

Validation of NOAA Satellite Vegetation Phenology

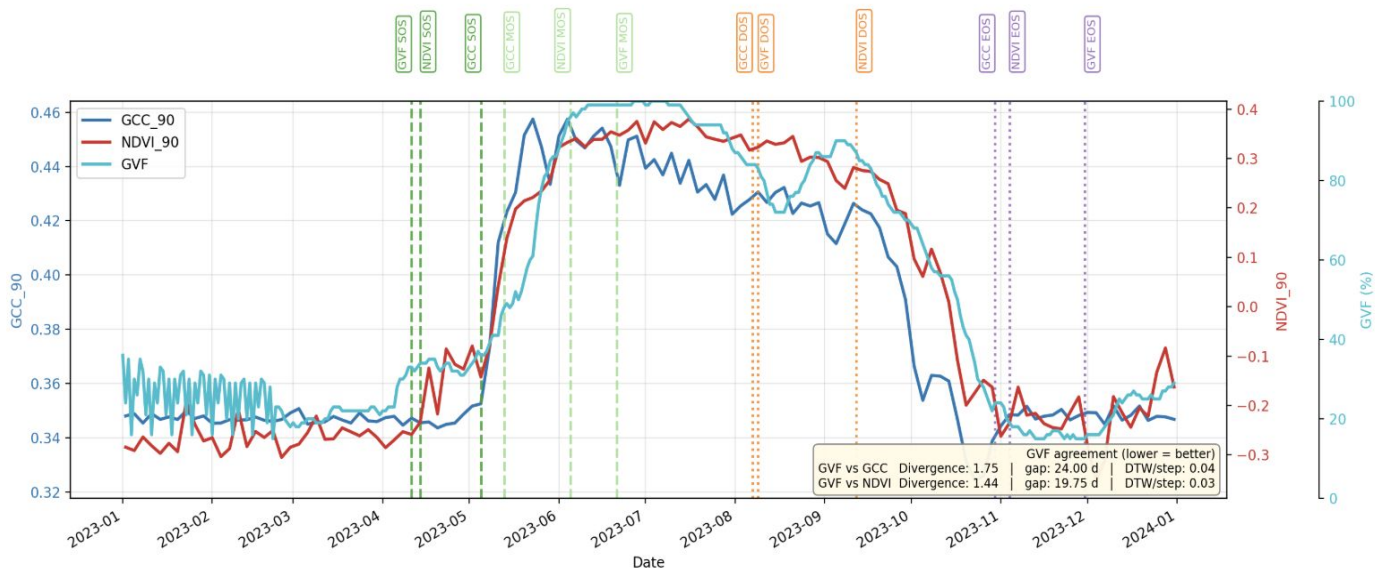
Kathy Chen

Mentor: Dr. Corinne Carter

Important Terms

- SOS: start of season
- MOS: Maturity of season
- DOS: Decline of season
- EOS: End of season
- GCC: Green Chromatic Coordinate
- NDVI: Normalized Difference Vegetation Index
- GVF: Green Vegetation Fractions

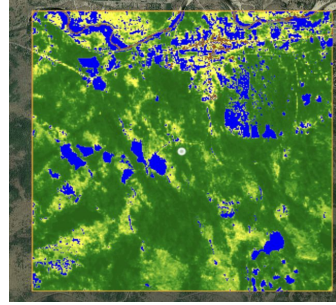
Satellite GVF vs PhenoCam GCC_90 & NDVI_90 (NEON.D01.BART.DP1.00033_DB_1000, 2023)



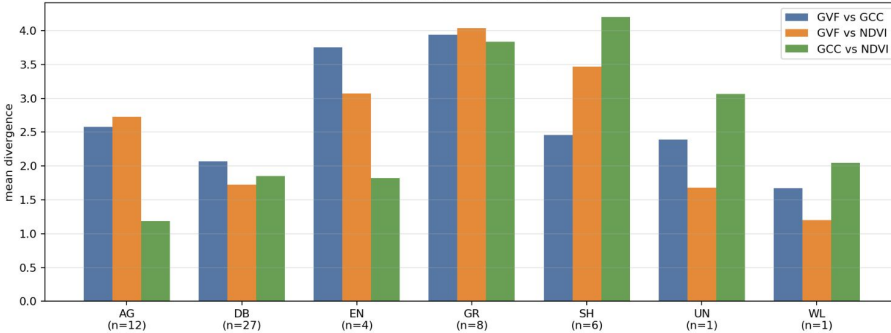
Thresholds:

- NDVI CV < 0.2
- Water fraction < 10%
- Non-Vegetated fraction (Urban + Bare Soil) < 10%

Example of passing site:

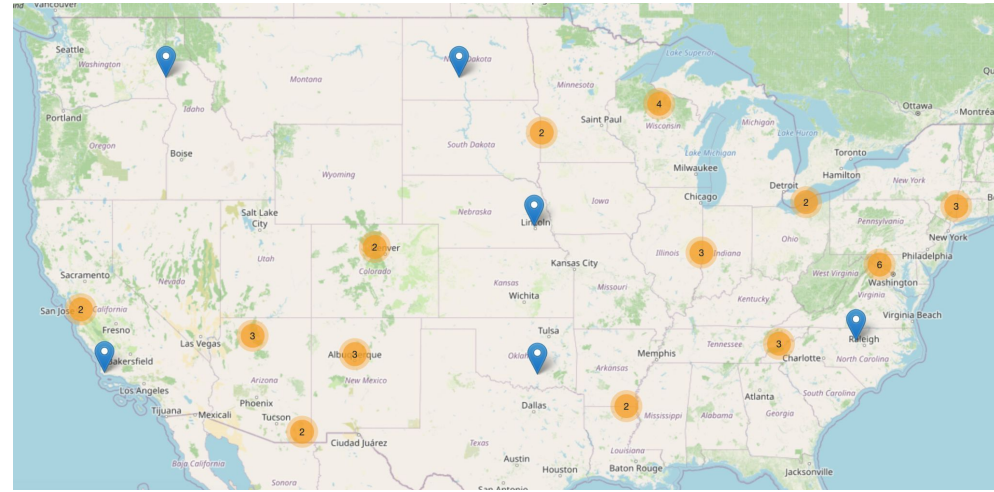


Mean pairwise divergence by veg (all sources)



Objectives

- Find all the uniform site from ground truth data
- Find inconsistency between satellite vegetation phenology and ground truth



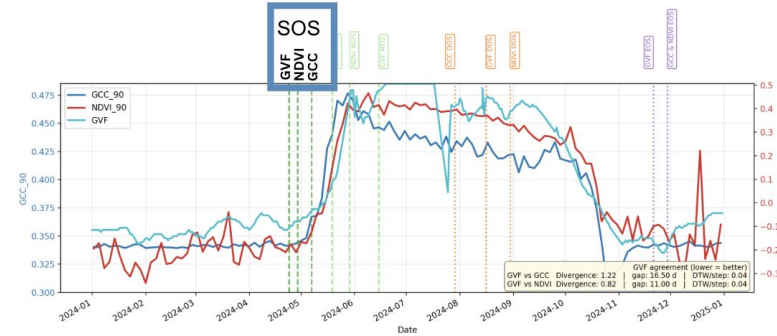
Findings

- In shrublands and grasslands, the satellite's transition dates lag roughly three weeks behind the ground cameras, even under perfect conditions.

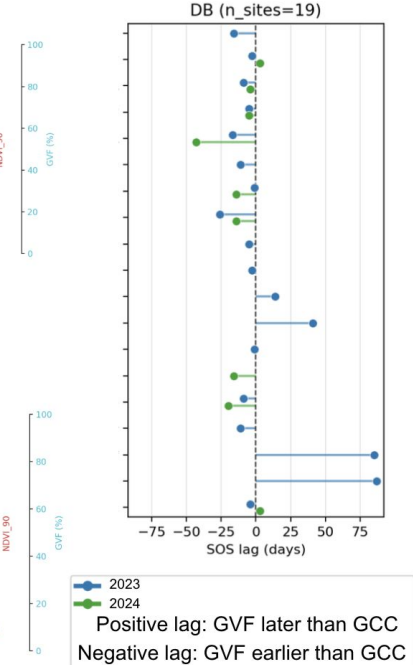
Findings

- For all the sites for deciduous forest the GVF data is stretched compared to the GCC data (see the lollipop graph on the left: positive value for stretching indications)

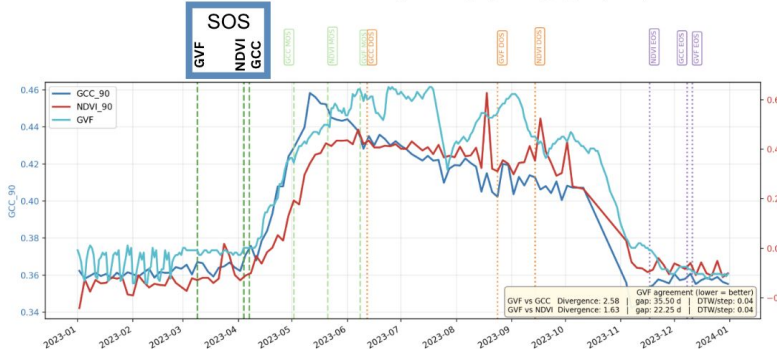
Satellite GVF vs PhenoCam GCC_90 & NDVI_90 (NEON.D01.HARV.DP1.000333_DB_1000, 2024)



GoldenSites — Phase lag 2023 (blue) vs 2024 (green)



Satellite GVF vs PhenoCam GCC_90 & NDVI_90 (coweeta_DB_2000, 2023)



DB (n_sites=19)

