Products proposed at K&C Science Panel meeting #3

Boreal & Temperate Working Group
Product proposals

WG #1 - Boreal and Temperate ARD and wetlands
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Prerequisites:

- 2 interferometric pairs per year

- **Products identified by WG1 (Boreal etc.)**

1. Deforestation incl. Fire Scars (straightforward)
2. Relative Growth/Regrowth (challenging)
3. Subtle phenomena: Thinning, insect infestation, ground-fires (experimental)
4. Biomass inventory (straightforward/challenging)
5. Inundation mapping (straightforward)
6. Ground topo(dependent on PolInSAR, challenging/experimental)
7. Tree height (dependent on PolInSAR, challenging/experimental)
8. Freeze/thawing (temporal resolution not sufficient)
9. Soil moisture (temp. res. not sufficient)

Straightforward Forest-related Parameters: Deforestation, Biomass, Inundation Mapping

Scientific relevance: **high & critical**

Target end users: **ARD/Kyoto reporting, GTOS/TCO, IPCC, (national forestry administration, commercial sector?), NGOs, RAMSAR, MEA(?), GMES**

Organisational structure

- Lead organisation(s): JRC, NASA, "The Boreas-Machine",
- additional collaborators: HUT, VTT, CESBIO,...
- links to user groups: CTCD, ...

Requirements for realisation

- funding (source?): EC/GMES,
- MoU's
- anticipated problems: continuity of satellite data, coverage, revisit time, temporal decorrelation

Level of ambition

- global vs. regional: global
- one-time vs. repetitive (frequency?): repetitive
- demonstration vs. operational product: all operational

Straightforward Forest-related Parameters: Deforestation, Biomass, Inundation Mapping

Technical issues

- operational or R/D: operational
- utility of existing JERS data: yes
- importance of SAR/optical synergy: useful but not necessary
- min. system req (pol., inc.angl., #DT, spatial & radiom. resolution, etc.): see Tokyo Meeting,
- adequacy of current observation plan: current simulation results are not sufficient

Product validation

- methodology: Carbon Credit Traiding Orgs., "The Boreas-Machine", GT-GIS of SIBERIA-I, -II
- in situ networks: national forest inventories, N-American Carbon Plan, Gutman`s Siberia?, China?

Data flow

- from data take to final product: fast
- data volumes foreseen: huge
- bottlenecks: many
- proc. level from NASDA: Level 1, geo-located ground-range products

Time schedule: fast

PolInSAR Applications: Ground topogr., Tree height/Biomass

Scientific relevance: **high**

Target end users: **GTOS/TCO, IPCC, (national forestry administration, commercial sector?), NGOs, MEA(?), GMES, ARD/Kyoto reporting (multiple coverage needed)**

Organisational structure

- Lead organisation(s): JPL(Paul Siq…), NASA (Craig D.), DLR (Alberto M.)
- additional collaborators: Univ. Michigan (Pierce/Sarabandi), HUT (Hallikainen), FSU/The Boreas-Machine, MPI-BGC (Zimmermann), …
- links to user groups: CTCD, …

Requirements for realisation

- funding (source?): NASA?, EC/GMES?
- MoU's
- anticipated problems: validation of approach (sub-sampling strategy of PolINSAR to estimate extinction coefficient of dual-pol InSAR, incidence angle requirements), accommodation of baseline, temporal decorrelation, if annual repeat: continuity of satellite data, coverage, revisit time.

Level of ambition

- global vs. regional: global above 60 deg N (dependent on SRTM) for topo, globally tree height for better biomass estimations (problem: knowledge about tree species)
- one-time vs. repetitive (frequency?): one-time, as early in mission as possible essential – after that annually for ARD
- demonstration vs. operational product: demonstration/semi-operational

PolInSAR Applications Ground topography, Tree height

Technical issues

- operational or R/D: R/D
- utility of existing JERS data: limited
- importance of SAR/optical synergy: species mapping for biomass calculation from tree height (Landsat, Reiner`s geomorph. analysis)
- min. system req (pol., inc.angl., #DT, spatial & radiom. resolution, etc.): global dual-pol plus PolInSAR-subsamples, baseline equals to ca. 15 % of critical ones (i.e. ca. 1.5 km)
- adequacy of current observation plan: add PolInSar-subsamples to current plan, bottle neck in the full pol mode with 30 km swath width. A priori information of extinction coefficient is required due to temporal decorrelation.

Product validation

- methodology: airborne missions (lidar, scatterometer), ground surveys
- in situ networks: essential, e.g. GT-GIS of Sib-I and –II, TCOS Siberia, BOREAS, ..

Data flow

- from data take to final product: not operational (slow) process
- data volumes foreseen: huge
- bottlenecks
- proc. level from NASDA: level 1b geo-located SLCs, processing, inversion, distribution

Time schedule