

Completion of work from Phase 1: 1

- **Hydrological field station data collection**

- **Description:** Process time series of ground water level data of **peat swamp forests** for calibration PALSAR. Note: $\pm 15\%$ Indonesia has peat soils.
- **Status:** Data are stored until July 2008; We still have to collect these data and will re-start the (20) instruments for another period of 3 years;
- **New time schedule:** Field expedition ~June 2009
- **Updated data requirement:** -
- **Deliverables:** Empirical relationship backscatter vs. ground water level and flooding fraction in peat swamp forests.
- **Other info:** Mawas international reference site for development REDD projects on tropical peat.



Completion of work from Phase 1: 2

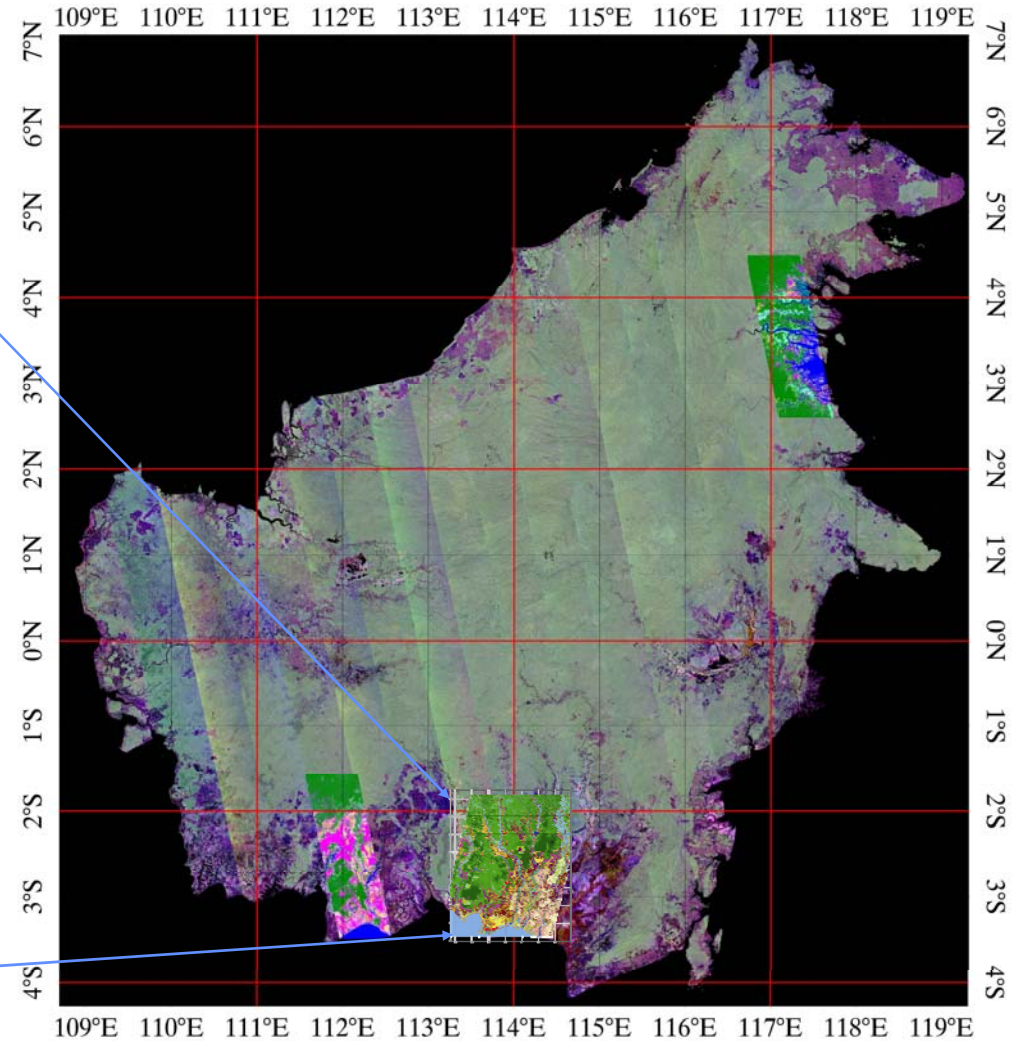
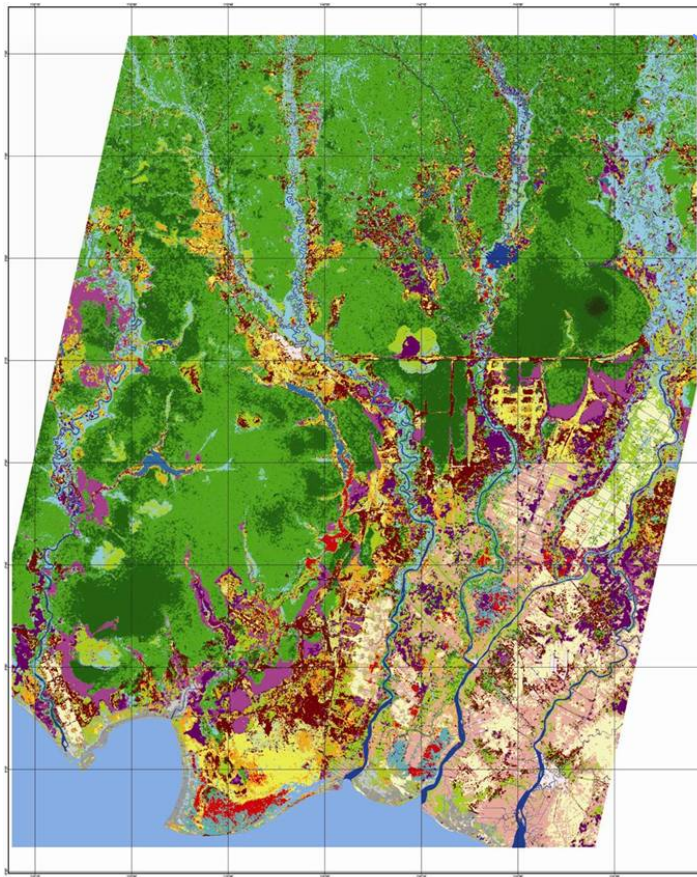
- **Mapping forest and land cover for the prototype areas – Papua & Sumatra**
 - Description: Maps for 2007; same methodology as demonstrated for Borneo.
 - Present status : Methodology and ample reference data available
 - New time schedule: \leq Dec 2009
 - Updated data requirement (if any): -
 - Deliverables: Map sheets ($3^{\circ} \times 2^{\circ}$), Report.
 - Other info: -



ALOS

K&C Initiative
An international science collaboration led by JAXA

Deliverables: Map sheets (3° x2°)



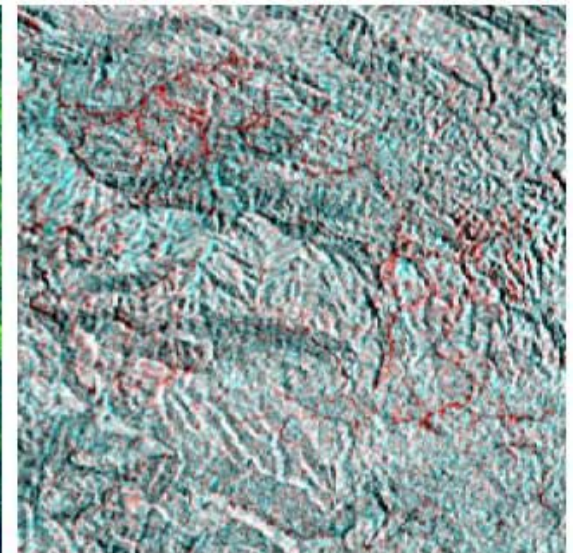
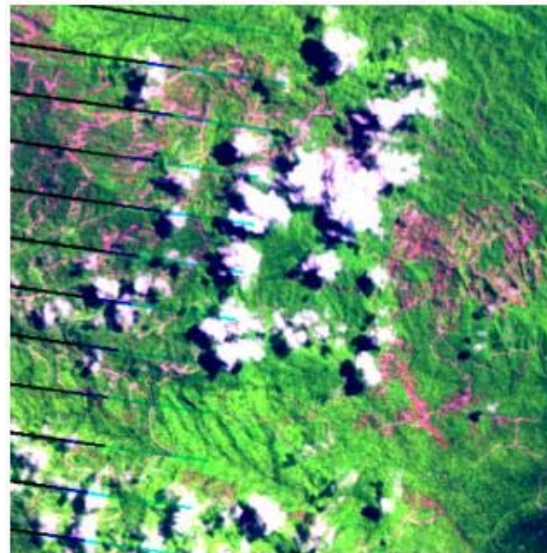
Dirk Hoekman, Wageningen University



WAGENINGEN UNIVERSITY
ENVIRONMENTAL SCIENCES

Completion of work from Phase 1: 3

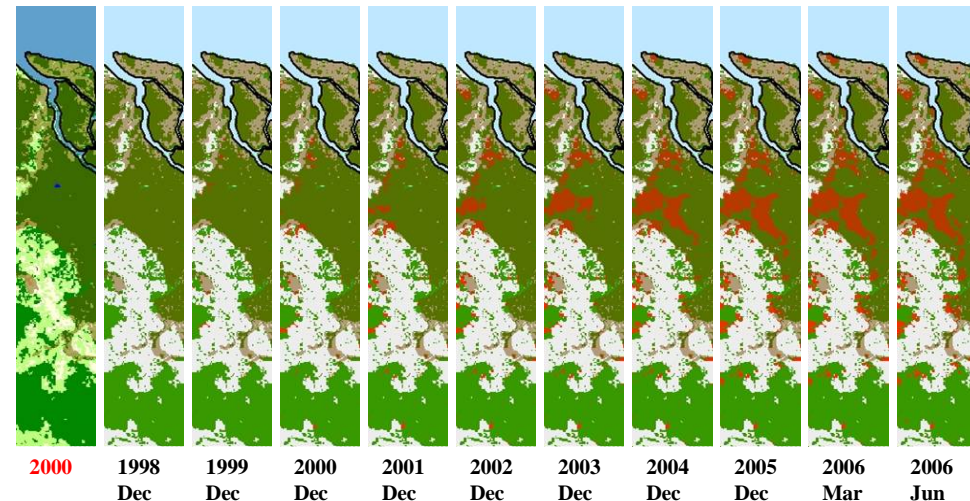
- **Annual change maps 2007-2008**
 - **Description:** Mapping deforestation and forest degradation for Borneo, Sumatra and Papua, using the 2007 forest and land cover maps and new data (FBS/FBD) of 2008
 - **Present status:** Land cover change methodology under development
 - **New time schedule:** June 2010
 - **Updated data requirement (if any):** -
 - **Deliverables:** Map sheets (3° x2°) , Report.
 - **Other info:** -



Completion of work from Phase 1: 4

- **Decadal change using JERS**

- **Description:** This task will be re-evaluated in the framework of **REDD requirements** (=baselines 1990, 2000, 2005 + trend analysis)
- **Present status/New time schedule:** Oct 2010?
- **Updated data requirement (if any):** More JERS data? (Note: GRFM mosaics are not orthorectified)
- **Deliverables:** Maps for (parts of) Borneo, Sumatra and Papua
- **Other info:** -



Extension Phase Proposal: 1

Annual monitoring of tropical forest and land cover in **SE Asia&PNG**

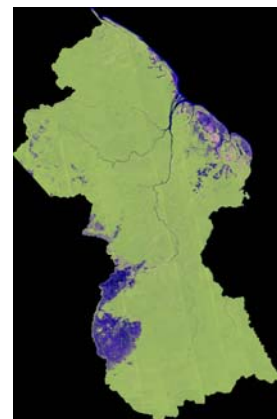
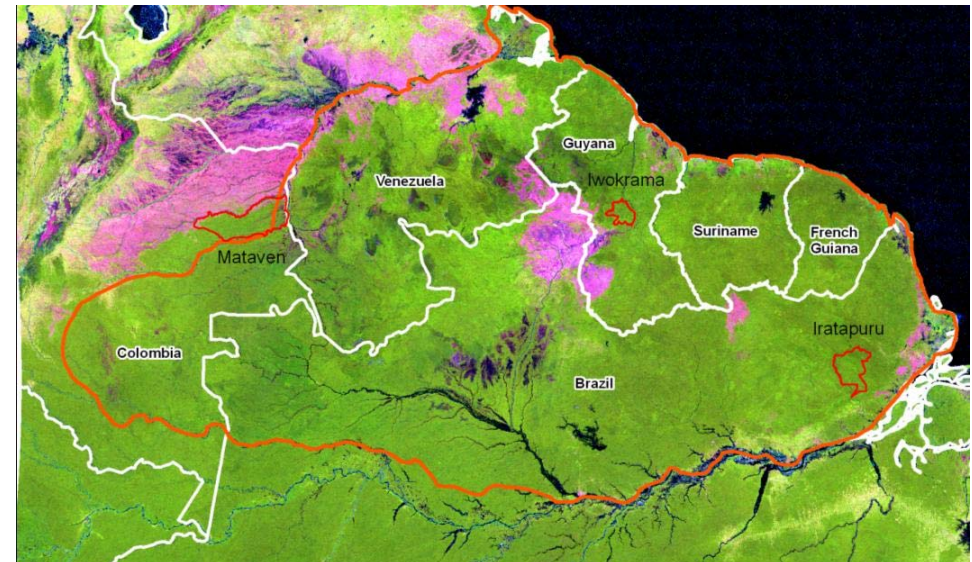
- Project objective(s): Continental wide maps at 50 m resolution. **Systematic production of yearly updates** (2008-2011) for Peninsular Malaysia, Borneo, Sumatra and New Guinea, showing land cover change, deforestation, inundation characteristics, and basic information on biomass and disturbance/degradation. Following IPCC/LCCS guidelines. Borneo maps may be considered as part of the Netherlands contribution to the GEO task Forest Carbon Tracking (probably these will be made at higher resolution in coordination with NIES).
- Project area: Insular SE Asia and PNG (B3 & C1)
- Outline of project plan: Using methodology demonstrated for Borneo (FBS/FBD) extended with ScanSAR cycles to include proper wetlands (mainly peat forests) mapping. Optional use of MODIS. Development of robust time series analysis protocols. Strong focus on validation. For mangroves the mangrove sub-group protocol will be followed. Development of fast processing chain.
- Time schedule: maps until 2009 in 2010; maps 2010 in June 2011; maps 2011 in Dec 2011
- Definition of deliverables: Map sheets (3° x 2°) on website. Several data layers, such as land cover change and inundation. Reports to JAXA.
- Data requirements
 - PALSAR FBS+FBD (once yearly) and ScanSAR (≥ 4 times/year)
 - K&C strip data, slant range (If possible, FBD strips a little bit wider)
- Other issues: More focus on development of REDD projects. Intensive cooperation with Indonesian Ministry of Forestry and provincial governments.

Dirk Hoekman, Wageningen University

Extension Phase Proposal: 2

Annual monitoring of tropical forest and land cover, pan-tropical approach

- Project objective(s): Idem, extending to selected tropical rain forest areas in South America and Africa. Development of **global approach/standardisation**.
- Project area: **Colombia, Guyana, Surinam and Gabon**
- Outline of project plan: idem
- Time schedule: idem
- Definition of deliverables: idem
- Data requirements: idem (if possible, FBD strips a little bit wider)
- Other issues: Strong local partnership in place. Extend/enforce cooperation within K&C



Dirk Hoekman, Wageningen University

Extension Phase Proposal: 3

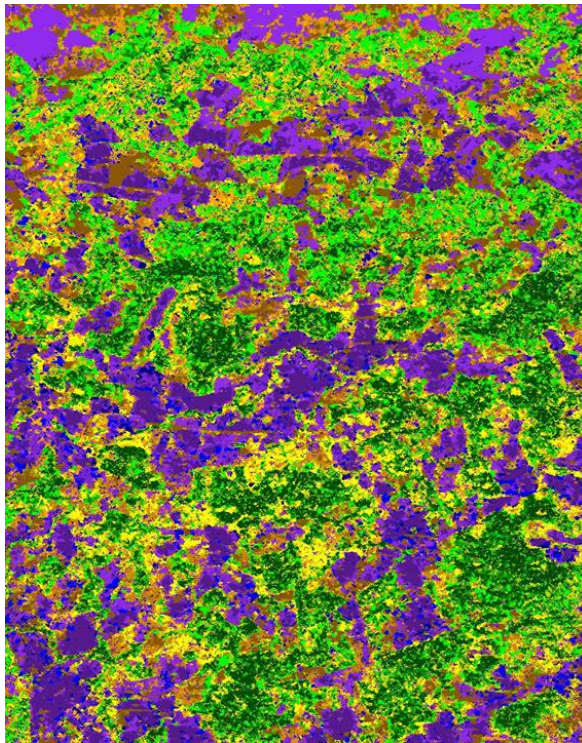
For **Colombia** (and a small site in Peru) several detailed studies at selected sites will be carried out under the coordination of Marcela Quiñones to advance ecosystem mapping techniques and to contribute to validation. Good ground data sets are available or will be collected by local specialists.

These studies do not require PALSAR data other than already requested for extension proposal 2.

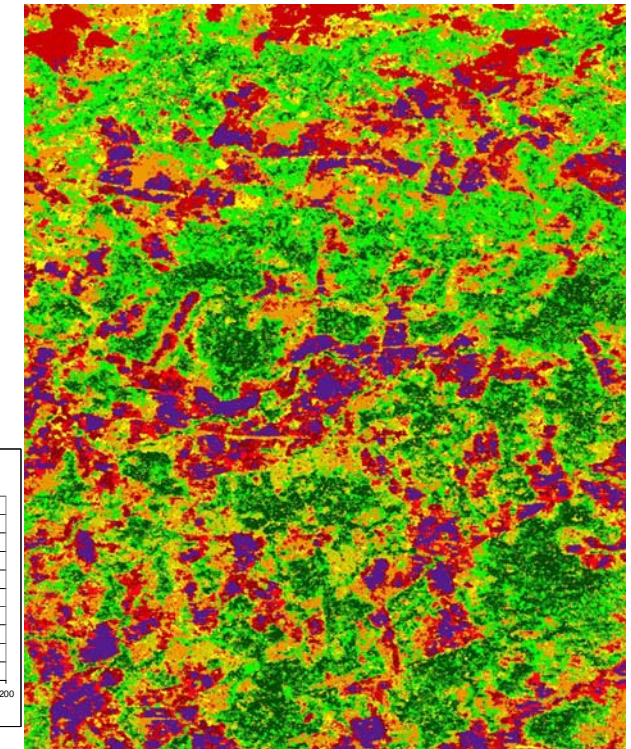
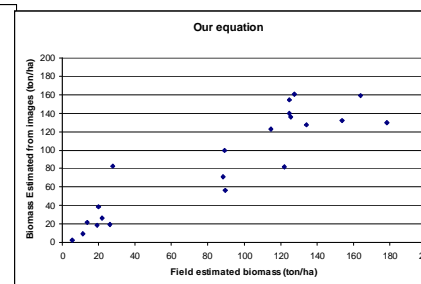
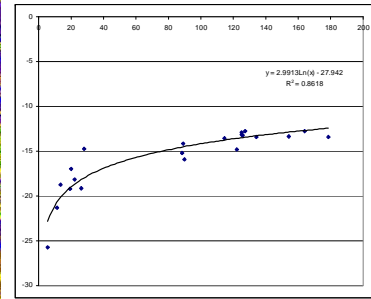
Extension Phase Proposal: 3a Biomass Mapping in the Colombian Amazon

- **Project objective(s):** Assess Alos Polarimetric data for biomass mapping, use of polarimetric data compared to FBDP. Maps will show the use of recent developed technology for biomass mapping and monitoring.
- **Project area:** Guaviare and Araracuara forest in the Colombian Amazon.
- **Outline of project plan:** Application of developed algorithms (ESA projects) and investigation on use and stability of multi-temporal data for biomass mapping for application on biomass monitoring. Study in to well surveyed areas in the Colombian Amazon. Biomass data from the field and from available maps will be use for validation.
- **Time schedule:** 3 years
- **Definition of deliverables:** Biomass map with legend for the selected study sites.
- **Data requirements:** Available polarimetric data for the study sites..
 - PALSAR polarimetric and (FBS/FBD/ScanSAR)
 - Acquisition strategy requirements (temporal frequency). All available data
 - Processing requirements (spatial resolution; processing level etc.)
- **Other issues:** National Institute for Amazonian studies (SINCHI) and Los Andes University in Bogotá as local partners for data collection and results evaluation.

Extension Phase Proposal Biomass Mapping in the Colombian Amazon



Cover class	Color	hv	Biomass algorithms		
			Ours	Thuys	Sasaans
Open	14	-26.37	1.69	3.93	7.87
	11	-22.43	6.31	7.34	18.77
	12	-21.99	7.32	7.97	33.65
	6	-20.07	13.89	11.82	40.42
Young or secondary	0	-19.30	17.95	14.14	41.03
	8	-18.63	22.46	16.74	44.07
	10	-18.31	25.03	18.24	45.79
	3	-17.59	31.83	22.36	64.35
	7	-17.55	32.24	22.62	65.55
Primary	2	-16.40	47.34	32.75	78.78
	9	-15.94	55.21	38.68	91.19
	1	-14.91	78.08	77.43	117.03
	4	-14.73	82.76	83.52	122.64
	5	-14.04	104.24	112.74	141.31
	13	-12.86	154.63	188.28	144.62



Guaviare Site

Polarimetric classification and scattering mechanisms analysis

Biomass mapping process

Marcela Quiñones, SarVision

Extension Phase Proposal: 3b

Flooding extension and frequency mapping in the Colombian Amazon

- **Project objective(s):** Use of Alos Palsar WB data for frequency flooding and flooding extension mapping. Comparison with local meteorological data for ecosystems conservation payment mechanism. Study of backscatter variation in flooding periods for the different cover types.
- **Project area:** Matavén forest in the Colombian Amazon. One of the study sites of the GSI.
- **Outline of project plan:** WB PalSAR data will be use for flooding extension mapping and frequency flooding mapping. Radar data will be compared to precipitation and meteorological data provided by the Colombian meteorological Institute (IDEAM) and use to support local communities for ecosystem conservation payment mechanism.
- **Time schedule:** 3 years
- **Definition of deliverables:** Flooding maps showing changes in extension and frequency of inundation. Image interpretation and classification will include analysis of complex areas. Data will be use as example to demonstrate the use of radar for ecosystem payment services.
- **Data requirements**
 - PALSAR mode wide beam-HH.
 - Acquisition strategy requirements. All data available (4 scenes/year)
 - Processing requirements (spatial resolution; processing level etc.)
- **Other issues:** Results will support payment mechanisms system by local indigenous communities within the GSI, in addition the National Institute for meteorological studies (IDEAM) will be introduced to the use of PalSAR Data for first time.

Marcela Quiñones, SarVision

Extension Phase Proposal Flooding extension and frequency mapping in the Colombian Amazon, Matavén area.

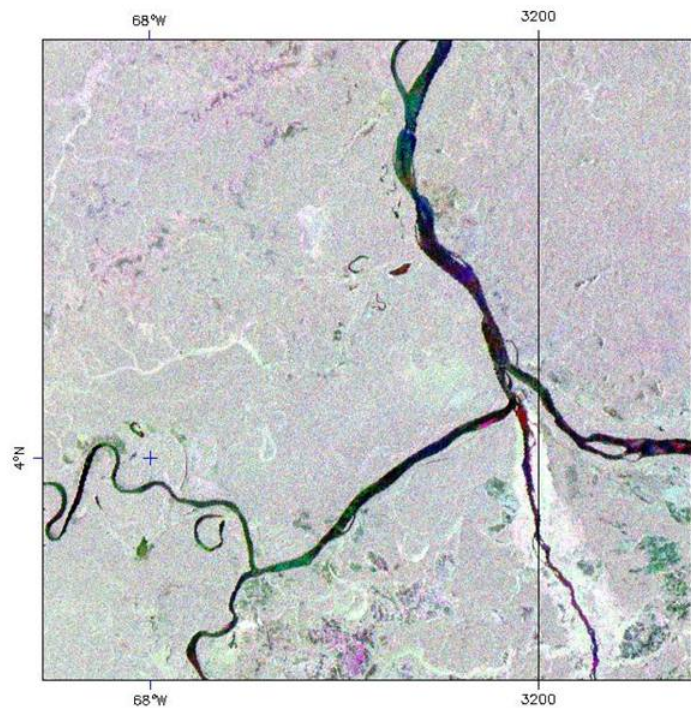
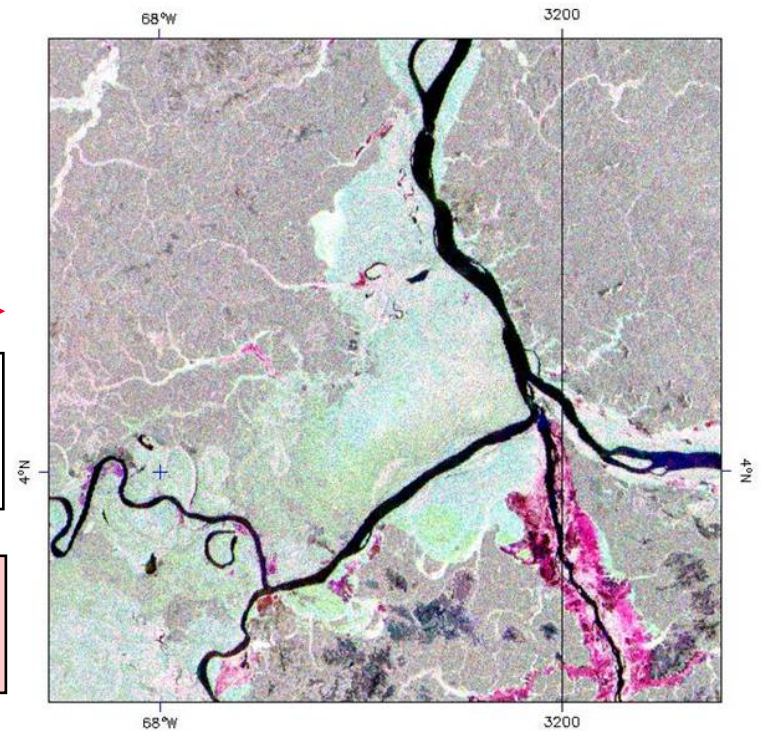


Image classification for
flooding detection and
flooding analysis

Study of complexity in the
backscatter changes in
relation to land cover type

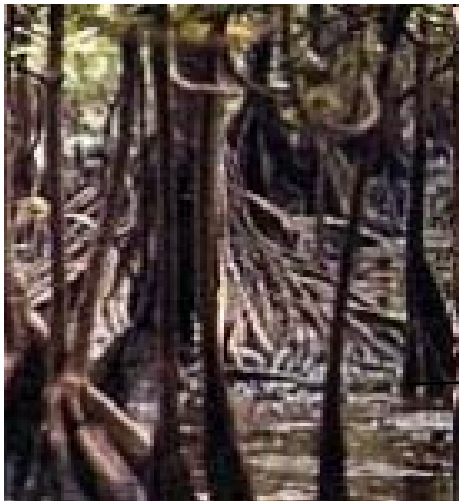


Extension Phase Proposal: 3c

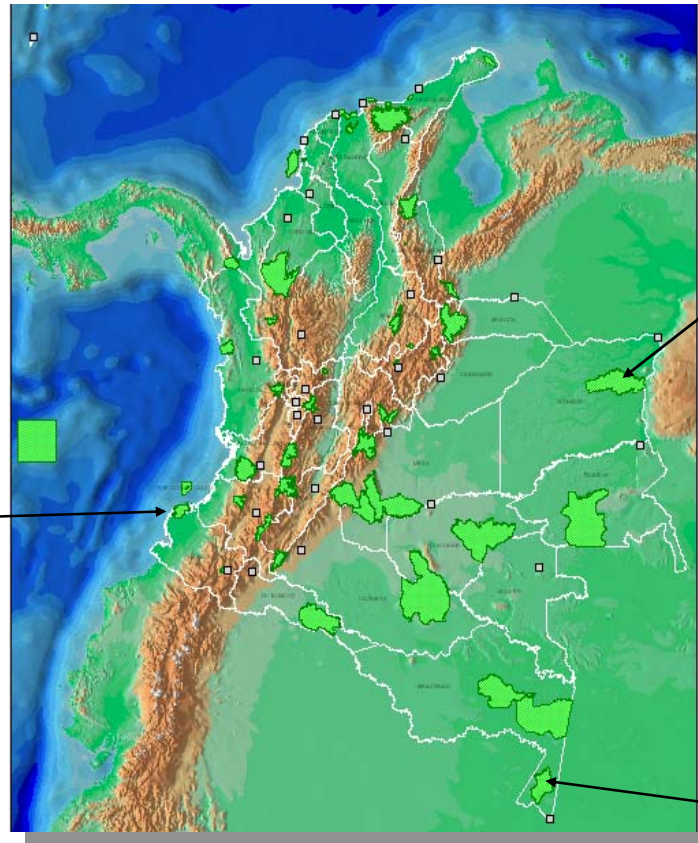
Ecosystem mapping for three Natural Parks in Colombia

- **Project objective(s):** Use of Alos Palsar FBD and FBS combined with WB for ecosystem and Landscape ecological Mapping. Combination with SRTM data for classification. Use of Maps for Biodiversity assessment and as baseline maps for Natural Park monitoring.
- **Project area:** Three Natural Parks in Colombia covering diverse ecosystems. **Amacayacu** Natural Park (Tropical Rain Forest), **Tuparro** National Park (dry and wet savannah ecosystems) and **Sanquianga** Natural Parks (Mangrove ecosystems). Eventually other Natural Parks can be included according to Natural Park System priorities.
- **Outline of project plan:** Combination of different PalSAR data and several optical systems with SRTM for detail landscape ecological mapping will set the bases for Natural Park monitoring systems in three Natural Parks in Colombia. Demonstrating will cover different landscapes and forest structures to illustrate variation.
- **Time schedule:** 3 years
- **Definition of deliverables:** Landscape ecological maps of the mentioned parks, scale 1:50.000.
- **Data requirements**
 - PALSAR mode FBD and FBS
 - Acquisition strategy requirements. All data available
 - Processing requirements (spatial resolution; processing level etc.)
- **Other issues:** Natural Park System in Colombia will be a partner in the development of the maps, giving then the possibility to get familiar with PalSAR data.

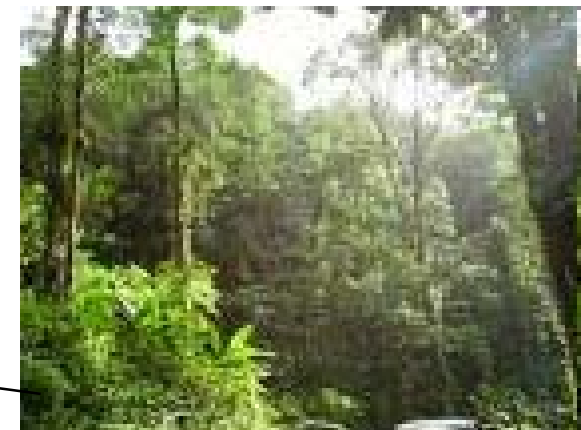
Extension Phase Proposal Ecosystem mapping for three Natural Parks in Colombia



Sanquianga



Tuparro



Amacayacu

Marcela Quiñones, SarVision

Extension Phase Proposal: 3d

Soil moisture variation study in a terrace system, for archaeological studies and ecosystem restoration in the Peruvian Andes, Peru.

- **Project objective(s):** Use of Alos Palsar FBD and FBS combined with SRTM data for studies of soil moisture changes in the Peruvian Andes Ecosystems. Study of variations will help understanding archaeological findings on land use and will provide basis for future archaeological research. Data analysis will be supported with field data and use in an ecosystem restoration project.
- **Project area:** Huandoy excavation site in the Peruvian Andes from Los Andes University in Bogotá. Field data available.
- **Outline of project plan:** PalSAR FBD and FBS Data will be used to study soil moisture variations in an archaeological site in Peru. Work will be done in combination with archaeologists and biologist working in the area understanding past land use systems to design a proper ecological restoration strategy. Radar data in combination with SRTM data is expected to give clues of ideal sites for restoration and in combination with archaeological finding data on previous land use strategies. Learning from the past to create a future.
- **Time schedule:** 2 years
- **Definition of deliverables:** Soil moisture change maps of the available dates. Application of the data for terrain analysis for ecological restoration.
- **Data requirements**
 - PALSAR mode FBD and FBS
 - Acquisition strategy requirements. All data available
 - Processing requirements (spatial resolution; processing level etc.)
- **Other issues:** Field data will be acquired by scientific team working in the area. Maps of the area are available.

Marcela Quiñones, SarVision

Extension Phase Proposal

Soil moisture variation study in a terrace system, for archaeological studies and ecosystem restoration in the Peruvian Andes, Peru.



Archeological Site and ecosystem restoration project