication of UAVs, new airborne remote sensing companies), and with improved crop modeling. The seminar will describe the latest advancement in remote sensing imagery linked with crop modeling and weather forecasts to enable growers to implement spatially variable management across the field to increase profit and reduce environmental impact.