

NEESPI SUMMIT

Helsinki Finland, May 3-4, 2007

POSSIBLE PATHWAYS for a COOPERATION with CNES and FRANCE



A pathfinder presentation by
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1A – SOME IMPORTANT CAVEATS

It should be understood that the European Space Policy at large is shared by many institutions: the European Space Agency (ESA), the national space agencies (CNES, DLR, ASI, BNSC...) several DGs of the European Commission (Research, Enterprise, JRC...) and on top of that the Ministries, acting both at national level, through the ESA Council and at the European Council of Ministries level.

As a result, an overarching consensus emerges about principles, work share, ownership, data policy... but since new initiatives often emerge tuning this consensus is a work in progress.

1A – SOME IMPORTANT CAVEATS

When it comes to such a specific issue as contributing to NEESPI:

- Overarching commonly agreed rules do apply whenever relevant;
- Within these rules, each country can have visions of its own;
- 'Grey areas' may appear, which are solved by ad hoc bona fide bilateral discussions within the SC or at a higher level if needed.
- It should be kept in mind that ESA and national space agencies may have different missions and structures than ESA or RAS. For instance, neither ESA nor CNES lead research by themselves; CNES has ad hoc partnerships within some specific labs; DLR has a quite different structure.
- So, the scientific domain can be outside their field of responsibility and/or activities – which does not preclude ad hoc interactions.

1B – An IMPORTANT CAVEAT to CAVEATS

THE ABOVE "CAVEATS" DO NOT PRECLUDE THE WILLINGNESS OF EUROPE - AND IN PARTICULAR OF CNES – TO SIGNIFICANTLY CONTRIBUTE TO NEESPI. THEY ONLY UNDERLINE THAT THIS IS NOT A STRAIGHTFORWARD WAY.

ANY DISCUSSIONS AND EFFORTS WILL BE LED AT THE PROPER LEVELS TO ANSWER POSITIVELY TO RELEVANT NEESPI ISSUES AND NEEDS.

NB - The statements that follow closely stick to the NEESPI Science Plan and to the NEESPI preliminary Terms of Reference.

2A – ‘RAW’ DATA – EO EXISTING SYSTEMS

A LIMITED SET OF EXAMPLES

- **VEGETATION SYSTEM** – On board SPOT4 & 5 (2200 km swath, 1.1 km resolution, daily coverage). Perfectly tailored to regional surveys such as NEESPI. Has been used by EC/JRC to build up the GLC 2000 digital land cover map – see further.
- **SPOT SYSTEM** – Very wide high resolution archive (some 10^7 scenes) and great observing capacity based on SPOT-2, 4 & 5 (up to 2.5m resolution for SPOT-5) . The EU-sponsored **OASIS programme** is providing European scientists (and associated teams) with marginal cost images through.

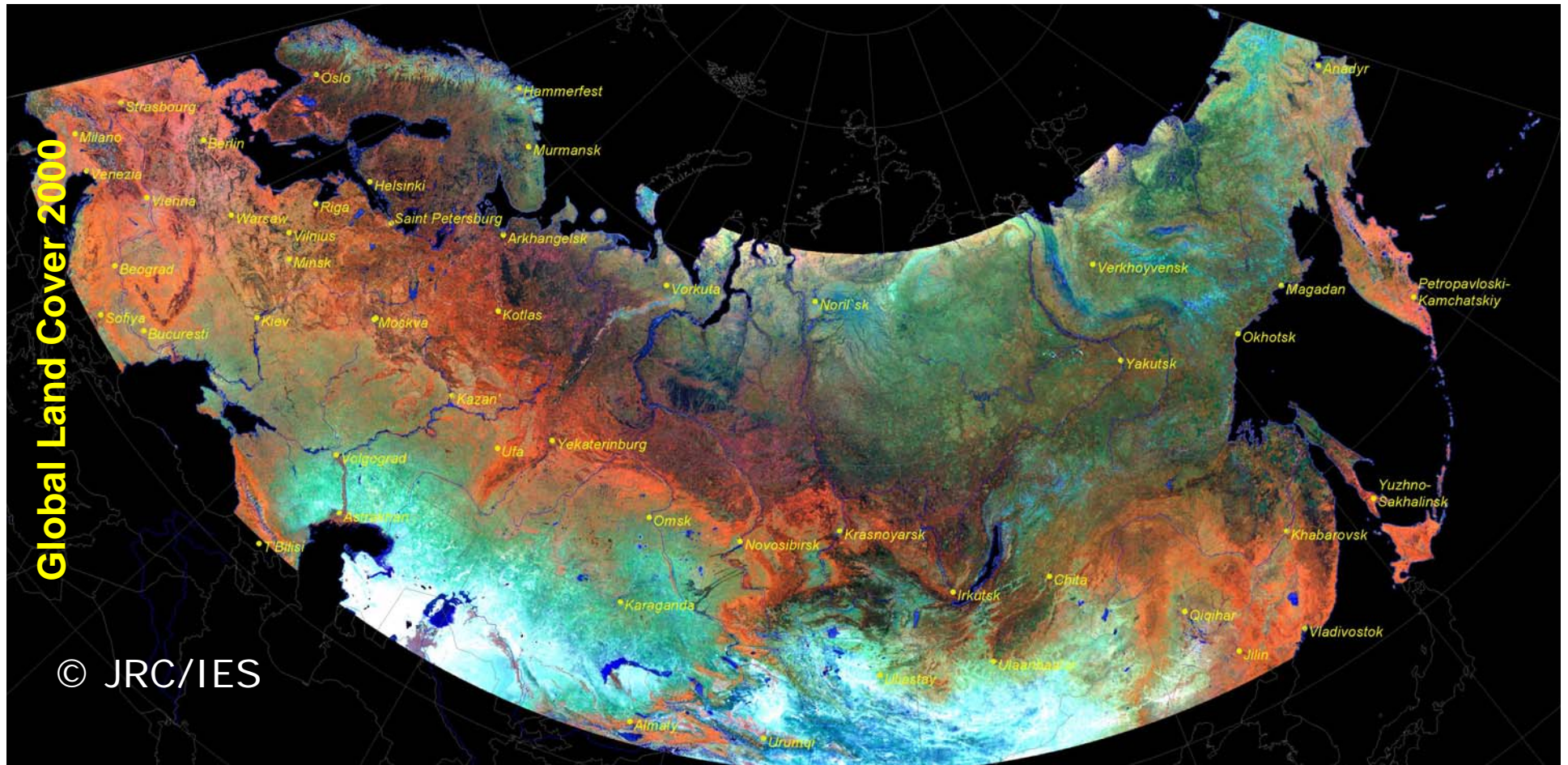
TAKE ADVANTAGE OF OASIS !!!

S. BARTALEV, A. S. BELWARD

Institute for Environment and Sustainability, EC Joint Research Centre, Italy

D. ERCHOV

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GLC 2000 is derived from SPOT/VEGETATION system by EC/JRC/IES

2A – ‘RAW’ DATA – EO EXISTING SYSTEMS

- **POLDER** instruments measure multidirectional and polarisation radiance in the visible and NIR domain. They are/were flown on board ADEOS-1, 2 and PARASOL (a component of the A-Train). POSTEL delivers land surface parameters to the POLDER Production Centre. Such products as directional albedo, NDVI, LAI, FVC, FAPAR, BDRF database are being made available.
- **DORIS HIGH ACCURACY POSITIONING SYSTEM** allows positioning ground located beacons with a few mm accuracy (geodesy, glaciers, permafrost...)
- **JASON** – A follow-on NASA/CNES venture for ocean highly accurate altimetry. Allows an accurate monitoring of mean level trends, currents ... the so-called ALTICORE project aims at using data close to the shorelines (coasts, lakes...)

2B – ‘RAW’ DATA – EO FUTURE SYSTEMS

A LIMITED SET OF EXAMPLES

- **ORFEO** is a two-faceted **SPOT high resolution follow-on programme**. Italy is in charge of **COSMO-SKYMED**, the SAR component. CNES is in charge of **Pleiades**, the optical components (two Pleiades satellites are planned in 2009 & 2011 – resolution: 0.7 m). A joint operation of the ORFEO system will allow unique complementary monitoring capacities.

2B – ‘RAW’ DATA – EO FUTURE SYSTEMS

- **VEN μ S** (2010) is a joint venture between France and Israel. The purpose of this hyper spectral satellite is to monitor every 2 days typically 100 test sites for a better understanding of ecosystems functioning at large. NEESPI areas may rank among such test sites.
- **SMOS** (2008) is an ESA satellite in which Spain and France bring a key contribution. Based upon a passive microwave 2D-interferometer technology, SMOS will allow monitoring soil wetness (quite important in NEESPI areas) and ocean salinity with a coarse resolution (35 km).

3 – FORTHCOMING PRODUCTS & SERVICES

- Key products & services that should be used by NEESPI are those derived from the **GMES** European initiative. GMES (Global Monitoring for Environment & Security) is the European participation in the worldwide monitoring and management of our planet Earth and the European contribution to **GEO**.
- **GMES** is led by ESA and the European Union (European Commission & member states).
- The first **GMES** products & services are planned to be available from 2008 through the so-called **GMES Service Elements (GSE)**.

3 – FORTHCOMING PRODUCTS & SERVICES

- **CNES supported GMES** from its very beginning, and strongly contributes to it.
- A major initiative relevant for NEESPI and initiated by CNES is the so-called **POSTEL thematic unit**.
- **POSTEL** derived products & services are deeply rooted in **GMES**.

3 – FORTHCOMING PRODUCTS & SERVICES

- Basically, **POSTEL** – first a French initiative bringing together Cnes and several research organizations - aims at providing the worldwide scientific community (and other users) with scientifically validated geocoded biophysical products (such as albedo, FAPAR, LAI...) at regional and global scales, derived from a multi-source approach.
- POSTEL has to be seen as the development phase of a “**land use and land cover**” **GSE** pushed by France, Belgium (VITO) & Portugal (EUMETSAT SAF Land).
- To-day, **POSTEL** is a portfolio of projects that contribute to the CSP and can be widely used as European and French contributions to **NEESPI**.

3 – FORTHCOMING PRODUCTS & SERVICES

Two categories of POSTEL projects can show relevant for NEESPI :

1 – POSTEL R & D PROJECTS

- **CYCLOPES** aims at developing and validating biophysical products (albedo, LAI, FAPAR, vegetation cover) from various wide-swath sensors (AVHRR, VEGTATION, POLDER, MERIS). The products proved useful to detecting and categorizing land use changes, and assessing carbon fluxes.

3 – FORTHCOMING PRODUCTS & SERVICES

1 - POSTEL R & D PROJECTS (ctd)

- **The VALERI project** aims at inter-comparing products derived from various sensors and algorithms and assessing the absolute accuracy of biophysical products delivered by the POSTEL CSP. Validation is performed through a network of *in-situ* measurements distributed over the Earth surface.

VALERI exhibits synergies with NASA/LCLUC/**NELDA** project – Contacts exist between the two teams.

3 – FORTHCOMING PRODUCTS & SERVICES

2 – GMES pre-operational projects

- **GEOLAND** is an integrated project planned to be the backbone of GMES-related operational services. It plans to prove the pre-operational capacities of two Core Services : (1) generic land cover and (2) biogeophysical parameters, divided into six downstream services among which three regional (European) services and three global services. Products include LAI, vegetation cover, water bodies, FAPAR, albedo, incoming radiance, land surface temperature & moisture, burnt areas, rainfall.

3 – FORTHCOMING PRODUCTS & SERVICES

2 – GMES pre-operational projects (ctd)

- **GLOBCOVER** aims at taking advantage of the moderate resolution, hyperspectral MERIS instrument on board ENVISAT to derive 250 m resolution land cover maps over the whole world updated on a regular basis.

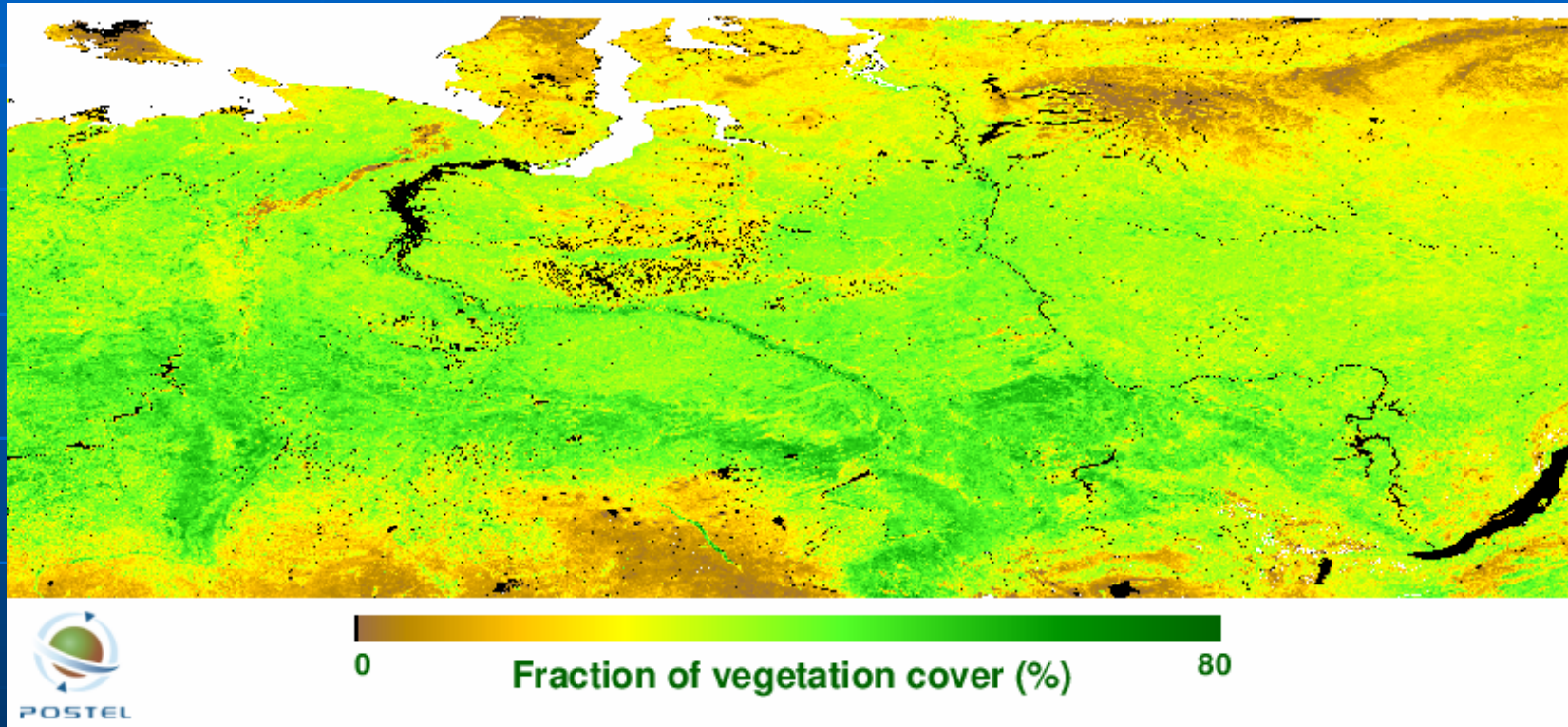
GLOBCOVER can be considered as an improved dynamic follow-on to GLC-2000. It could also have fruitful links with **NELDA**.

3 – FORTHCOMING PRODUCTS & SERVICES

POSTEL is made up of the following layers:

- Upstream: Scientific Expertise Centres (research organizations that define space missions and relevant derived products) ;
- CSP is the Core Service for biogeophysical Parameters. It develops processing chains and generates, archives & circulate products ;
- Worldwide users community (interdisciplinary studies of surface; carbon, water and energy cycles; food security management; monitoring of land cover changes)

3 – FORTHCOMING PRODUCTS & SERVICES



A Postel product: fraction of vegetation cover.
CYCLOPES project, VEGETATION sensor, July/August
2003 synthesis.

3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- CNES is promoting interdisciplinary scientific studies about relationships linking epidemiology (or human health), environment and global change. Such studies are now led in such different paces as Senegal, Argentina, China. This issue is quoted in the NEESPI Science Plan. So, setting up a NEESPI project should be considered and a proactive policy should be led.

3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- So far, Cnes has no official programme dedicated to **training and capacity building**. Nevertheless, that point is under careful consideration. Ad hoc actions are led. CNES is represented in the CEOS WG Edu. Strong links with **SCERT** do exist. So, strengthening existing channels in a proper way to contribute to NEESPI education and capacity building as emphasized by its Science Plan should be duly considered (see next point).

3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- CNES is involved in the development of the **SIRS** project – now a NEESPI mega-project – and in **ENVIROMIS/CITES** events. This has been a follow-on activity for several years, which is becoming more and more successful on the international scenery.
- CNES holds the Secretariat of the **National Committee about Global Change** and can draw scientists' attention to NEESPI issues. Some scientists – especially in Toulouse – are showing interest to some NEESPI-related issues (forests, peat bogs and C cycle...).

3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- Some 190 scientists have built up the so-called '**European DesertNetwork**' (E-DN), a 'bottom-up approach' strongly encouraged by the UNCCD Secretariat and the EC. E-DN addresses **all relevant regions in the world** and is open to all. Gerard Begni is chairing the 'Science-Policy WG'. It is suggested to scientists from the NEESPI Southern regions **to join** E-DN, while E-DN can focus on NEESPI regions and have relationship with NEESPI management structures.

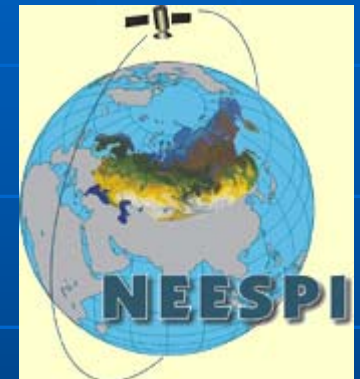
3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- CNES mission is primarily **project management** (including EU projects). It is willing to bring in-kind support to NEESPI management, including to NEESPI IPO. Internet makes such a cooperation easier.
- CNES can support at proper levels the initiative suggested by Pr. Pavel Kabat (having a joint US-EU-Russia action within the FP7)

3 – OTHER COOPRATION FIELDS TO BE DULY CONSIDERED

- Similarly to POSTEL but on a more modest scale so far, Cnes and its partners developed other thematic units: **ICARE** for aerosols and **ETHER** for atmospheric chemistry.
- **Medias-France**, in which Cnes is involved, has a wide experience in managing data and metadatabases. Indeed, Medias-France has been the gateway of NEESPI & SIRS (and SCERT) into CNES. Medias-France is also currently managing POSTEL developments.

AS A CONCLUSION ...



**There is still a lot of job to be led
by the elephant wedding guy !!!**