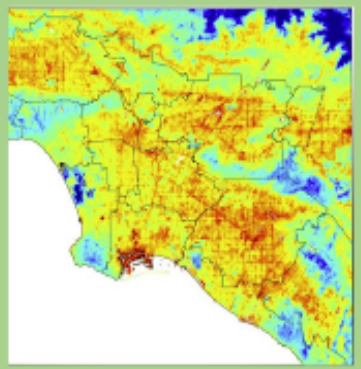
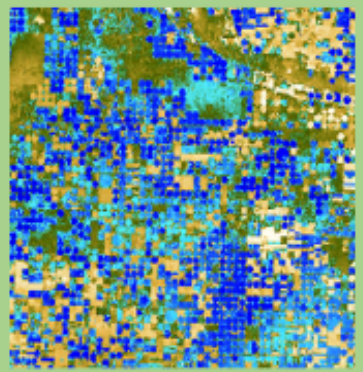
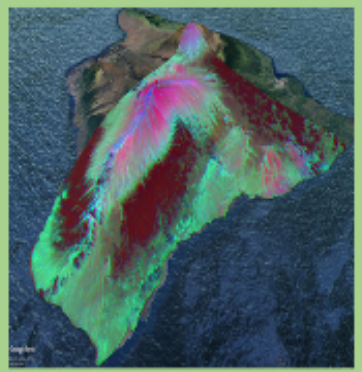
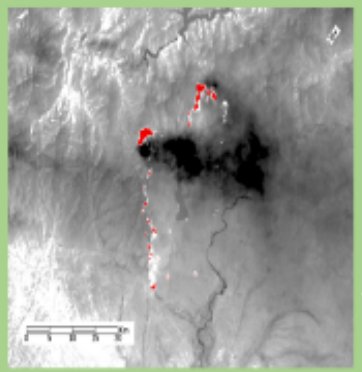
# SCIENCE

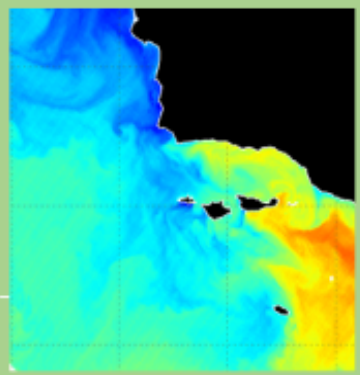
Jet Propulsion Laboratory
California Institute of Technology


Urban


Ecosystems


Volcanoes


Wildfires


Water

## ECOSTRESS: Diurnal ET

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Jet Propulsion Laboratory, California Institute of Technology

February, 2020

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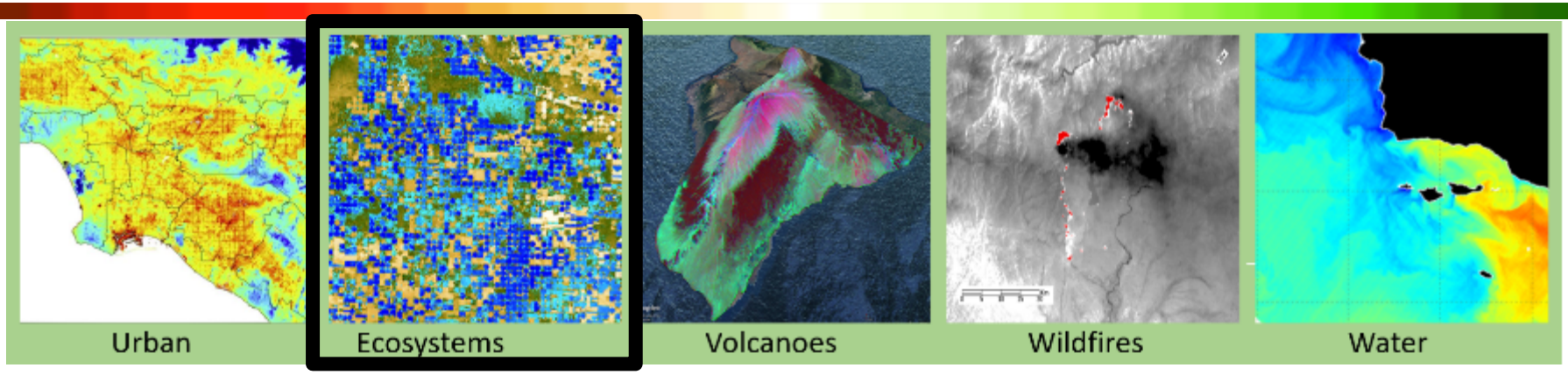
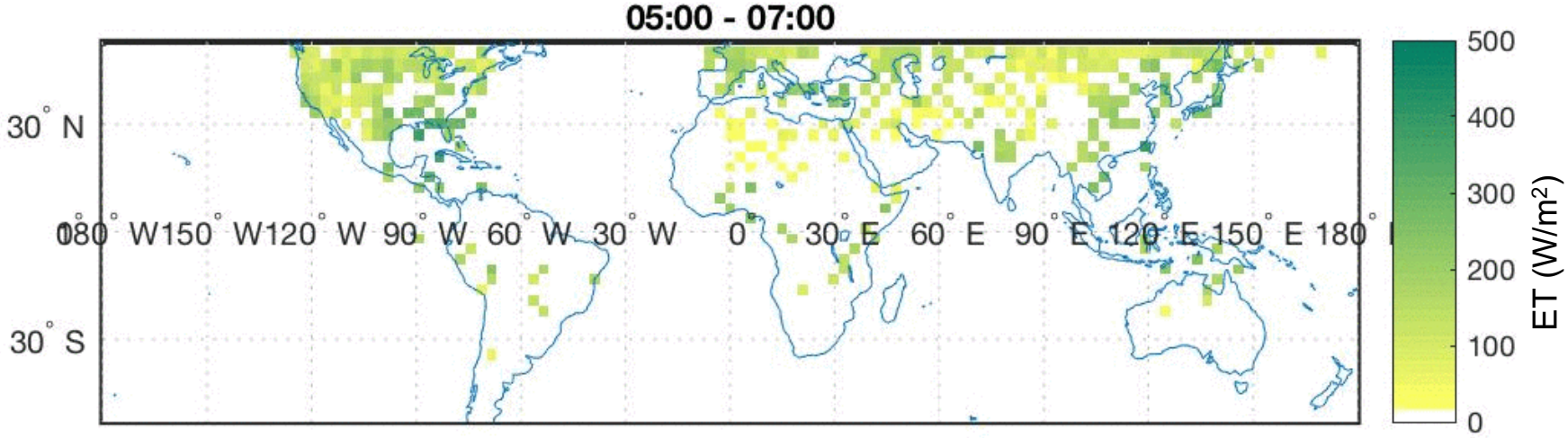
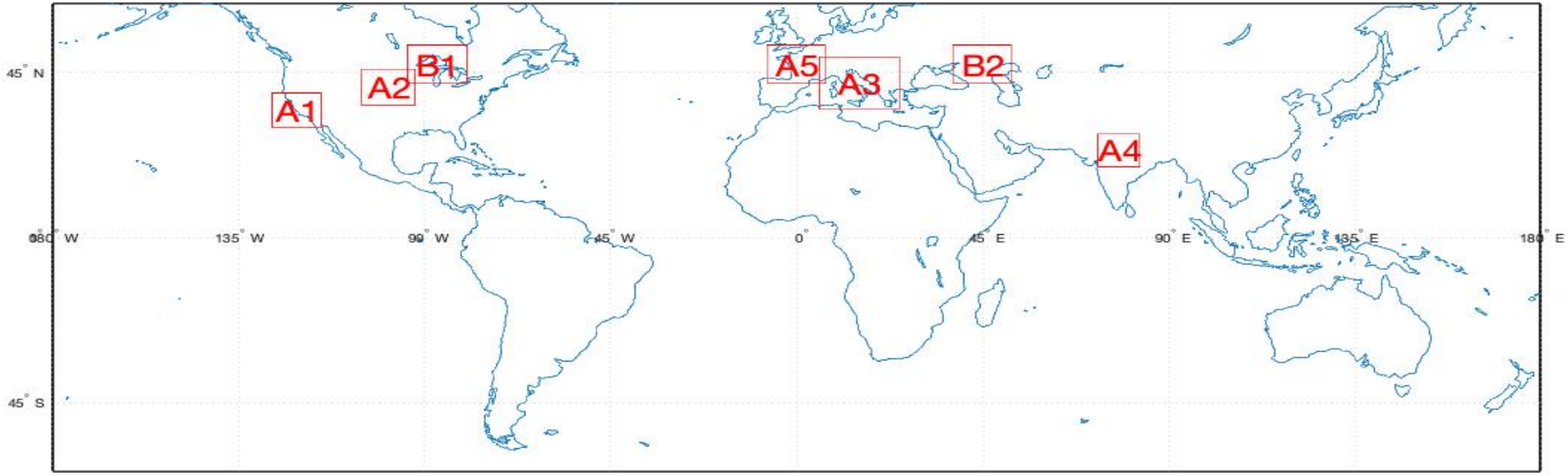
# ECOSTRESS Diurnal ET




Average evapotranspiration at local time for June – August, 2019.

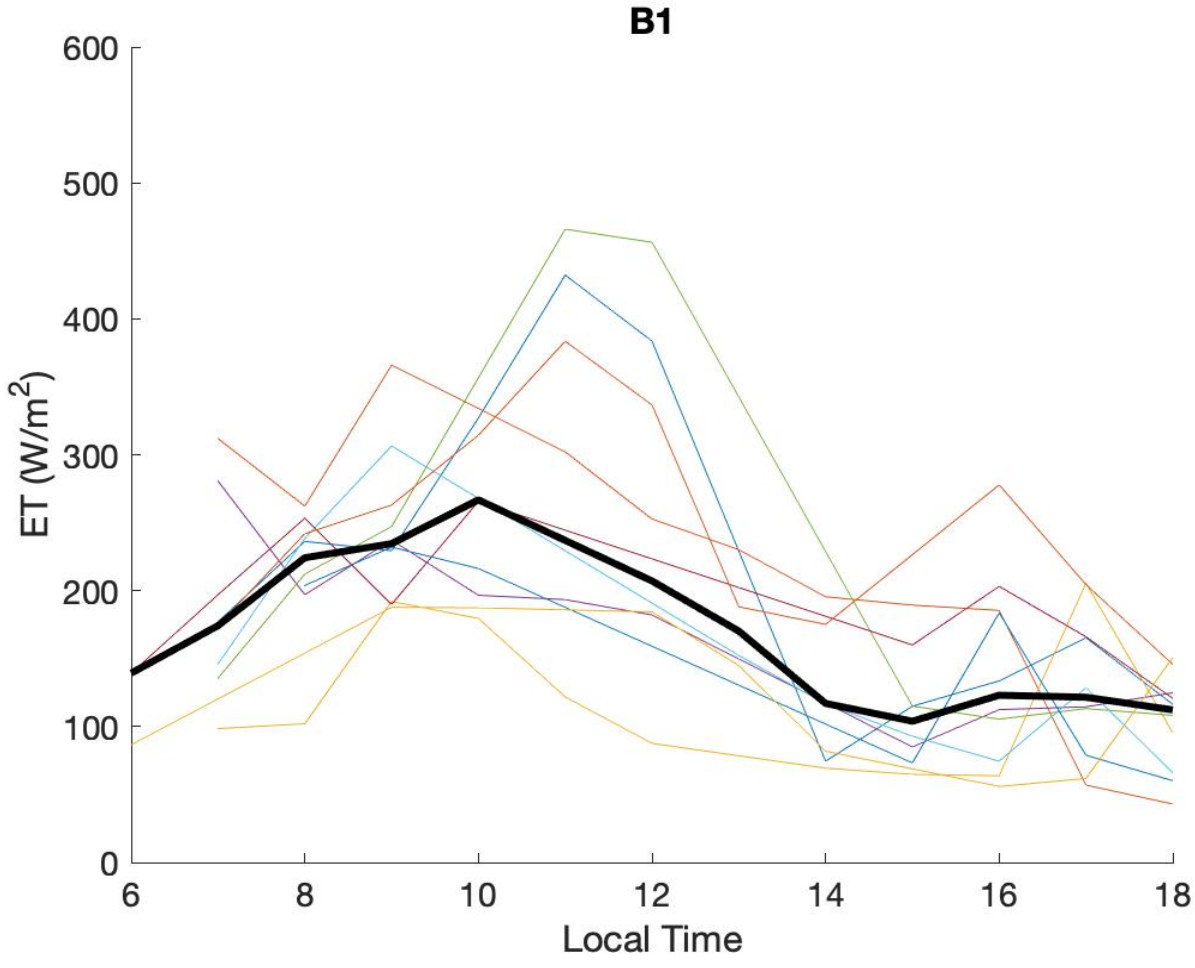
# Target sites



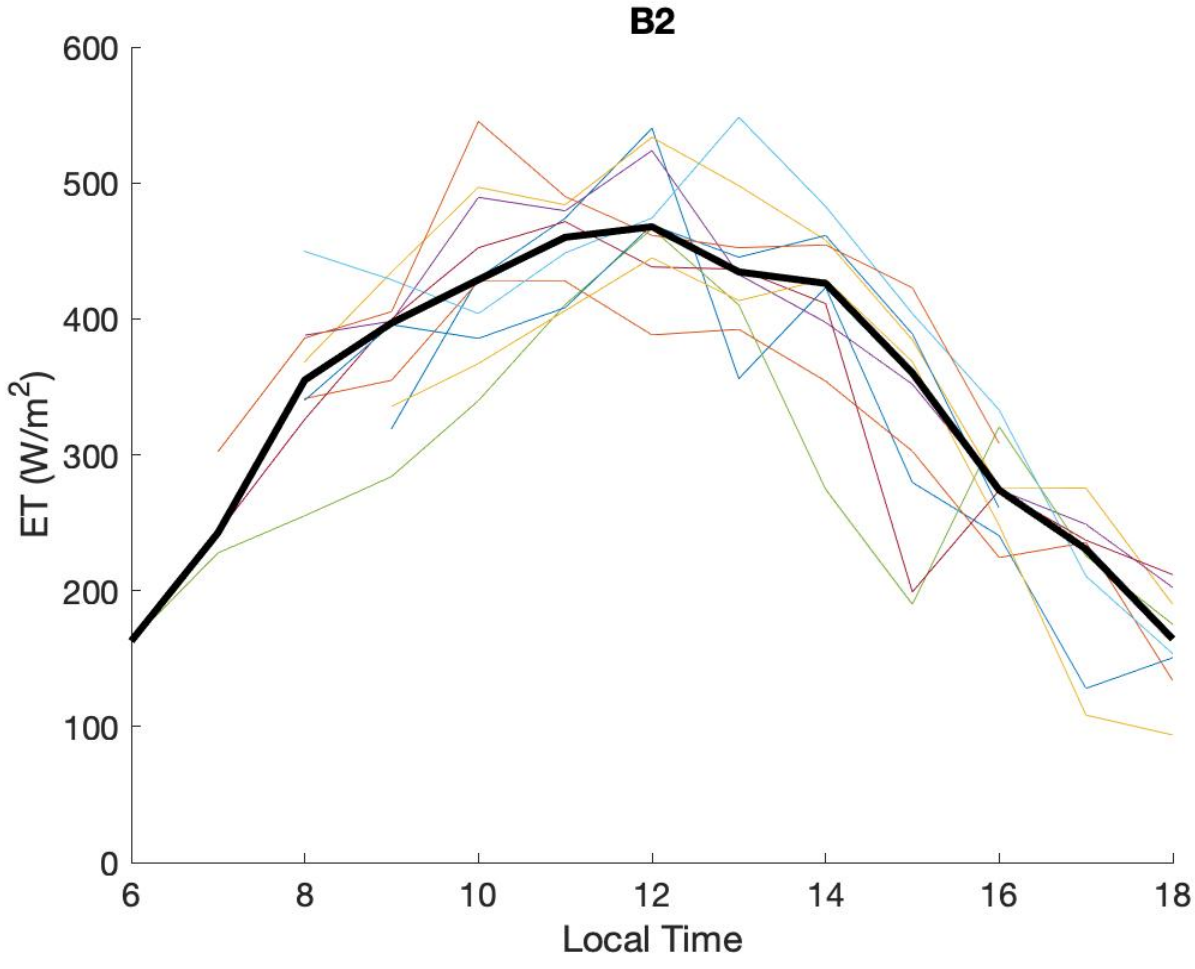
# Steps

- Use MODIS landcover classification to select 10 points per site
  - Forest class for boreal sites
  - Croplands class for agricultural sites
- Use AppEEARS to select all ECOSTRESS observations over target pixels
  - June, July, August 2019
- Resample onto an hourly grid
- Use median interpolated values as a representative sample for each target site

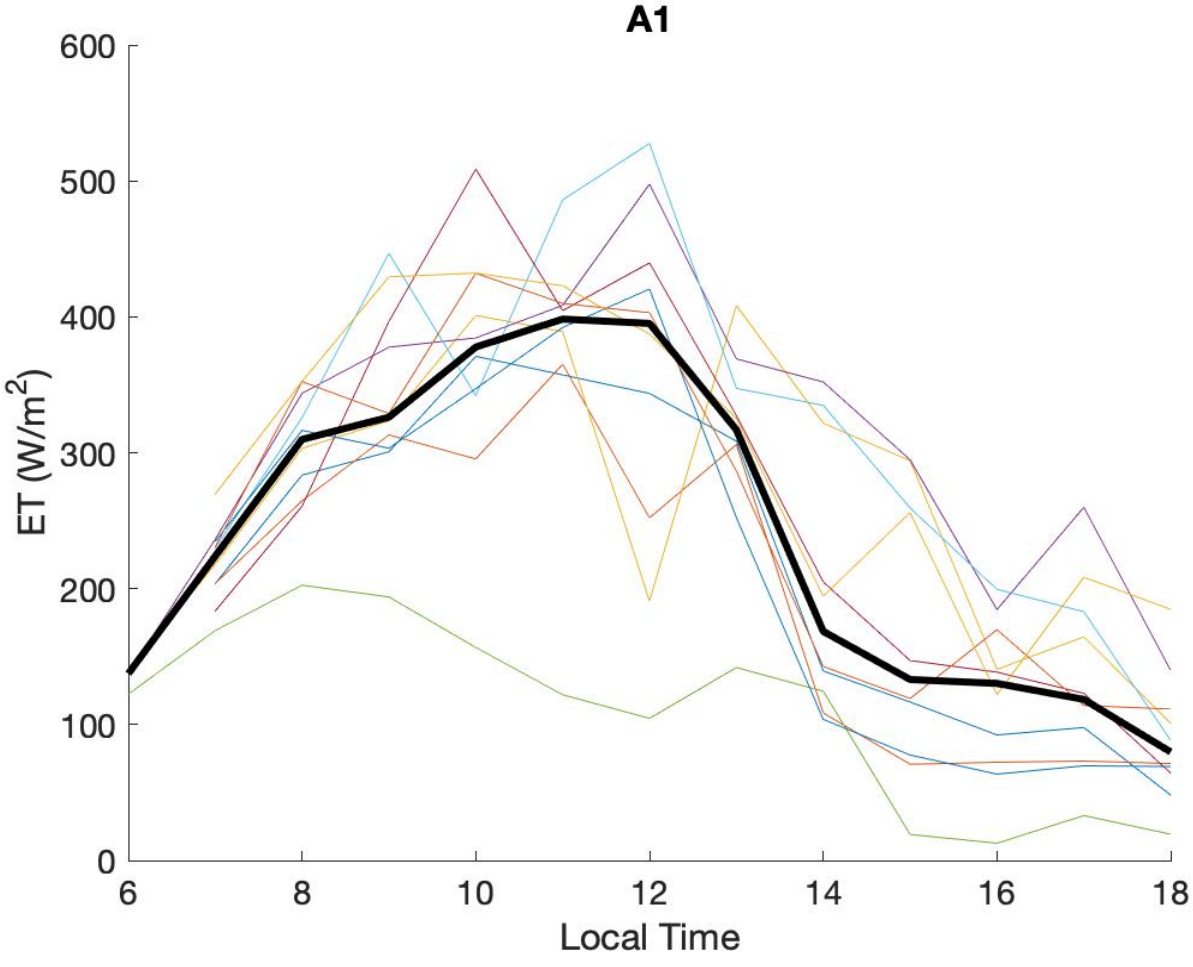
# Boreal forest diurnal ET



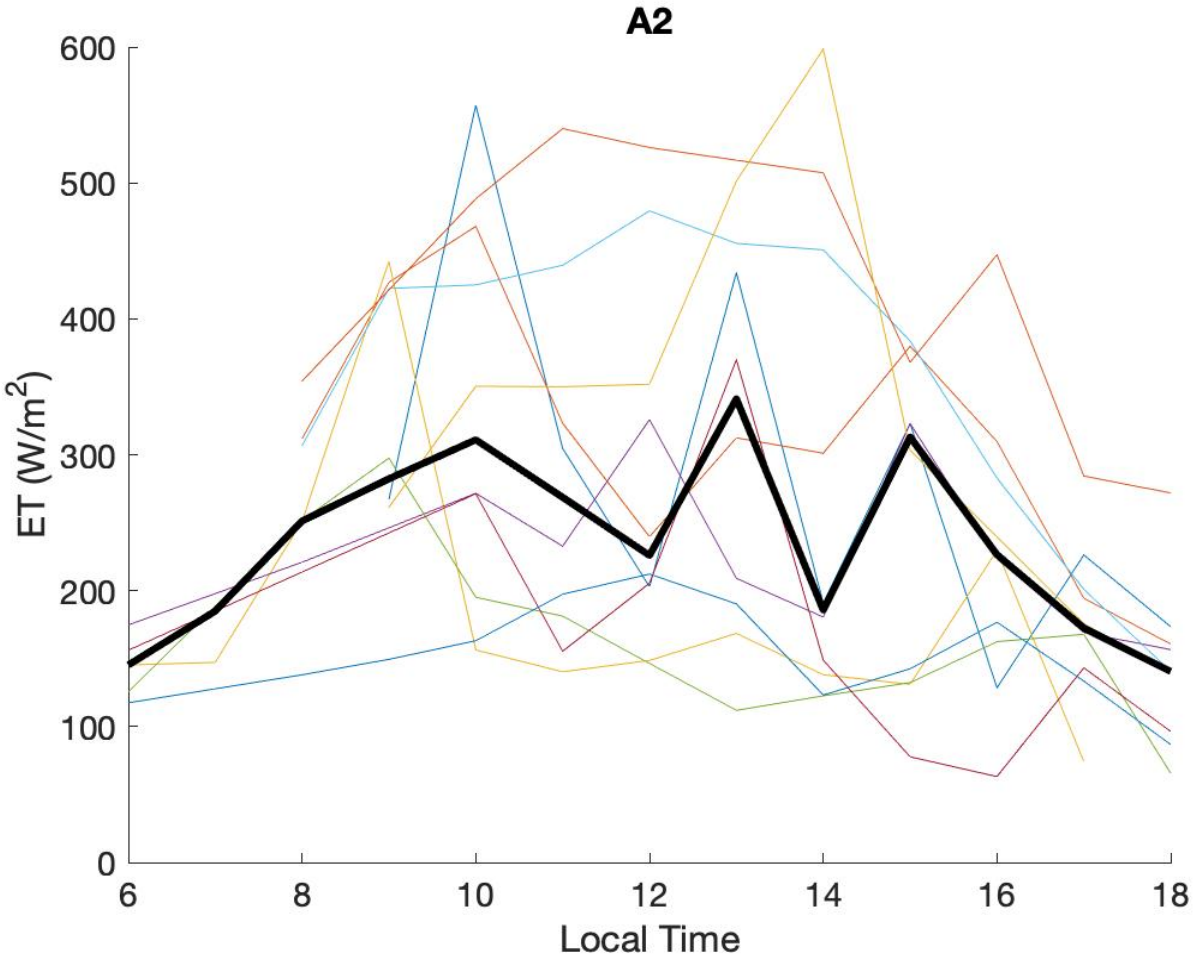
# Boreal Forest diurnal ET



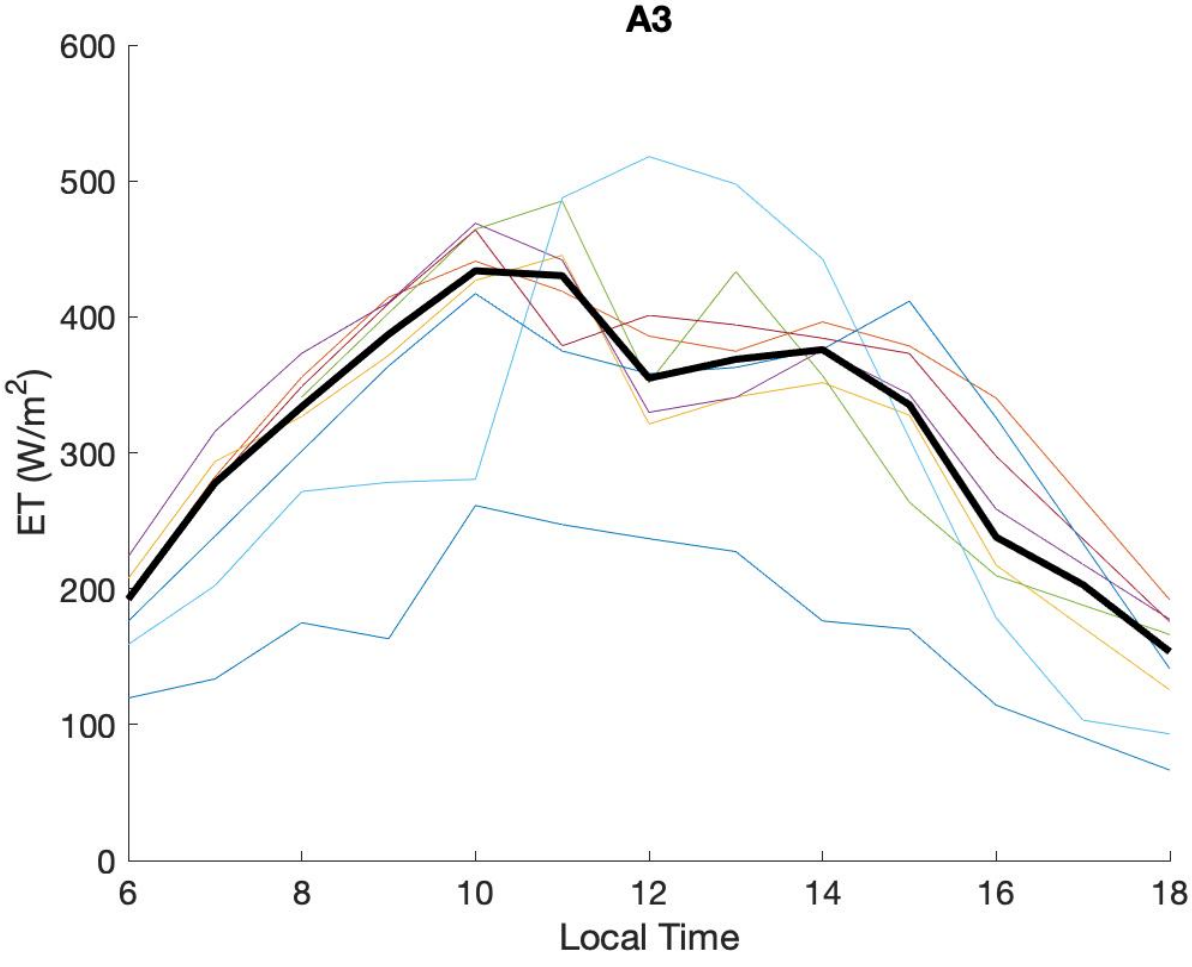
# Agricultural diurnal ET



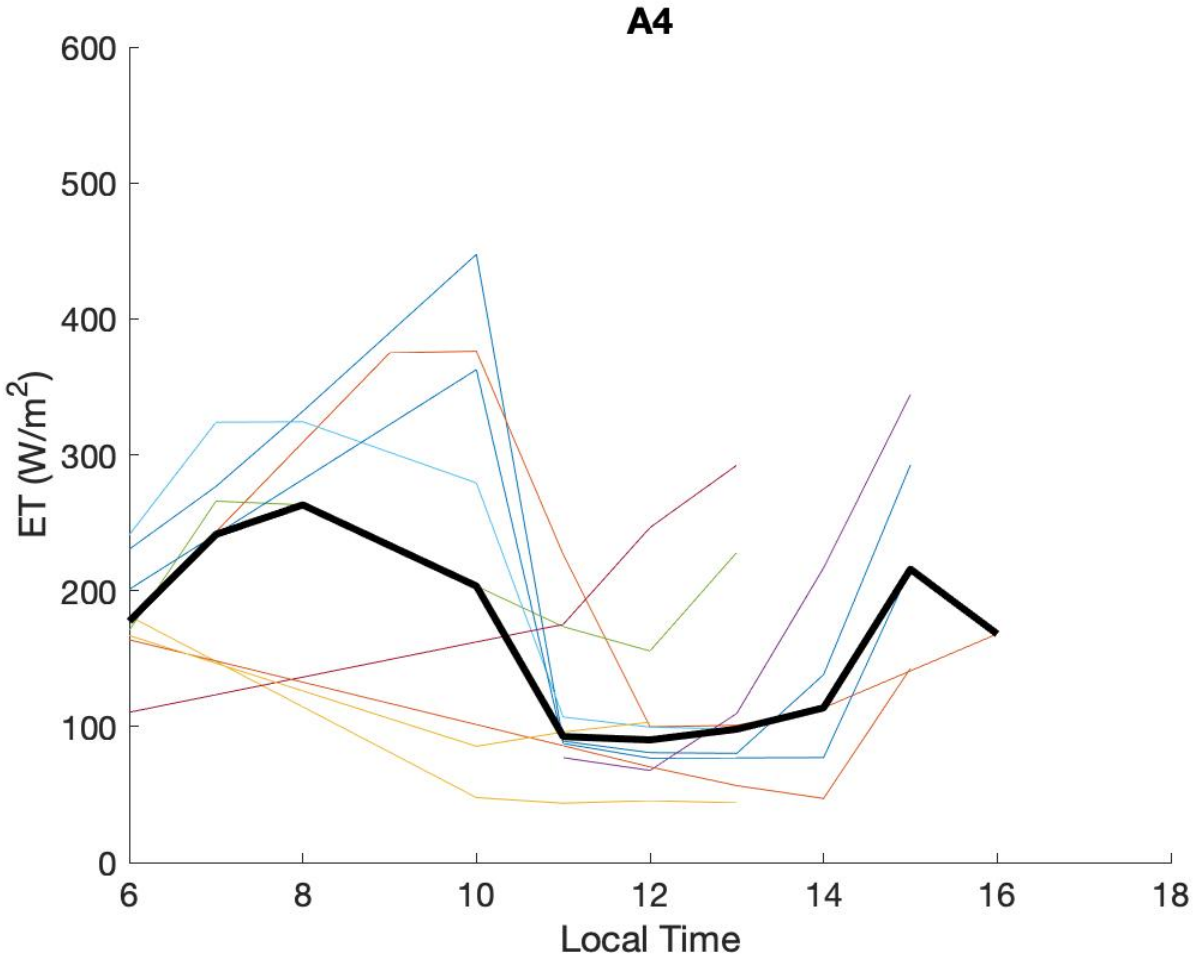
# Agricultural diurnal ET



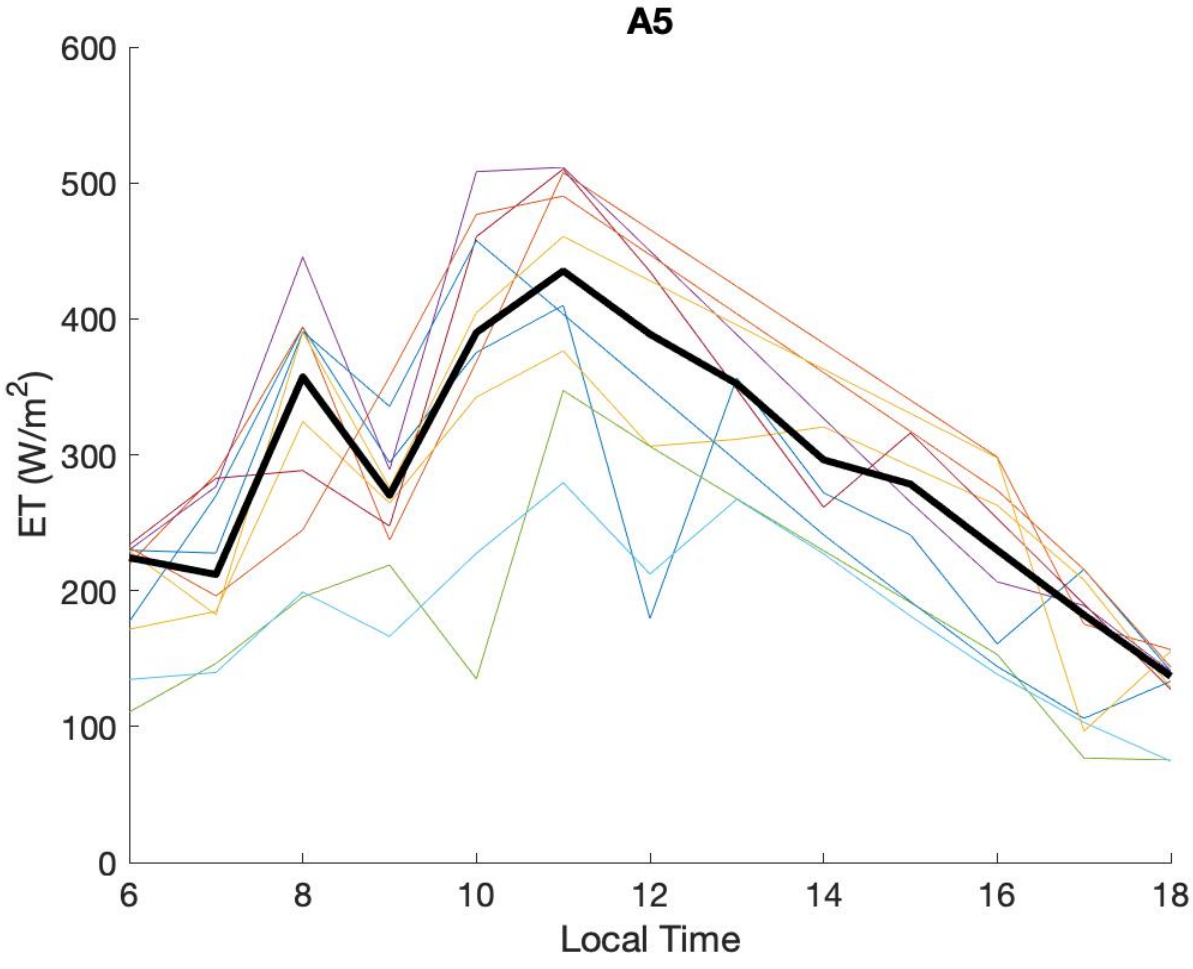
# Agricultural diurnal ET



# Agricultural diurnal ET



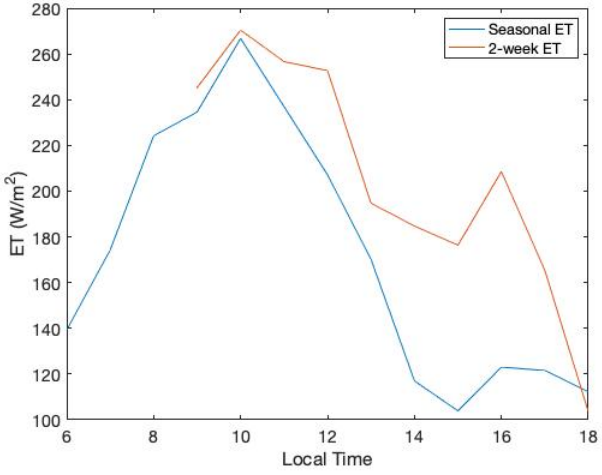
# Agricultural diurnal ET

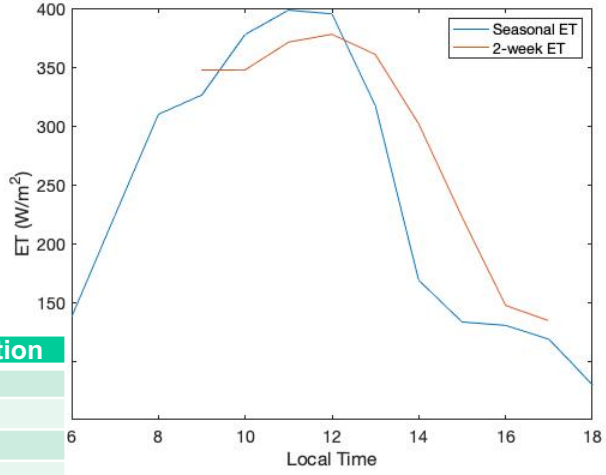


# Summary statistics

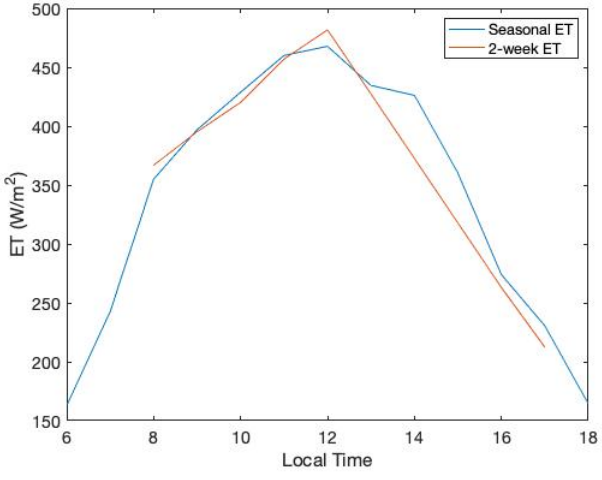
| Site | Max ET | Max Time | Dip Mag | Dip Time |
|---|---|---|---|---|
| B1 | 276 | 11am | 0.38 | 3pm |
| B2 | 463 | 12pm | 0.13 | 3pm |
| A1 | 376 | 11am | 0.29 | 3pm |
| A2 | 331 | 1pm | 0.23 | 2pm |
| A3 | 433 | 11am | 0.08 | 1pm |
| A4 | 211 | 10am | 0.41 | 11am |
| A5 | 436 | 11am | 0.27 | 9am |

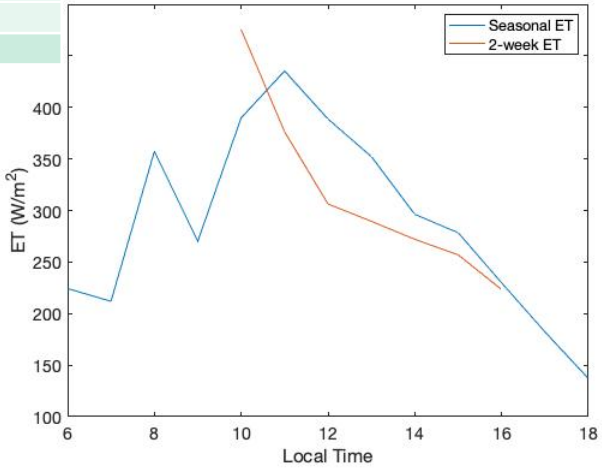
# Seasonal vs. two-weekly patterns



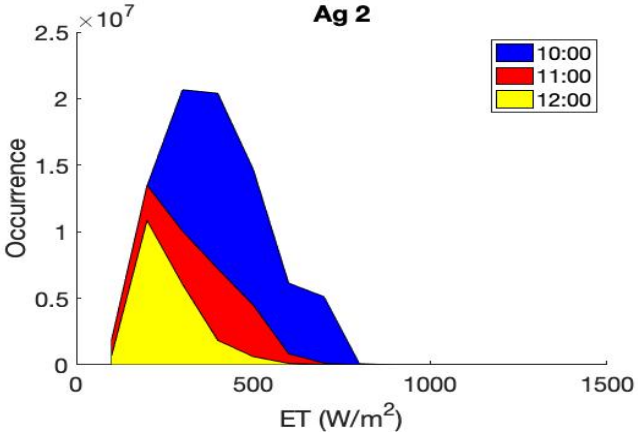



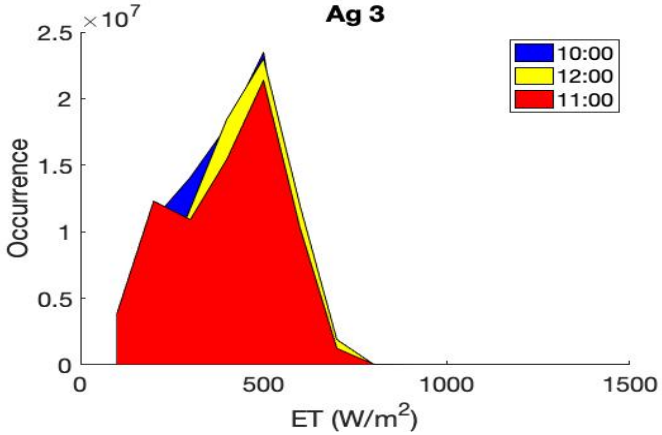

| Site | Time Start | Time Stop | Correlation |
|---|---|---|---|
| B1 | 7-Jun-19 | 20-Jun-19 | 0.86 |
| B2 | 10-Jun-19 | 23-Jun-19 | 0.97 |
| A1 | 4-Jun-19 | 17-Jun-19 | 0.92 |
| A2 | | | NA |
| A3 | | | NA |
| A4 | | | NA |
| A5 | 7-Jun-19 | 20-Jun-19 | 0.77 |

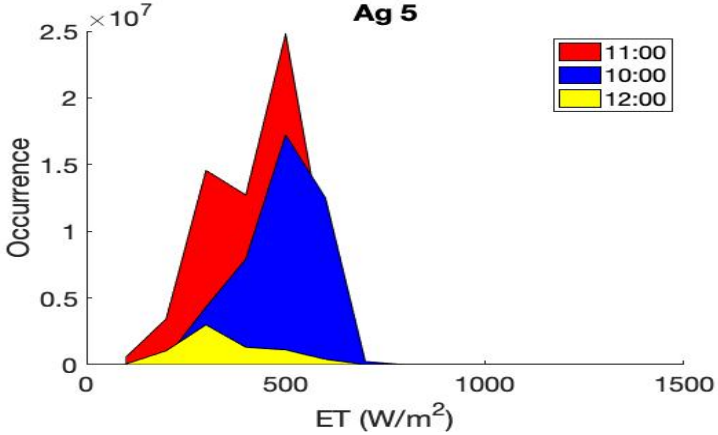


# Histograms of peaks

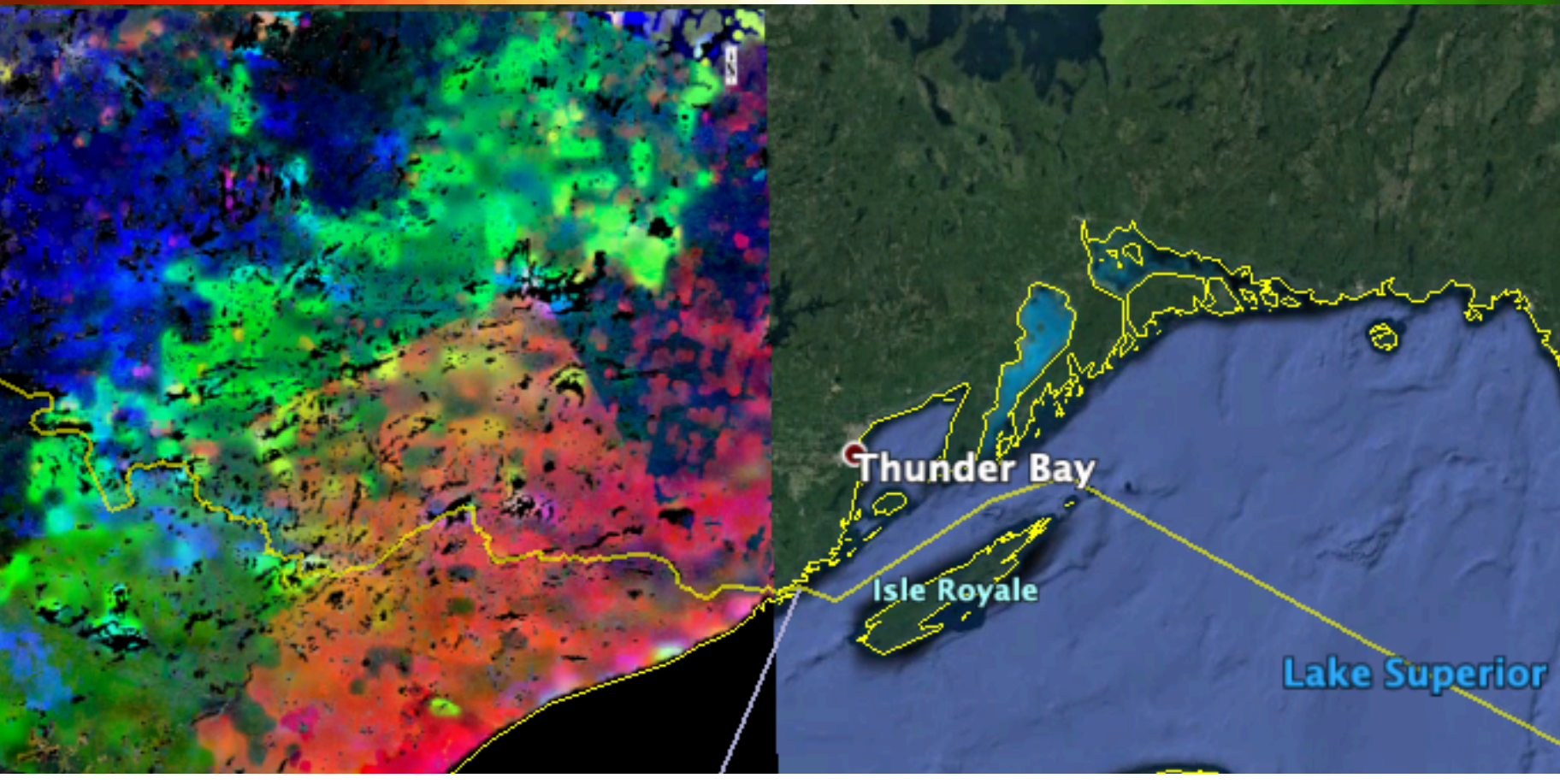


# ET peak time

# Plants waking up




Red = ET at 7am; Green = ET at 8am; Blue = ET at 9am.

# Conclusions

- Measurements cannot be obtained without ECOSTRESS
- Composite ET shows similar behavior to that observed in the field
- Complex dynamics
- Peak in ET at 11am – 1pm for all sites except India
- Potential for a dip in ET in both the morning and the afternoon

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