Customizing NASA's Earth Science Research Products for addressing MENA Water Challenges

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As projected by IPCC 2007 report, by the end of this century the Middle East North Africa (MENA) region is projected to experience an increase of 3°C to 5°C rise in mean temperatures and a 20% decline in precipitation. This poses a serious problem for this geographic zone especially when majority of the hydrological consumption is for the agriculture sector and the remaining amount is for domestic consumption. In late 2011, the World Bank, USAID and NASA have joined hands to establishing integrated, modern, up to date NASA developed capabilities for various countries in the MENA region for addressing water resource issues and adapting to climate change impacts for improved decision making for societal benefits. The main focus of this undertaking is to address the most pressing societal issues which can be modeled and solved by utilizing NASA Earth Science remote sensing data products and hydrological models. The remote sensing data from space is one of the best ways to study such complex issues and further feed into the decision support systems. NASA's fleet of Earth Observing satellites offer a great vantage point from space to look at the globe and provide vital signs necessary to maintain healthy and sustainable ecosystem. NASA has over fifteen satellites and thirty instruments operating on these space borne platforms and generating over 2000 different science products on a daily basis. Some of these products are soil moisture, global precipitation, aerosols, cloud cover, normalized difference vegetation index, land cover/use, ocean altimetry, ocean salinity, sea surface winds, sea surface temperature, ozone and atmospheric gasses, ice and snow measurements, and many more. All of the data products, models and research results are distributed via the Internet freely through out the world. This project will utilize several NASA models such as global Land Data Assimilation System (LDAS) to generate hydrological states and fluxes in near real time. These LDAS products will then be further compared with other NASA satellite observations (MODIS, VIIRS, TRMM, etc.) and other discrete models to compare and optimize evapotranspiration, soil moisture and crop irrigation, drought assessment and water balance. The floods being a critical disaster in many of the MENA countries, NASA's global flood mapping and modeling framework (CREST) will be customized for country specific needs and delivered to the remote sensing organizations for their future use. Training is an important component under this activity and adequate level of training will be offered to build basic capacity to work with NASA provided data products, models for their future use. This paper provides a comprehensive introduction to NASA's Earth Science mission for understanding the behavior of our home Planet, projecting its health for future generations and applying research results solving societal issues.