K&C Irrigated Rice Products:

Understanding the influence of rice paddies on atmospheric CH_4

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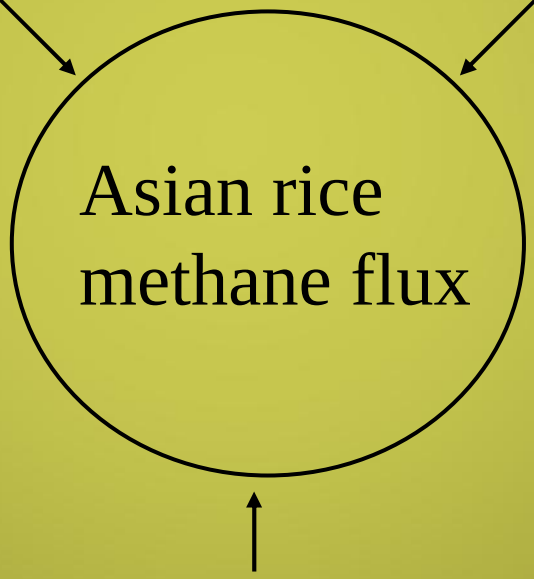
K&C Initiative, 8th Science Advisory Panel Meeting, June 2007

"Assessing the influence of Asian rice paddies on the growth rate of atmospheric methane 1980-2020"

Biogeochemical modeling - improving DNDC model for diverse Asian rice conditions

GIS Database Development - spatial data (climate, soil, etc.) used as input to DNDC



Remote Sensing Analysis - mapping rice location, phenology, and water management using RS (MODIS, PALSAR) data

MAPPING RICE with PALSAR – THE LOGIC

- **Timing is everything…**

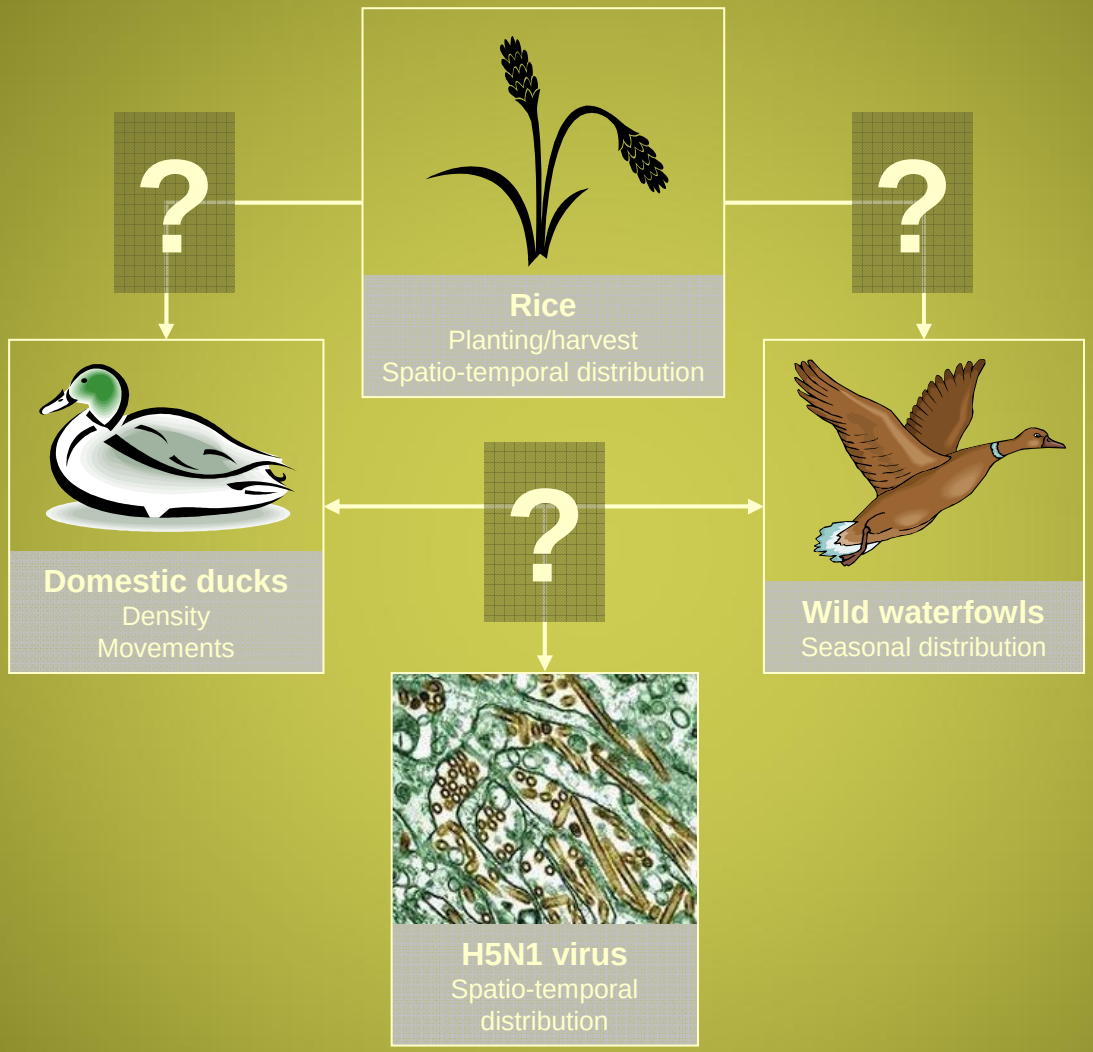
K&C Irrigated Rice Products

- *Data: PALSAR ScanSAR time series*
- *"Routine"*:
  - ***Paddy Extent***. Coverage to include all of Asia (China, India, SE Asia) which includes 90% of total rice area globally.
  - ***Crop cycles/phenology.*** Map single-, double-, triple-rice and rice/upland double cropping.
  - ***Flood Duration***. Period of inundation
- "Research":
  - ***Biomass/LAI development.*** Track biomass/LAI development.
  - ***Mid-season drainage.*** Quantify the presence of mid-season drainage.

Source of Funding and K&CI Schedule?

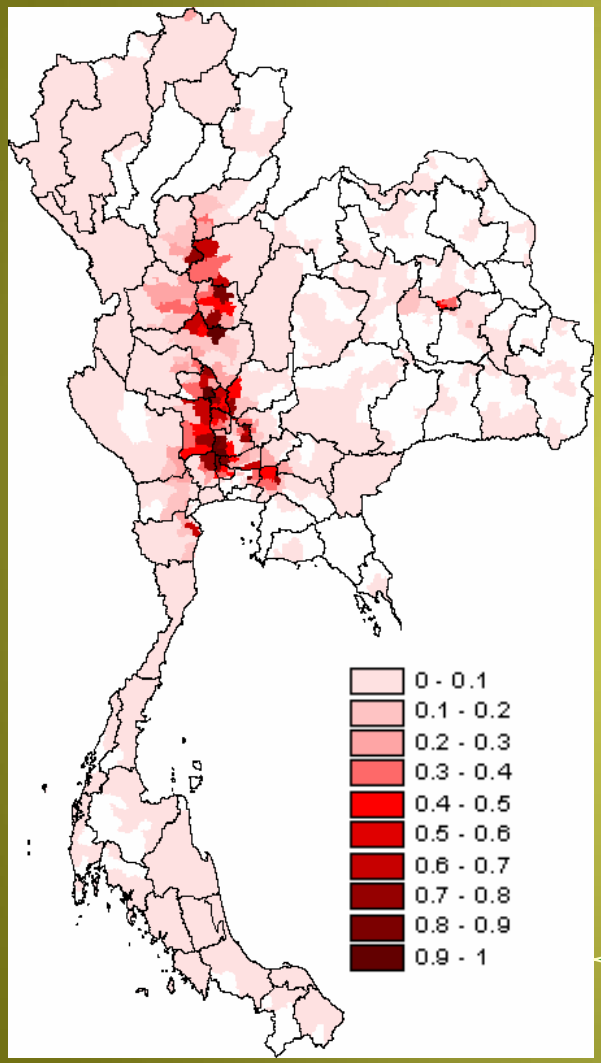
- **Leveraging off NIH funded Ecology and Risk Factors of Highly Pathogenic Avian Influenza in Asia (Xiao PI at UNH)**
  - **Mapping Cropland, Poultry and Wild Waterfowls with optical data (MODIS).**
  - **Demonstration with PALSAR (should be sufficient for prototype)**
- **NASA Decisions RFP (submitted)**
  - **Mapping Peninsular South East Asia, if funded, project would start January 2008.**
- **NIH SBIR Bio-Computing (Sept 07 submission)**
  - **Start: June 2008. China in year 1. SE Asia and India in years 2 and 3.**

Ecology and Risk Factors of Avian Influenza Virus



Interaction of wild waterfowls and domestic poultry in complex and dynamic waterbody (e.g., lakes, fish ponds) – wetland – cropland landscapes

Do wild waterfowls use croplands as part of their wintering sites?



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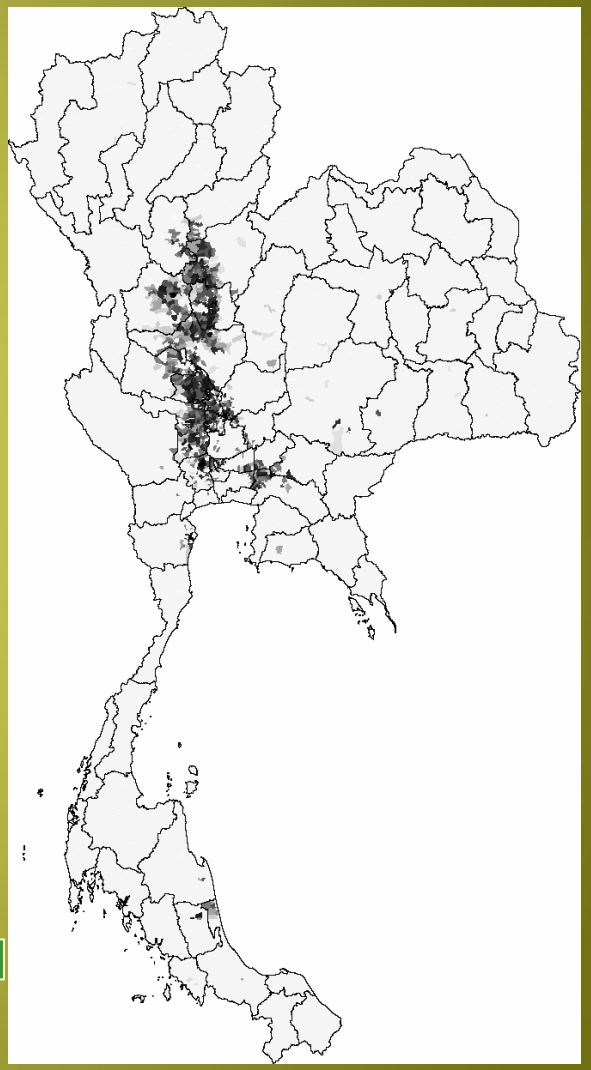
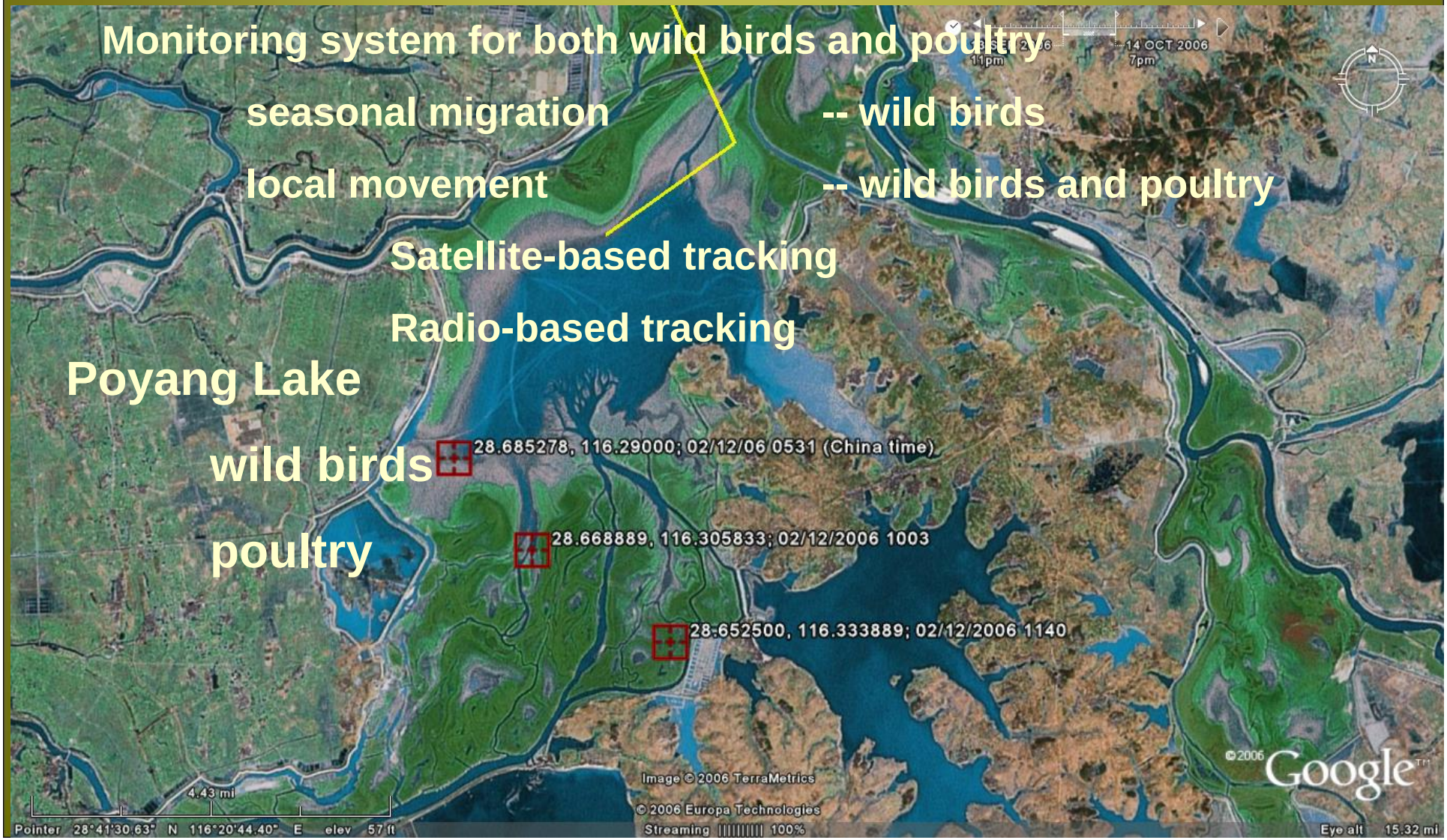


Rice in dry season

Free-range ducks

PALSAR Demonstration Site: Poyang Lake, China

Integrated surveillance, monitoring and analysis



Data Issues/Questions

- ASPERA system works well (test transfer rates ~10-15Mbps).
- Strip products: need specifics details on the header file information (discussed yesterday).
- Main PALSAR data products are SCANSAR.
  - Initial processing request of ORP-GEO. No data processed yet (cycles 7-10).
  - Change processing request to SLP to match other wetland data users and streamline processing. (will need s/w to project to map projection of choice. ASF?)

Prototype areas

- Poyang Lake, China
  - 6 Rice Field Sites
  - Cropping information: Plant and Harvest dates, upland crops as well.
  - Biophysical Data Collection: LAI, Plant Height, water depth (1-3 mid-season drainage events)
  - Frequency: field measurements every 8 days for entire 2007 growing season.

Prototype areas cont.

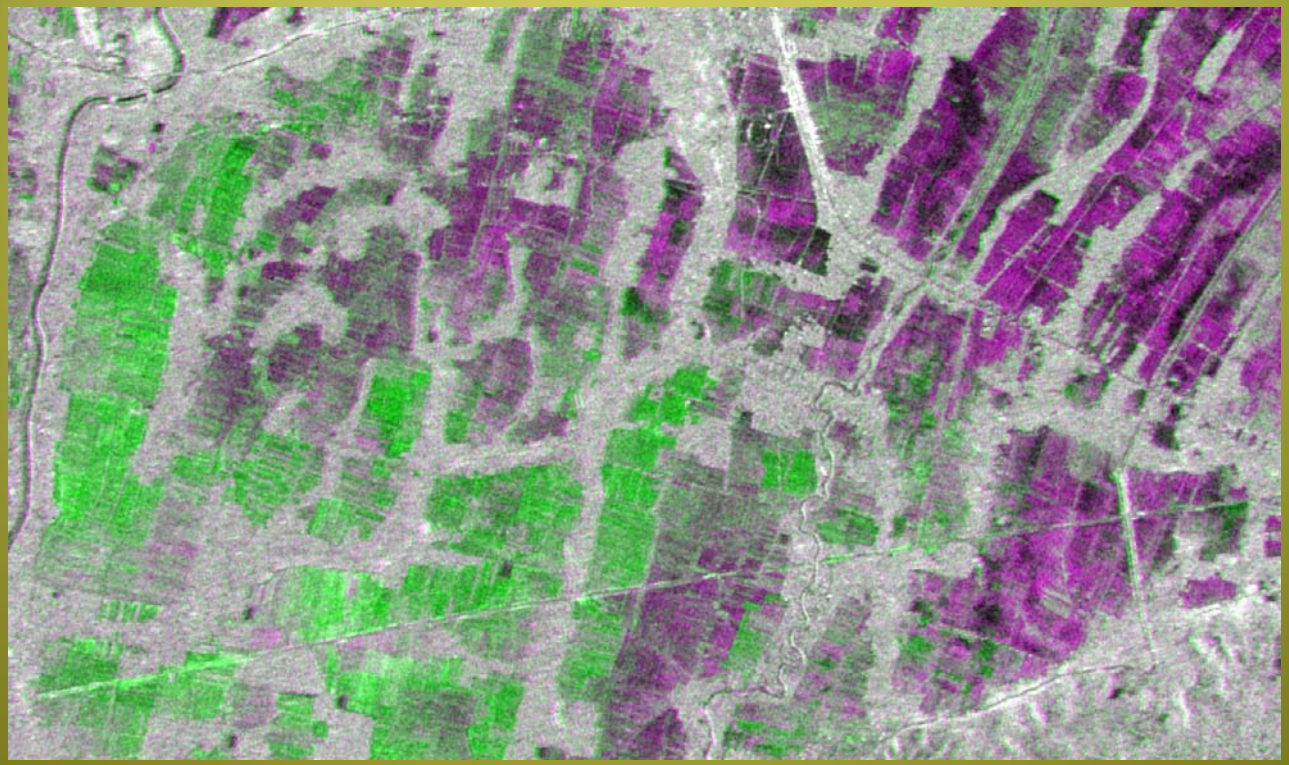
- Qintang River Watershed, Zhejiang Province, China
  - Routine field data collection is TBD, discussions with Zhejiang University in June 2007
- Java, Indonesia, survey field data (rice paddy location)
- Central Thailand, survey field data (rice paddy locations).

Processing Schedule

- Rice products require long time series of data prior to final processing.
- Current Status:
  - No time series of SCANSAR products (assume it is due to ORP-GEO issue)
  - Used AUIG 50 scene allocation for test data, limited by lack of multi-temporal data and seasonality of rice

Java Test Site Example

- ✓ Composite of FBS image from Dec 6th, 2006 (R&B) and Jan 21th, 2007(G).
- ✓ Green areas were flooded on Dec 6th, 2006 with new paddy rice on Jan 21th, 2007; purple areas had rice on Dec 6th, 2006 and were harvested by Jan 21th, 2007; dark grey areas were flooded areas on both dates; white areas were urban/residential areas; and others were covered with other unchanged vegetation.



Processing Schedule

- Rice products require long time series of data prior to final processing.
- Funding dependant: currently leveraging off a Avian Influenza project.
- 2007 data:
  - Poyang Lake Area: data collection from March 2007 through October 2007.
  - Poyang prototype area products by May 2008. Thailand and Indonesia sites and China regional demonstration by December 2008.