



EXPLORE EARTH

YOUR HOME, OUR MISSION

Earth Information System (EIS)

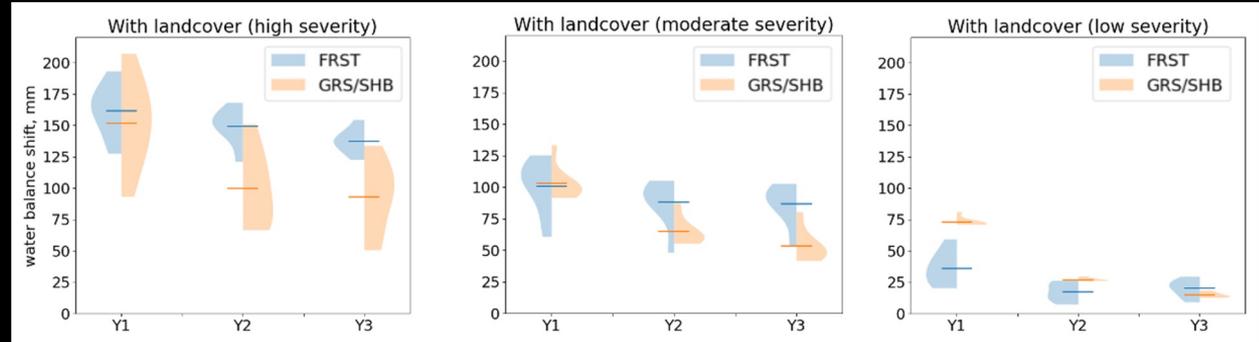
Monthly Highlights

June 2023

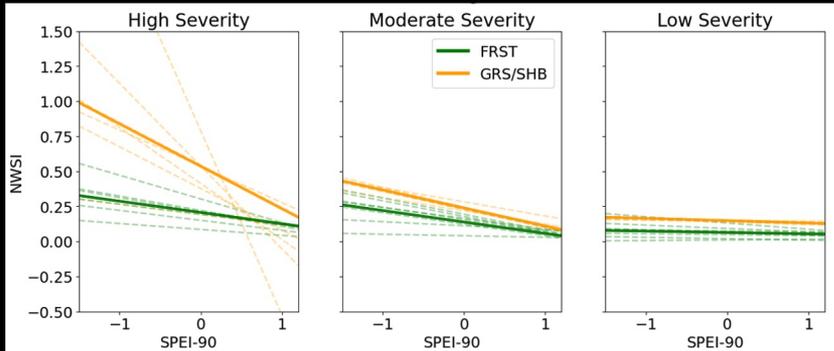


Droughts in Western US slow post-fire water balance recovery

ET observations from OpenET allowed the EIS Water Security and Fire teams to explore hydrology and vegetation response to 1500 fires in the Western US as a function of drought stress, landcover, and burn severity.



Water balance shift (Precipitation minus ET) caused by fire events of high to low severity during 2016-18 in forested (FRST) and non-forested (grasslands: GRS, and shrublands: SHB) landscapes of Western U/S. Spread is shown across seven landcover products, with whiskers showing the means.



Relationship between precipitation-normalized water balance suppression (NWSI; y-axis) and drought (x-axis) for forested (FRST) and non-forested (grasslands: GRS, and shrublands: SHB) landscapes. Dotted lines represent spread across seven landcover products, with solid line showing the median.

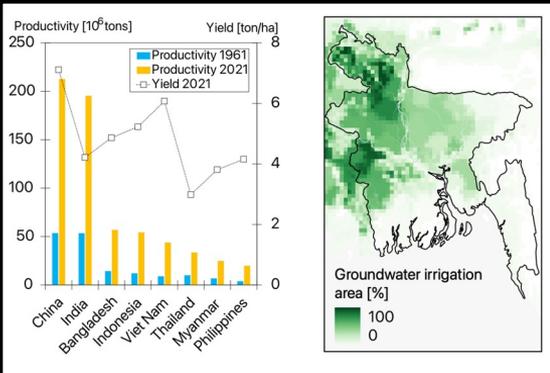
Grasslands and shrublands in high burn severity fires are most sensitive to droughts where severe droughts suppress ET more and slow post-fire recovery. Forests are least impacted in low burn severity fires, but recover slowest in high burn severity fires.

This work provides understanding of the coupling between the land surface and atmosphere in the post-fire environment and will have downstream impacts of water management in the Western US.

Intensive Irrigation Depletes Aquifers in Bangladesh

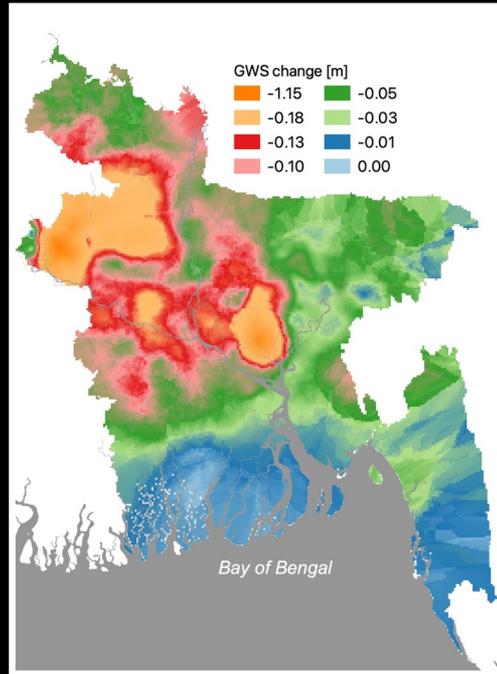
EIS engagement with Bangladeshi stakeholders granted access to ground observations at ~1200 boreholes.

NASA datasets and Machine Learning approaches allowed the reconstruction of spatiotemporal groundwater variability across the country over the past 40 years.



Left panel: Rice productivity of the world's top ten producers in 1961 and 2021, and corresponding yield - Bangladesh ranks third, only behind China and India.

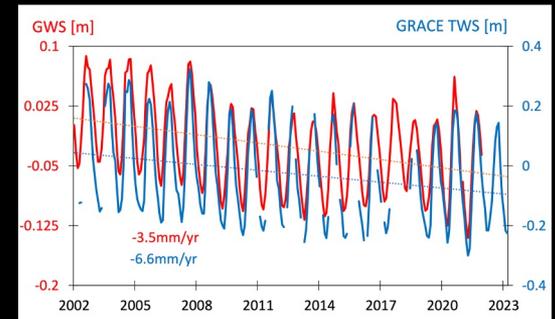
Right panel: Groundwater irrigation in % across Bangladesh. Data was derived from Digital Global Map of Irrigation Areas (GMIA), corresponding to the 2000-2008 period.



Groundwater storage (GWS) loss across Bangladesh. The map shows water column change from an early pre-development period to a late intensive irrigation period.

Bangladesh has witnessed a substantial increase of irrigated rice production in the past decades that, combined with domestic water use, resulted in a groundwater loss of 11km³ countrywide.

Using NASA models and datasets, ongoing EIS efforts aim at quantifying the compounding effects of human activities and climate change on the regional water cycle and flood risk.



Countrywide reconstructed groundwater storage (GWS) and GRACE-based terrestrial water storage (TWS).

EIS Retreat

The EIS community came together for the first team-wide EIS retreat on June 7, 2023 held at Goddard Space Flight Center. About 60+ team members from across the NASA centers and our University partners, who work directly for EIS, participated in the meeting.



We had presentations on the past, present and future goals of EIS, an overview of EIS data science and an overview of each of the EIS thematic area projects followed by the breakout sessions to brainstorm ideas and processes on synthesis across science thematic areas and analyze our strengths, weaknesses, opportunities and threats in the following topics - open science, cyberinfrastructure, earth system science, applications and stakeholder engagement. Here is a link to the [EIS Retreat Presentations](#).

New EIS Website is launched!

The new EIS website hosted on earthdata.nasa.gov went live on June 6, 2023.

Link to the website:

<https://www.earthdata.nasa.gov/eis>

Connect and engage with us!



Open-source science discussions on [GitHub](#)



EIS Discoveries on VEDA [Dashboard](#)



EIS Engagements in June

Organization/ Meeting	Thematic Area	Outcome
NASA GSFC SED Seminar (hybrid) on June 1	All thematic areas	“In-reach” to Goddard 600 community to increase awareness about EIS, answer questions, and discuss opportunities for increased cross-center coordination/ collaboration.
EIS Water Quality Model and DA Updates with U Texas Arlington and Kingsville	Water Security and Agriculture & Crops	Discussed strategy for expanded CONUS work to global, training on model, and broadening stakeholder engagement.
EIS team and Bangladesh Water Development Board	Water Security	Acquisition of countrywide groundwater data for multiple EIS applications, including Bangladesh groundwater depletion mapping and monitoring, and model calibration and evaluation.