

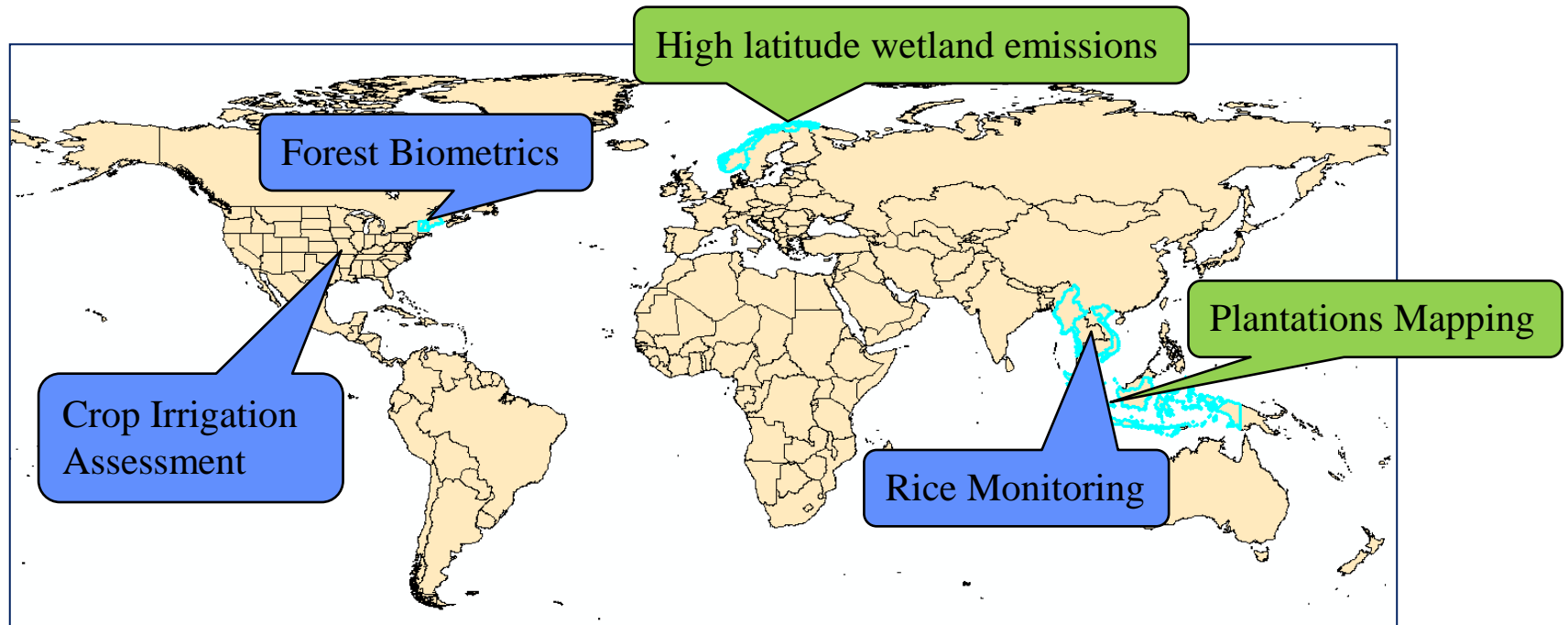
## K&C Phase 4 – Status report

*Operational rice mapping and forest structure assessment  
to support the 3Cs*

*Nathan Torbick, William Salas, Xiaodong Huang  
Applied GeoSolutions*

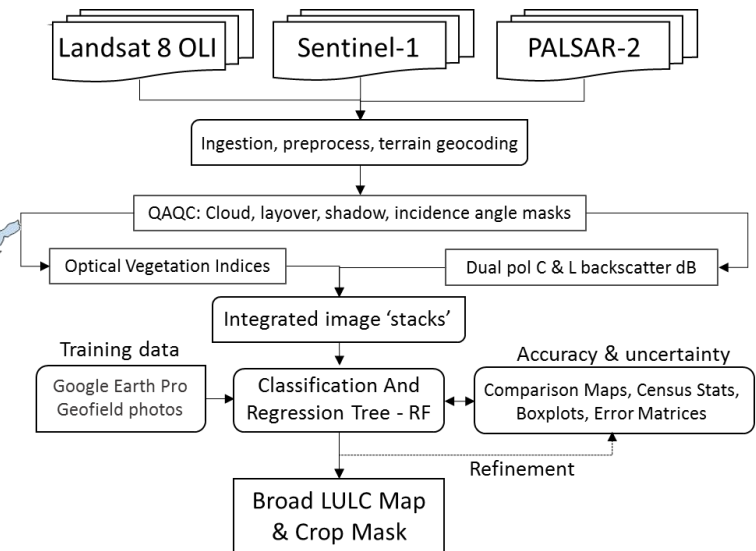
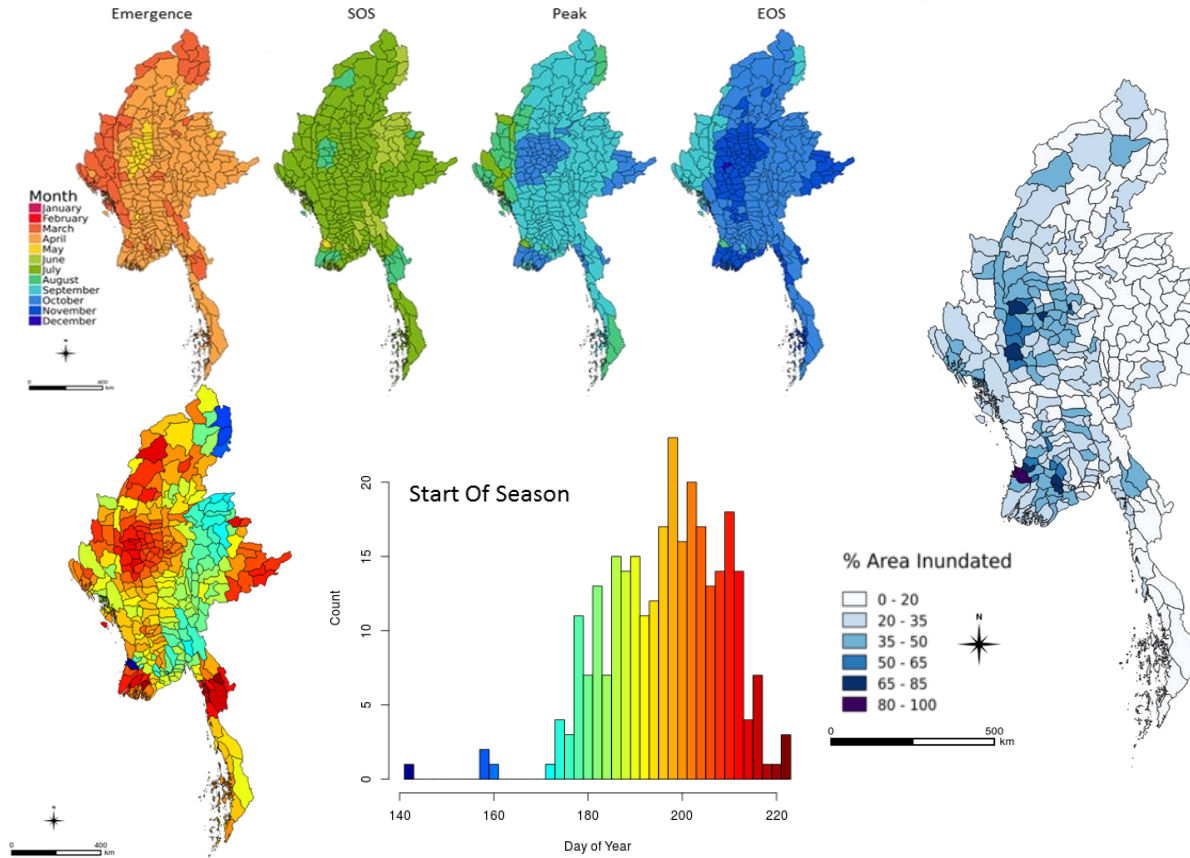


## Map of ongoing projects leveraging PALSAR-2 & supporting K&C



## Results and significant rice findings thus far

### Maps of rice attributes across Myanmar using Sentinel-1, PALSAR-2, and Landsat-8

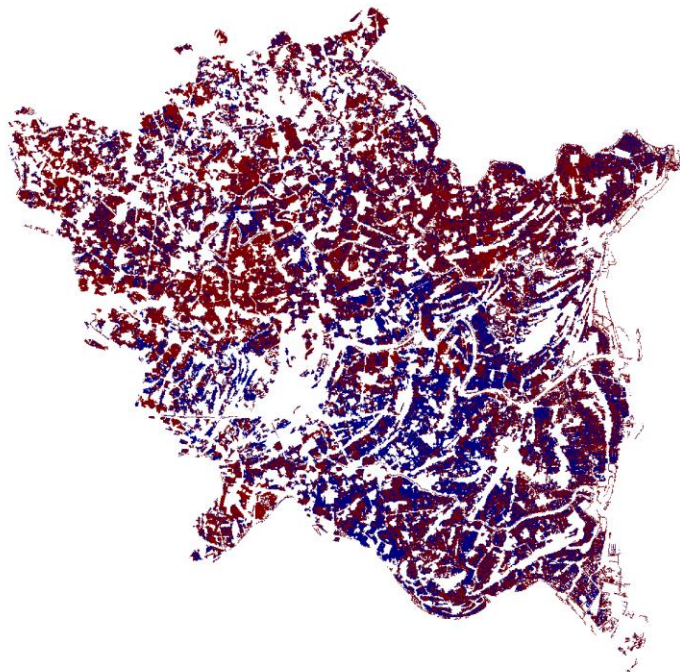




## Results and significant findings thus far

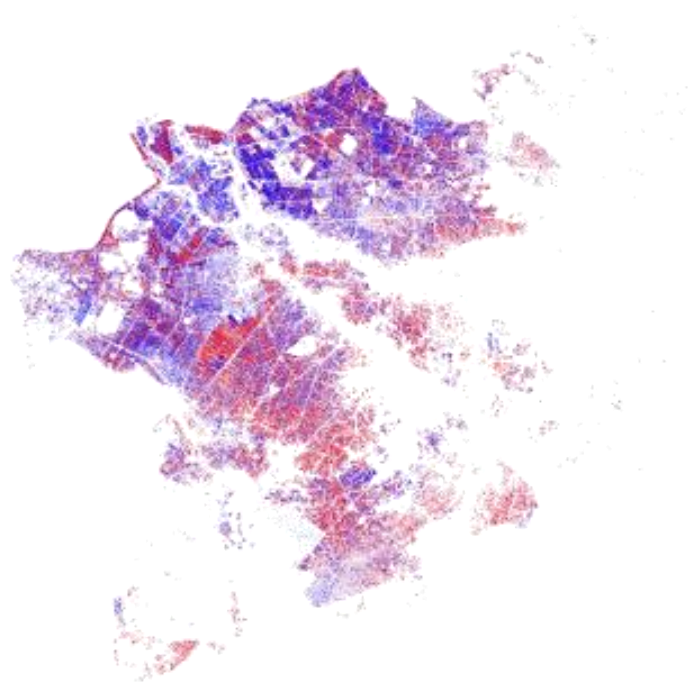
- Mapping AWD w/ Radarsat-2, Sentinel-1 IW, and Palsar-2 ScanSAR

20170706



Thai Binh, Vietnam

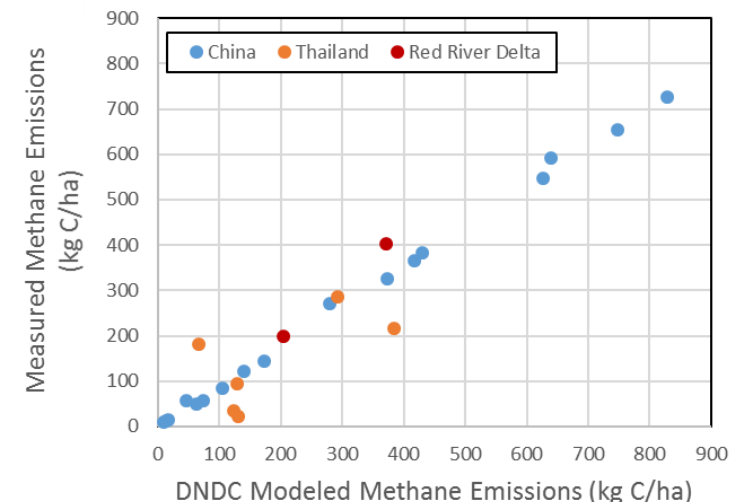
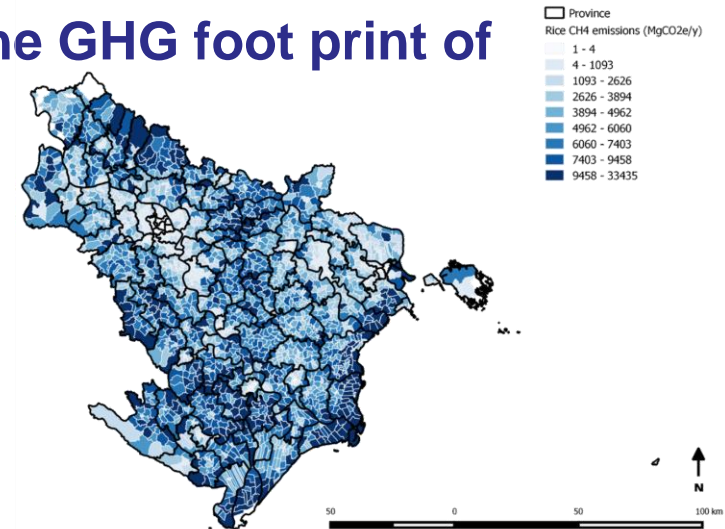
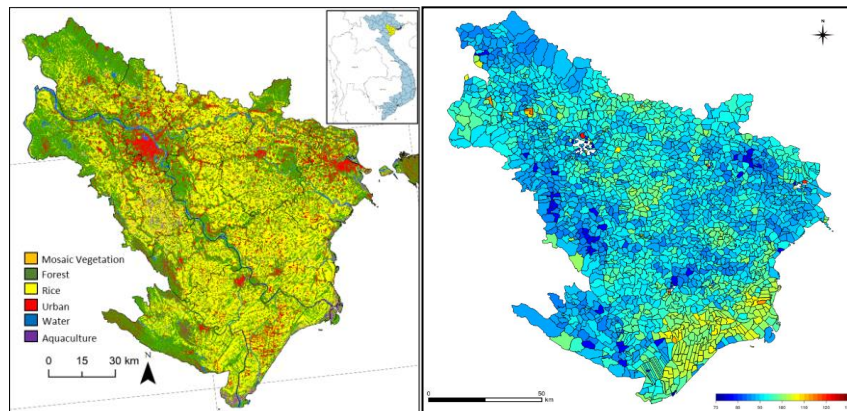
Day 209 2016



Mekong Delta, Vietnam

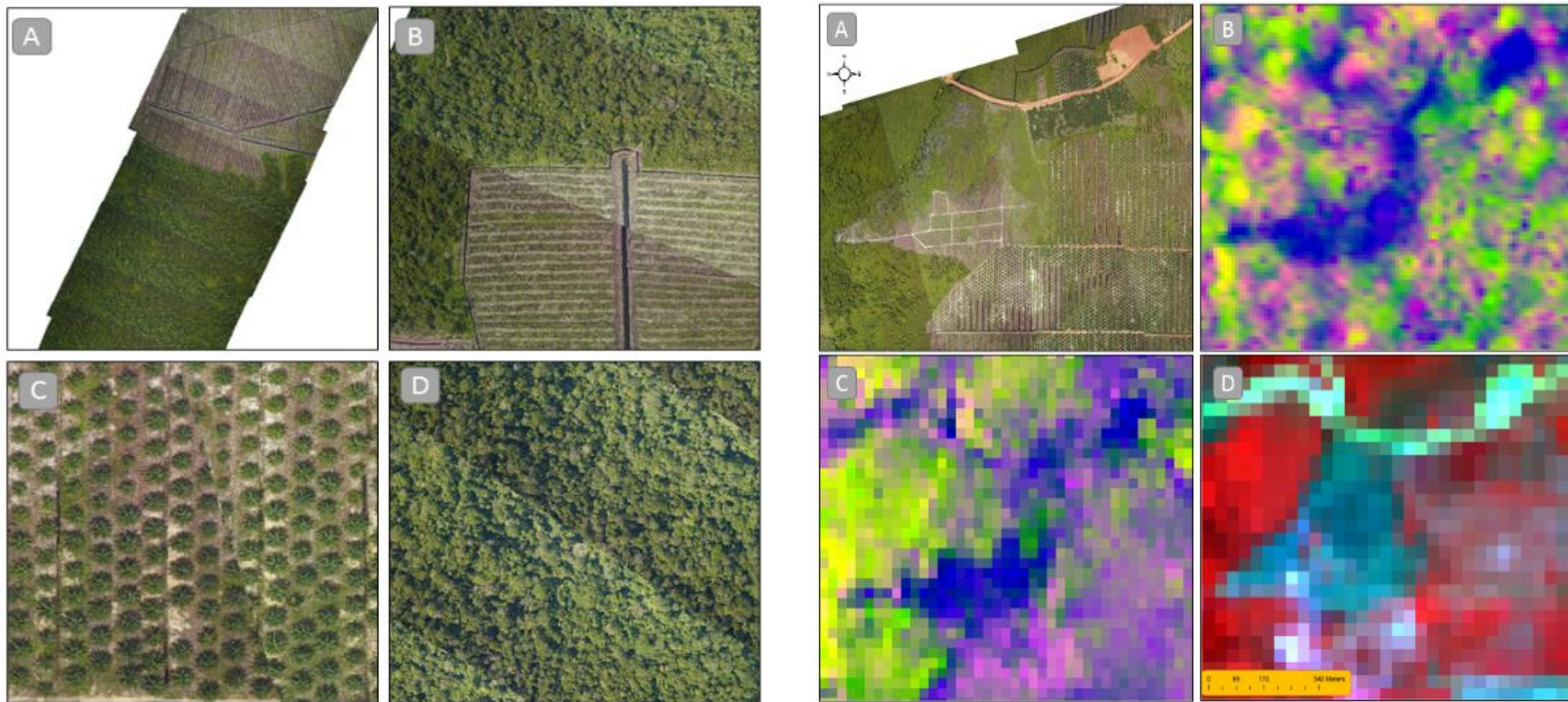
## Results and significant findings thus far

- Using inundation maps to drive DNDC (GHG, yield)
- Alternative Wetting and Drying (AWD) half the GHG foot print of Continuous Flood (CF)





## Results and significant plantations findings thus far

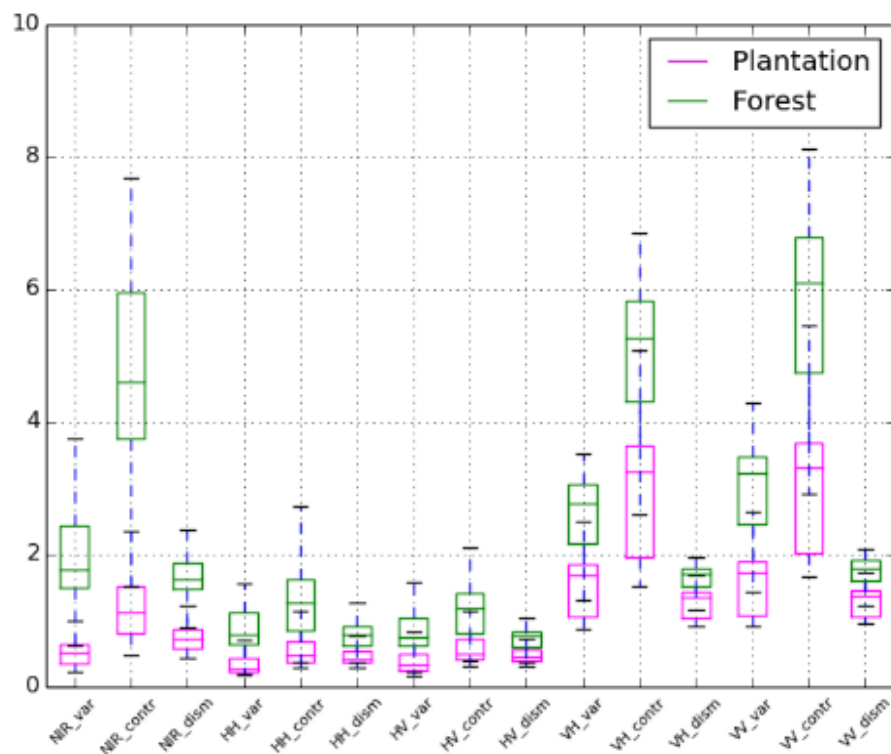


Right) Co-located examples of (A) airborne imagery; (B) Sentinel-1 (R:VV,G:VH,B:VH2); (C) PALSAR-2 (R:HH,G:HV,B:HV2); and (D) Landsat-8 (R:5, G:4, B:3).

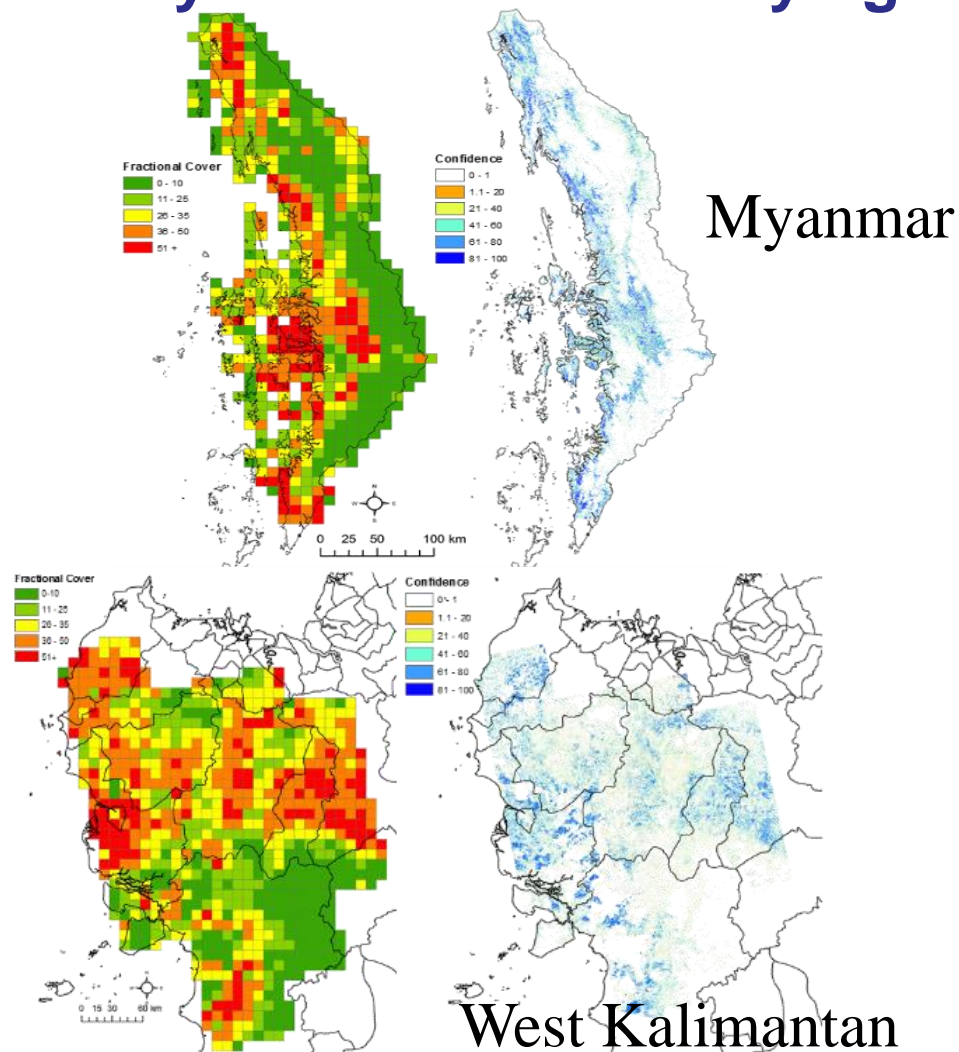


## Results and significant plantations findings thus far

- P2 texture and time series optical key indices for classifying oil palm and rubber



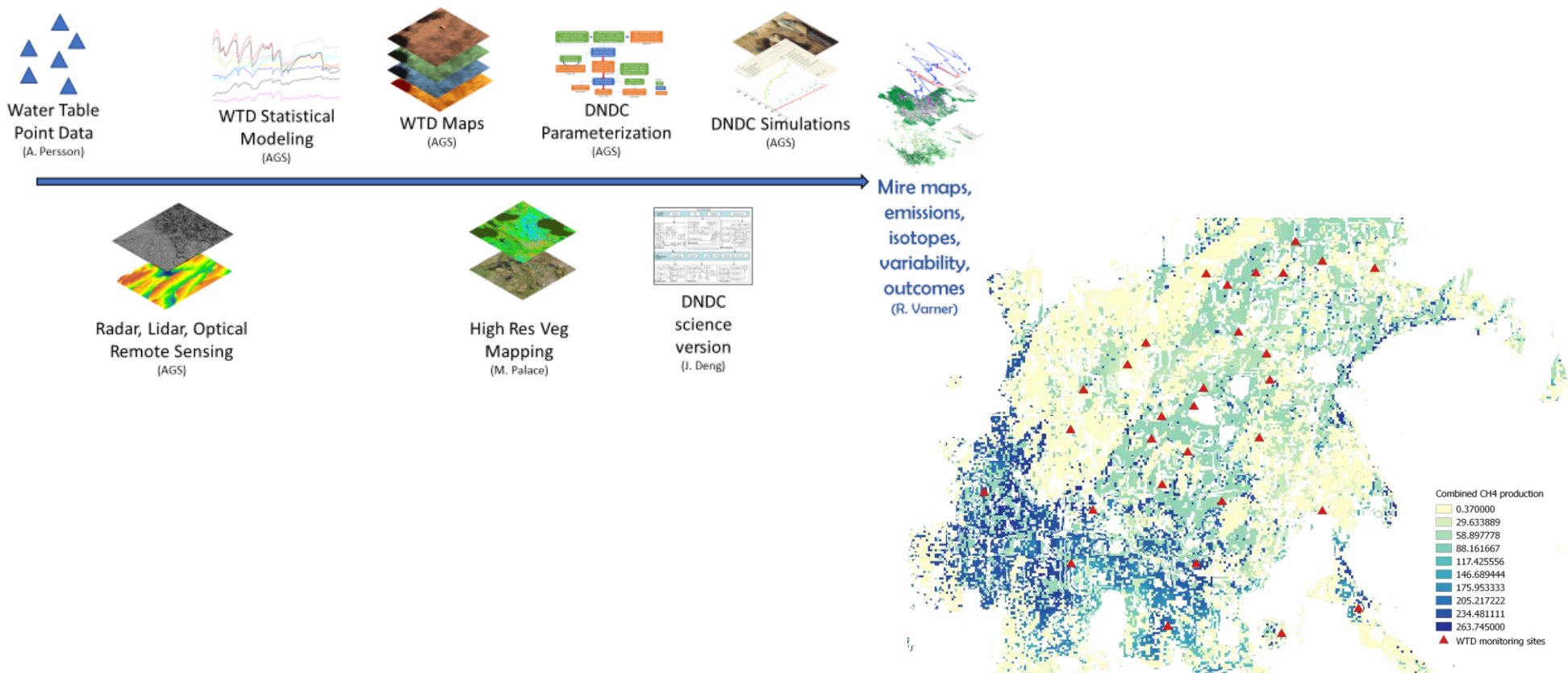
Torbick et al, 2016



## Results and significant high lat wetlands findings thus far

- P2 helpful for characterizing peat depth, soil moisture, and water table dynamics > drivers of methane

Spatiotemporal scaling workflow





## Project milestones

List the project milestones until...(the end of Phase 4)

- ☐ Map of plantations and LCLUC in pilot regions
- ☐ Assessment of regrowth (2007-2017), ABG, FSH, & CCC (northeast USA); co-collected UAS lidar, airborne S-band, space-borne SAR, TLS, field plots in 2017 (happy to share with K&C teaming)
- ☐ Assessment of AWD in Thai Binh, Vietnam & Arkansas USA; maps of yield and soil moisture with multi-source SAR and optical fusion
- ☐ Emissions maps of Stordalen Sweden CH<sub>4</sub>
- ☐ Coordinated super sites?

## Deliverables etc.

- K&CP4 v1 completed: forest biometrics, rice & high lat wetland GHG maps, geofield photos, rice maps for Myanmar, InSAR FSH maps (with Paul and Yang), Indo maps (with Dirk)
- Recent Publications (algorithms, maps, accuracy tables, etc...)
  - Torbick,... 2017. Monitoring rice agriculture across Myanmar using time series Sentinel-1 assisted by Landsat-8 and PALSAR-2.
  - Torbick,...2017. Mapping rice greenhouse gas emissions in the Red River Delta Vietnam, Carbon Management
  - Torbick,...2016. Regional Mapping of Plantation Extent Using Multisensor Imagery, Remote Sensing
  - Recent meetings promoting K&C products: AMS 2018, IGARSS 2017, AGU 2017, Pecora20,...



- Sorry we can't be there. We miss you all!
- If of interest I'm happy to organize a K&C session for next AGU in December 2018 in Washington DC.
- Please let me know if of interest. Thanks!
- As always, happy to share any products, code, cal / val,....



Hoa Phan (student of Thuy @ CESBIO) visiting NH for collaborative SAR and DNDC work.  
Some fun skiing with Nate and Sawyer (age 7)!