A Robust Application of Google Earth Engine For Estimating Surface Suspended Sediment Concentration (SSSC) Dynamics in Mekong Delta

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Background

- Water from the upstream rivers, streams, and lakes within the Greater Mekong basin transport suspended sediment to the delta
- This sediment does not only play an important role to the ecological and agricultural livelihood of millions of people in the delta, but also contributes to the geomorphologic change and water quality of lower Mekong River
- Over the last decade, the rapid economic development, changes in land use pattern, and dam constructions in the basin have significantly influenced the amount of suspended sediment depositing on the delta⁴

Suspend Sediment Measurement

The DSMP measures discharge and suspended sediment concentration (SSC) at 17 sites along the mainstream Mekong, the delta, the Tonle Sap River, and the Sekong River.



For Illustrative only



Remote Sensing of Suspend Sediment









The estimation of SSSC is based on the empirical model developed by Markert et al. (2018)





Storage and Compute

Google Earth Engine



code.earthengine.google.com

Method

- Retrieve surface reflece of Landsat 8 image collections
- Performed cloud masking, and Dynamic Surface Water Extent, used and river central line to delineated river from other surface water.
- Apply Markert et al. (2018) algorithm on the reflectance of river to estimate the suspended sediment
- Developed an app for illustrating the suspend sediment and data export.

Developed App



Mekong Delta SSSC Explore

The estimation of SSSC is based on the empirical model developed by Markert et al. (2018)

To use this tool, give inputs to the date range (yyyy-mm-dd) from 2013 to the present, and click on the Compute SSSC button.

Use the cursor and click on the sediment layer in order to show the timeseries graph of the sediment. Click on the top right icon of the graph to make it bigger, and to save the graph as SVG, PNG and CSV.

To disable the satellite imagery and shade relief layer, go to the Layers on the top right of the map and unselect that layer .

| 2015-01-01 | |
|------------|--------------------------|
| 2015-02-28 | |
| | > 300 mg/L |
| | |
| | 2015-01-01 2015-02-28 |