Wetland Extent Tool (WET)

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The Wetland Extent Tool (WET) was developed by the Great Lakes Water Resources Team to increase the efficiency of wetland mapping in Minnesota. WET is an automated tool hosted on Google Earth Engine (GEE) that maps wetland change and extent using Sentinel-1 C-SAR backscatter ratios, Landsat 8 (OLI) indices, and a LiDAR derived Topographic Wetness Index (TWI).

Getting Started

This document provides instructions on how to acess the GEE API and deploy our tool. Our code editor can be accessed here.

Prerequisites

WET was created for use within Google Earth Engine, an open source cloud computing platform, and was scripted in JavaScript. The GEE API can be accesed on the homepage, where users can sign up and request approval. Resources for getting started and navigating the platform can be found in the GEE user guide

Inputs

Dataset	Source	Parameter	Resolution
Landsat 8 (OLI)	GEE	TCWGD, MNDWI	30m
Sentinel-1 C-SAR	GEE	VV, VH	10m
DEM (LiDAR)	Steve Kloiber	TWI	3m
Field Data	Steve Kloiber		

Deployment

Classification Scheme

Classified maps can be inspected using GEEâ€ s inspector tool on the right panel. The â€ Classified Clustersâ€ layer will return an indexed number indiciating which landcover class the pixel belongs to.

Level-1 Classification	Code Key	Description
Upland	1	Dry land
Open Water	2	Includes rivers, lakes, ponds
Wetland	3	Inundated Area

Outputs

By default, the variable â€ Classified Clusersâ€ will contain the classified map for the date range that is specified, which by default is the growing season of 2017. Users can alter the date range in lines 11 and 12 of the code to create other classification outputs. We recommend only selecting dates within Northern Minnesotaâ€ s growing season of 05/21 to 09/26, to avoid using imagery with snow.

Computation

If the region of interest is too large, the computation may time out on Google Earth Engine. To avoid this issue, users may instead export the output to their Google Drive. A function for doing this can be found in lines 981 to 988.

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