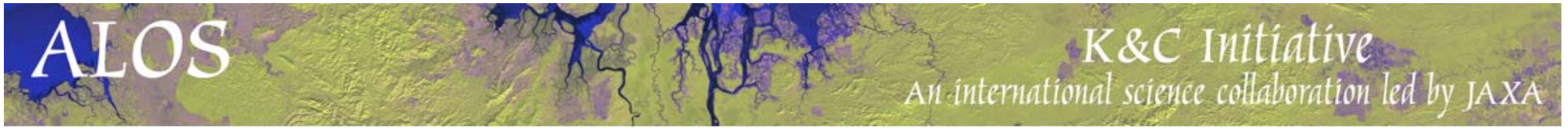

K&C Phase 3 – Brief project essentials

Application of PALSAR for regional assessments of forest disturbance, agriculture and wetland habitats.

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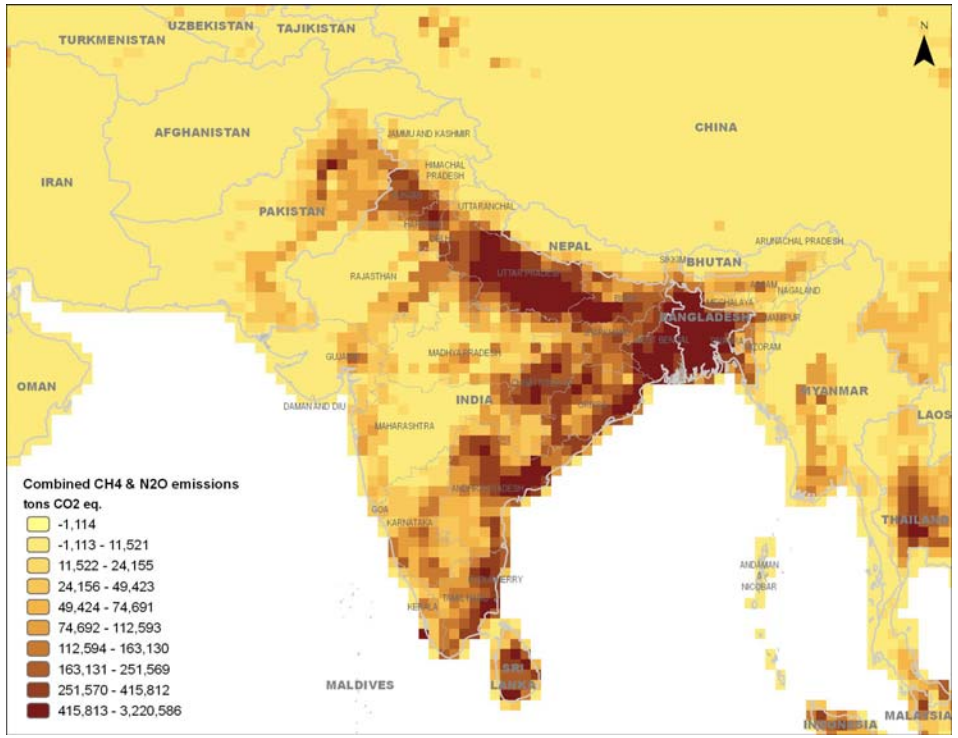
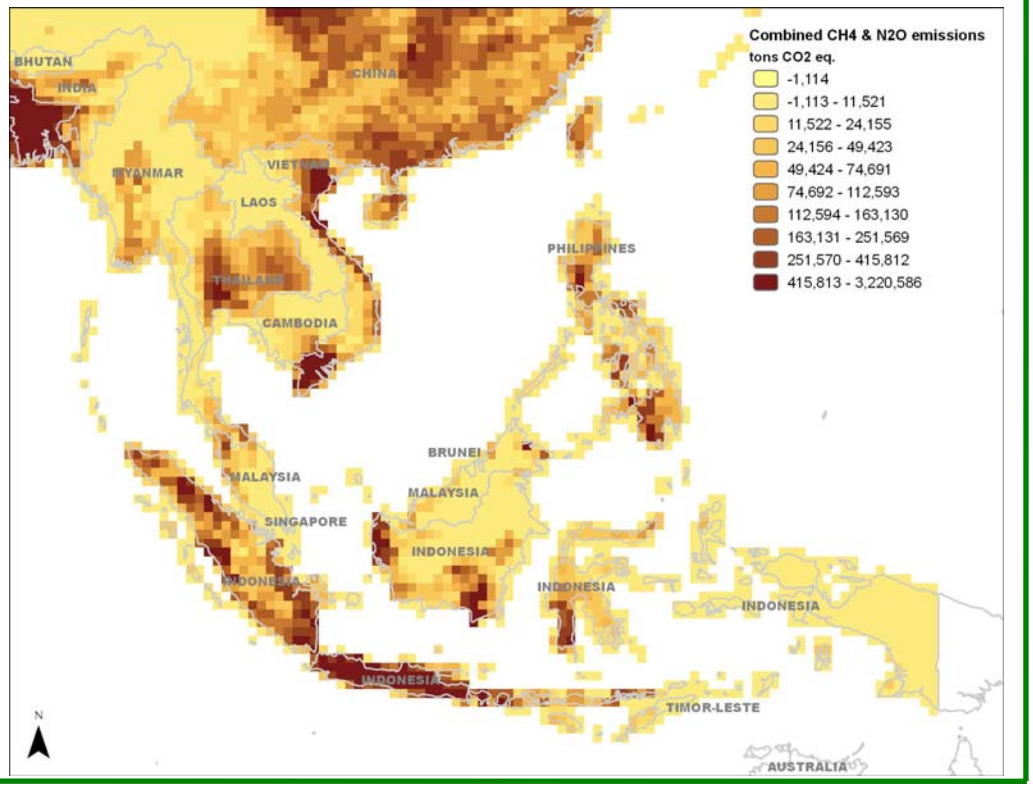
Collaborators:
Nate Torbick, Rob Braswell and Steve Hagen, AGS
Michael Palace and Changsheng Li, UNH
Xiaoming Xiao, OU
Jiaguo Qi, MSU
Sandra Brown, Winrock International
Guyana Forestry Commission, plus others

Science Team meeting #16 – Phase 3 Kick-off
JAXA TKSC/RESTEC HQ, Tsukuba/Tokyo, October 17-21, 2011

Focus Areas for Phase 3

- **Rice work – Asia and USA**
  - **Support regional CH4 estimates from rice: link to DNDC**
  - **Carbon offset protocols and project development**
- **Cropland mapping and monitoring: Monsoon Asia**





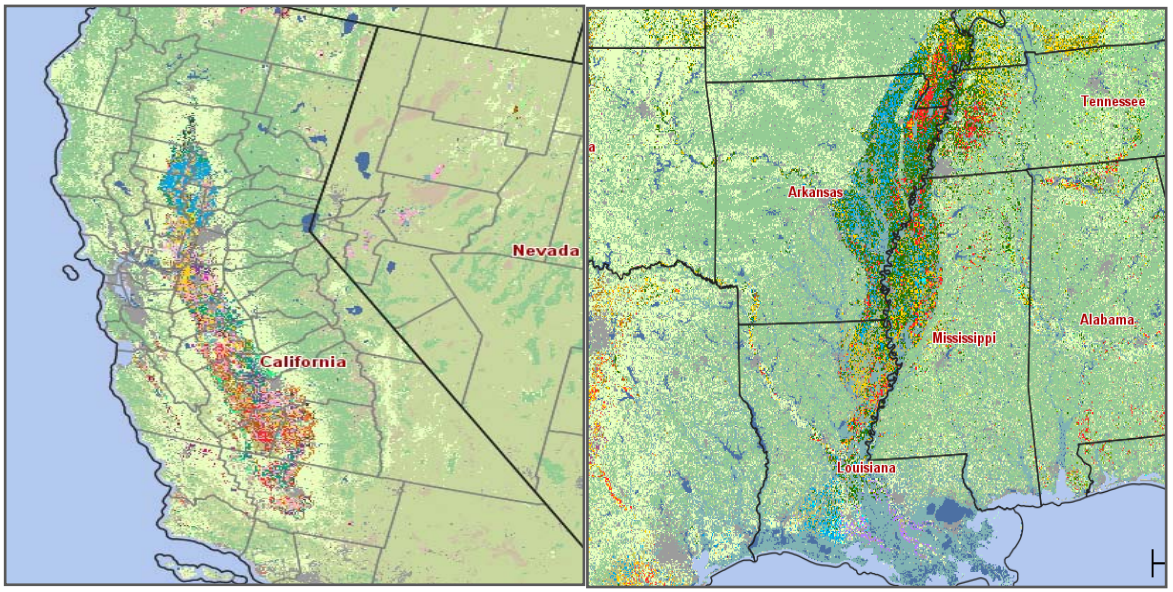
Focus Areas for Phase 3

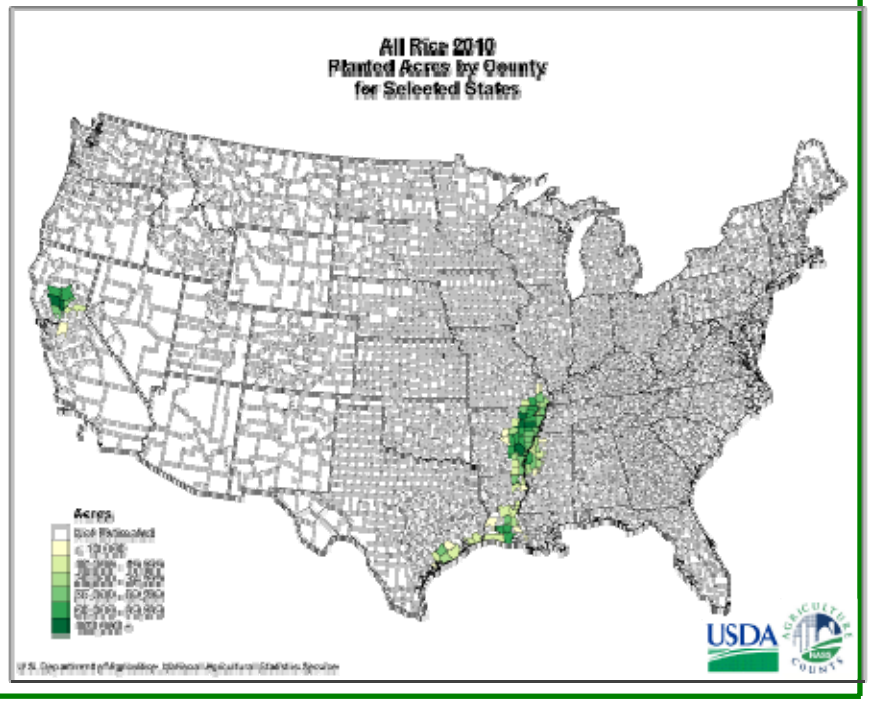
- Deforestation/degradation of the open forests – Brazilian Cerrado
  - Carbon assessment of open forests
- Deforestation/forest degradation – Guyana
  - Role of remote sensing in mapping and monitoring small disturbance (mines) and forest degradation (logging: concessions and illegal)
- Agriculture GHG mitigation and food security – Africa with CCAFS program
  - Building tools: remote sensing and landscape GHG modeling tools for assessment of carbon and GHG dynamics and assessment of C offsets to support climate adaptation

Project area(s)

USA Rice

DEMONSTRATING GHG EMISSION REDUCTIONS IN CALIFORNIA AND MIDSOUTH RICE PRODUCTION – Supported by NRCS CIG Grant





Project objectives and schedule

- implement a first-of-its-kind greenhouse gas (GHG) emission reduction demonstration initiative with rice producers in the USA (2012-2014)
- develop an innovative, user-friendly technology that enables rice growers to access immediate translation of practice changes to offset credit amounts (2011-2014)
- utilize remote sensing tools (PALSAR and optical) to drive the modeling and assessment routines as well as MRV themes (6/12 – 1/14)
- map current and historical patterns of irrigation and rice managements using PALSAR and optical archives (9/2012)

Support to JAXA's global forest mapping effort

As part of ongoing projects we plan to support calibration / validation using observations from Geofield photos. Geofield photos are science and "citizen science" based GPS photos and ancillary field data stored digitally (kml, shp, jpeg, etc…)

Field sites in California, midsouth, and with other projects the northeast, midwest, and southwest USA

Field data in NE US on forest biophysical attributes for assessing forest disturbance gradients with remote sensing. Source: timber cruising methods coupled with ground based lidar system for mapping canopy architecture.

Deliverables

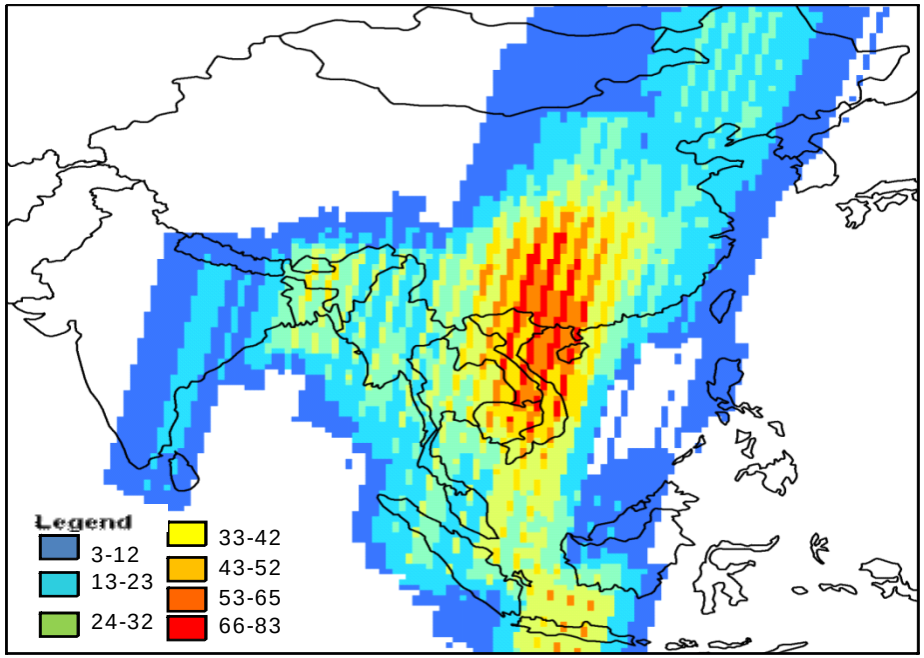
Schedule:

- 4/12 maps of rice extent for US
- 6/12 maps of Irrigation patterns (winter flooding for rice straw decomposition) and rice management for USA rice
- 8/12 Maps single versus ratoon rice systems, including separation of flood versus dry seedbeds.
- 12/12 Rice GHG emissions assessment for all of USA

Project area(s)

Monsoon Asia

- Quantifying changes in agricultural intensification and expansion in Monsoon Asia as part of a NASA Land Cover Land Use Change project (09-LCLUC09-2-24)



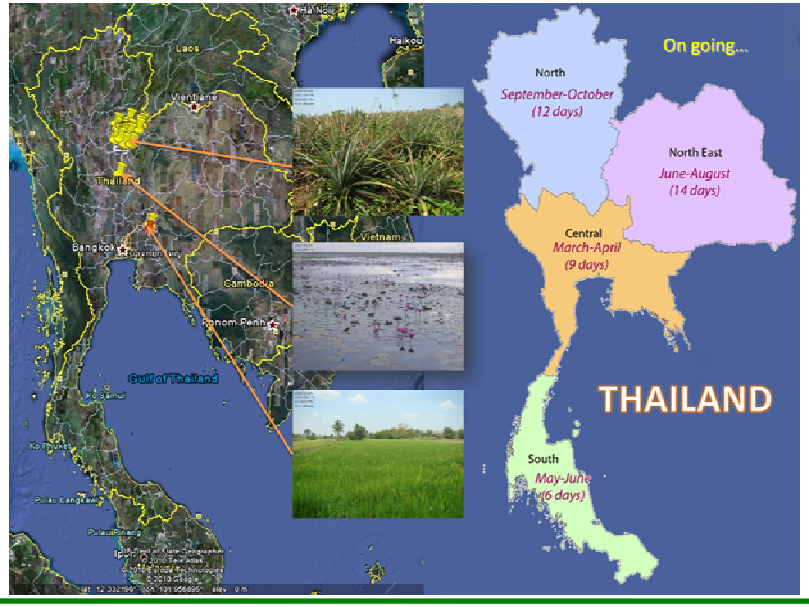
Project objectives and schedule

- Map rice extent, cropping intensity (single, double, triple), water use/irrigation, and crop production across Monsoon Asia using PALSAR (2011-2012)
- Map agricultural LCLUC across Monsoon Asia ~1997 -- ~2010 using JERS – PALSAR (2012-2013)
- Quantify changes in cropping intensity and irrigation using PALSAR-Landsat-MODIS for 2000, 2005, and 2010 across Monsoon Asia (2012-2014)
- Provide updated information on agricultural expansion (or loss) and intensification (irrigation, cropping intensity) in Monsoon Asia, as observed from Landsat and PALSAR images in 2007-2010, from Landsat images in 2005 and JERS-1 mosaic (GLS2005 plus USGS Landsat archive) and from Landsat images in 2000 (GLS2000 plus USGS Landsat archive)

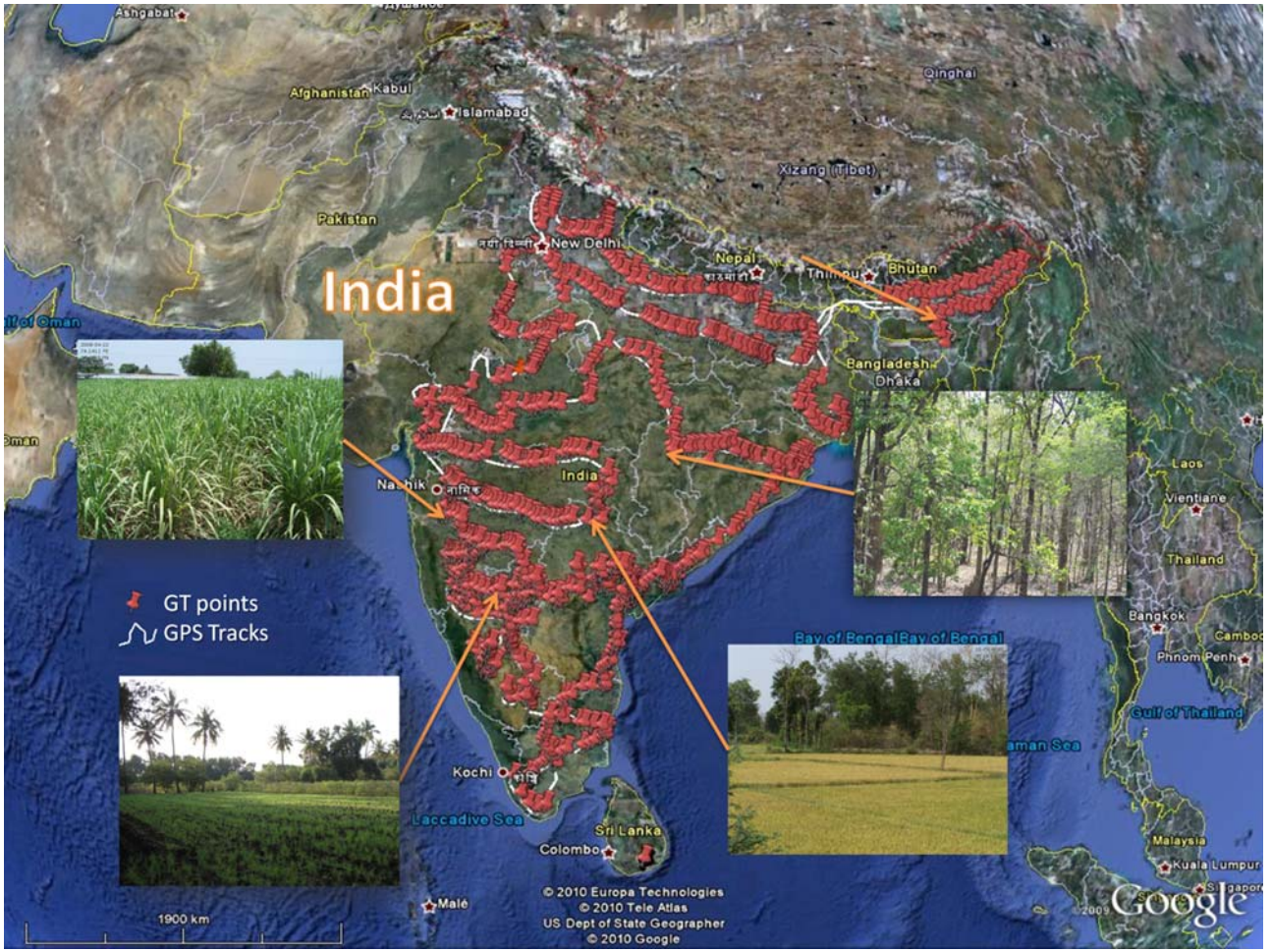
Support to JAXA's global forest mapping effort

As part of ongoing projects we plan to support calibration / validation using observations from Geofield photos. Geofield photos are science and "citizen science" based GPS photos and ancillary field data stored digitally (kml, shp, jpeg, etc…)

Database of over 10,000 field sites worldwide: can be used to validate JAXA products



Support to JAXA's global forest mapping effort



Deliverables

Schedule:

- 4/12: Version 1 of “2010” rice extent and cropping intensity in Monsoon Asia
- 8/12: Monsoon Asia agriculture LCLUC (1997 – 2010)
- Maps of cropping intensity and irrigation in monsoon Asia from multi-temporal Landsat and PALSAR images in 2007-2010
- 6/13: Version 2 of “2010” rice extent and cropping intensity in Monsoon Asia with PALSAR and optical fused obs
- 1/14 Publications on Monsoon Asia mapping efforts

Project area(s)

Guyana: Mapping Forest Degradation

Our focus region is Guyana. We are developing methods for mapping forest degradation using un-mixing of moderate resolution optical (Landsat/Spot), tree canopy tracing with high resolution (Geoeye, Worldview, etc) and PALSAR

Collaborating with Winrock International and Guyana Forestry Commission. Field data on disturbance gradients – primarily from logging.

This work is supported by the Clinton Climate Initiative, Guyana Forestry Commission and Winrock International.

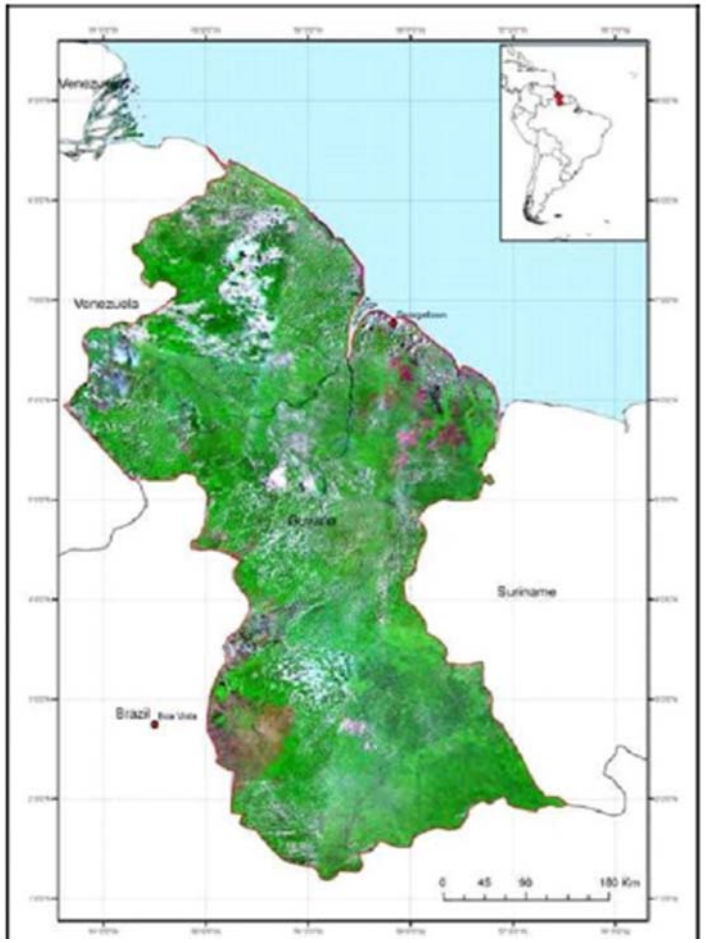


Figure from GFC

Project objectives and schedule

- Map logged areas with Landsat, RapidEye, GoeEye and PALSAR . (2011-early 2012)
- Compare these degradation metrics with field data (collected in 2010 and 2011).

Support to JAXA's global forest mapping effort:

- working on agreement with Winrock regarding use of the field data for validating JAXA global forest mapping products

Deliverables

Schedule:

- 6/2012: 2008 and 2010 maps of forest degradation.
- Longer term work is pending and dependent on funding.

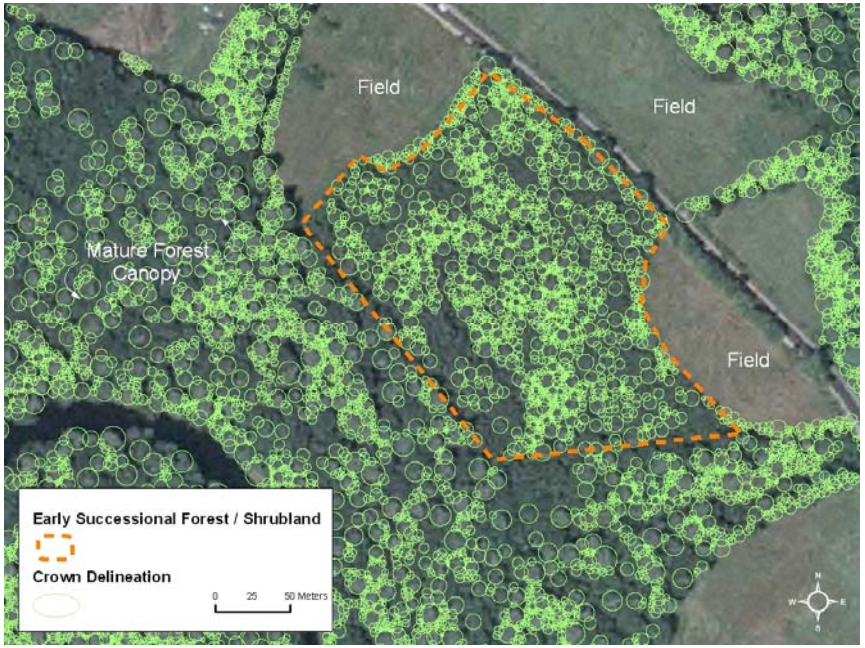
Project area(s)

Brazilian savanna (*cerrado*):

Our focus region is the state of Goías, Brazil. We will train and test our approach at nearly 100 locations across the cerrado and ultimately produce maps that cover the entire cerrado region.

Project objectives and schedule

- Use backscatter from PALSAR with reflectance observations from passive satellites (MODIS and Landsat with some high resolution imagery mapping individual trees) to make regional maps of land cover and biomass between 2007 and 2010 for the Brazilian savanna. (Year 1 & 2)
- Compare these dynamics to the state of land cover and biomass in ~1995 using a JERS/Landsat combined approach. (Year 3)
- This work will build off of a successful NASA funded Carbon Cycle Science project (NNX08AI24G) and directly contributes to the **C**arbon cycle science objects and focuses on an understudied biome.



Support to JAXA's global forest mapping effort

As part of a successful NASA funded Carbon Cycle Science project (NNX08AI24G), we can contribute ground observations of forest structure and biomass in the Cerrado region of Brazil. These data include 25 transect observations and 78 plot observations in the Brazilian states of Goiás, Bahia, and Tocantins. These ground observations will support the validation of K&C forest/biomass products across open canopy savanna land.

Deliverables

Schedule:

- 6/2012: 2007 map of biomass and land cover in the state of Goiás with associated uncertainty.
- 9/2013: 1996 & 2010 maps of biomass and land cover in the state of Goiás with associated uncertainty.
- 3/2014: Publish updated methodology for combining PALSAR and Landsat for mapping of land cover and biomass in tropical savannah.