



# ALOS Kyoto & Carbon Initiative

## Brief (forest) summary for GlobBiomass

Ake Rosenqvist, K&C Science Coordinator

## Heritage and objectives

The ALOS Kyoto & Carbon Initiative is a JAXA-led international collaboration, forming the continuation of the JERS-1 SAR GRFM/GBFM project. **Initiated in 1996, going strong for 20+ years!**

Focus on development of (L-band) SAR applications in support information needs posed by the “4 C’s”:

- The terrestrial **C**arbon cycle science community (CO<sub>2</sub> & CH<sub>4</sub> sources and sinks);
- Multinational Environmental **C**onventions:
  - UNFCCC Paris Agreement and UN-REDD+ (Forest and Land Cover Change);
  - Ramsar Convention (wetland characteristics and disturbances);
- Environmental **C**onservation
- Climate **C**hange (glacier movements)

# Heritage and objectives

Currently 32 science teams from 16 countries.

The K&C Science Advisory Panel has supported JAXA's development of the ALOS PALSAR and ALOS-2 PALSAR-2 missions, and has pioneered the concept of [systematic acquisition strategies](#) (JERS-1 regional systematic observation plan, starting 1995, pre-dates even the 1997+ Landsat Long-term Acquisition Plan) and the use of SAR mosaics for regional-scale analysis.

3 Thematic focus areas: [Forestry](#), [Wetlands](#), [Glaciers](#) (& previously Deserts)



## Forest Theme projects

Christian Thiel & Christiane Schmullius, FSU-Jena, Germany

**Vegetation Cover and Biomass Mapping in Various Climates**

Maurizio Santoro, Gamma Remote Sensing, Switzerland

**Coupling radar-based estimates of forest information with biosphere models for improved carbon flux estimation**

Thuy Le Toan, Stéphane Mermoz, Alex Bouvet, CESBIO France

**Forest Cover Change and Biomass Mapping**

Shaun Quegan & João Carreira, University of Sheffield U.K.

**Measuring above-ground biomass and its changes over Brazilian tropical secondary forests and savanna woodlands (Cerrado)**

Richard Lucas, Pete Bunting, Ake Rosenqvist, Aberystwyth University, U.K.

**Mapping global distribution and changes of mangroves (Global Mangrove Watch)**

Johan Fransson, Univ. of Agricultural Sciences, Sweden

**Retrieval of forest biomass and biomass change with spaceborne SAR**

## Forest Theme projects

Renaud Mathieu, CSIR, South Africa

**Mapping woody fraction cover and biomass in southern Africa**

Josef Kelldorfer, Earth Big Data, USA

**Land Cover Change and Forest Carbon Tracking with L-Band SAR and Optical Time Series**

Dirk Hoekman, Wageningen University, Netherlands

**Wide area forest monitoring and biomass stratification in Insular SE Asia and Guiana Shield**

John Armston, University of Queensland, Australia

**Detection of Biomass and Structural Change**

Paul Siqueira, Univ. Massachusetts, USA

**Use of short-period ALOS-2 observations for vegetation characterization & classification**

Francesco Holecz, sarmap, Switzerland

**“TransparentForests”**

## Forest Theme projects

Kostas Papathanassiou, DLR, Germany

**ALOS-2 PALSAR-2 & TanDEM-X for Forest Disturbance & Degradation Mapping**

Humberto de Mesquita, Brazilian Forest Service, Brazil

**Forest Structure to Map of Forest Types in Brazil**

Trix Estomata, Don De Alban, Anji Monzon, GIZ, Philippines

**Utilising L-Band SAR Data for Natural Resource Management in the Philippines**

Wolf Forstreuter & Johannes Reiche, Secretariat of the Pacific Community, Fiji

**Improving Forest and Carbon Monitoring in the Pacific Island Region**

Joaquim Macuacua, National Directorate of Lands and Forestry, Mozambique

**National Forest Monitoring System For REDD+ in Mozambique**

Anthony Milne, Horizon Geoscience, Australia

**Using multi-temporal and multi-channel ALOS PALSAR-2 to investigate forest and land cover changes in Papua New Guinea**

## Forest Theme projects

Yumiko Uryu, WWF, Indonesia

**Identifying industrial go and no-go zones and monitor industrial practices through PALSAR-based land cover and carbon stock mapping in Sumatra and Borneo**

Anthea Mitchell, University of New South Wales, Australia

**Forest cover and land use mapping in Tasmania**

Hamdan Omar, Forest Research Institute Malaysia (FRIM), Malaysia

**Updating Forest Cover and Assessing Aboveground Biomass in Various Tropical Forest Ecosystems in Malaysia**

Orbita Roswintarti, LAPAN, Indonesia

**Forest Mapping in North Sumatra, Indonesia**

Bill Salas & Nathan Torbick, Applied Geosolutions, USA

**Operational rice mapping and forest structure assessment to support the 3Cs**

Edson Sano, IBAMA, Brazil

**Detecting new deforested areas in the Brazilian Amazon**



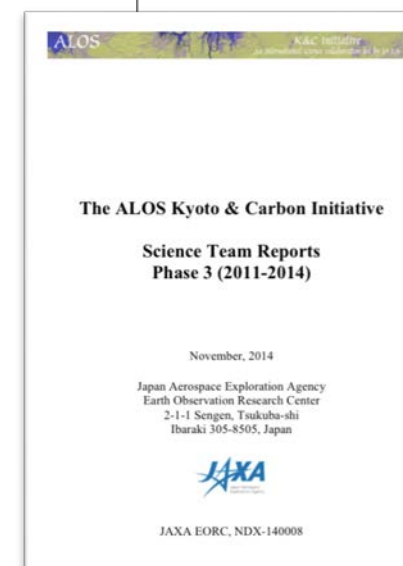
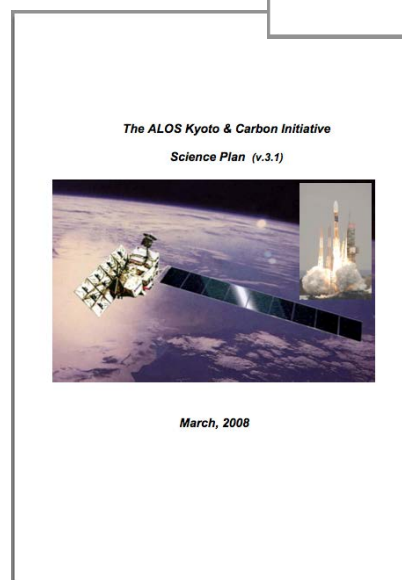
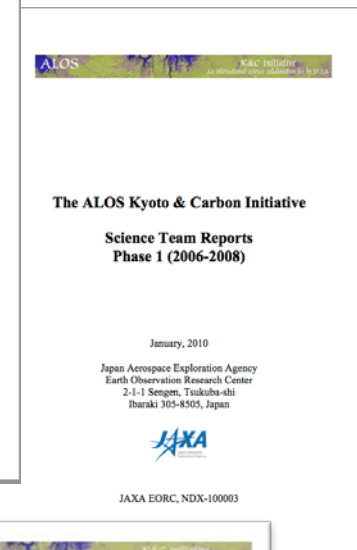
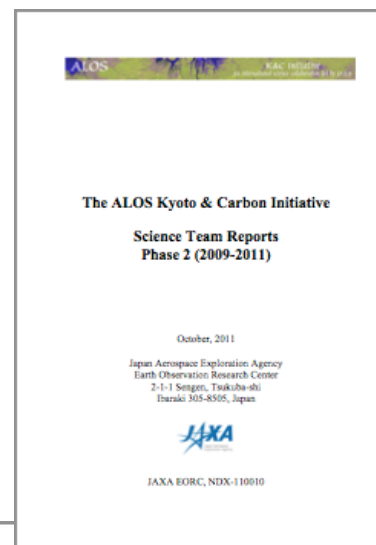
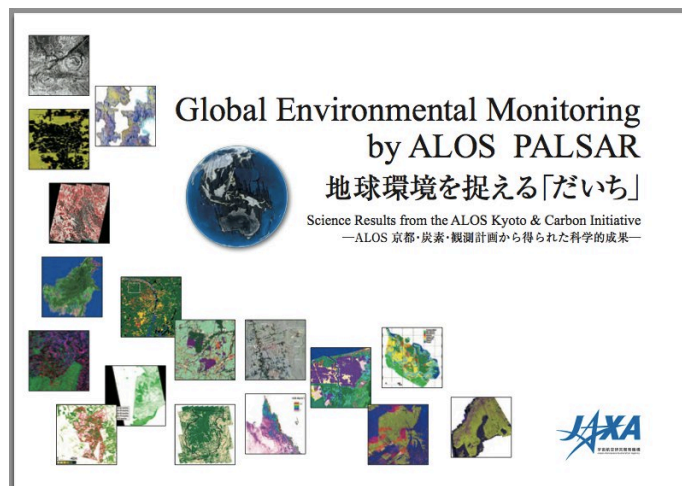
## K&C Reports and publications

*K&C Science Team Reports **Phase 1** (Jan 2010, 230 pp)*

*K&C Science Team Reports **Phase 2** (Oct 2011, 250 pp)*

*K&C Science Team Reports **Phase 3** (Nov 2014, 450 pp)*

*K&C Booklet*



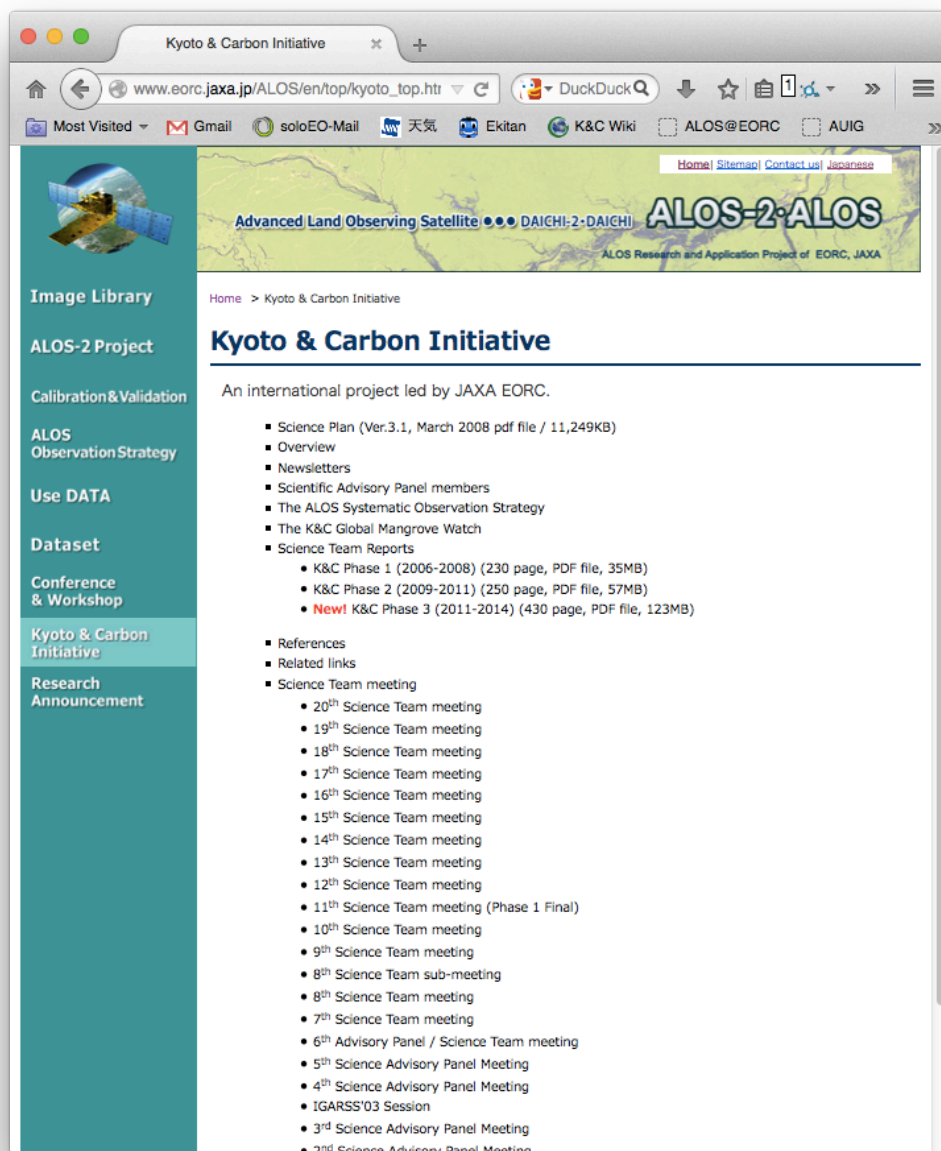
Download at [http://www.eorc.jaxa.jp/ALOS/en/top/kyoto\\_top.htm](http://www.eorc.jaxa.jp/ALOS/en/top/kyoto_top.htm)



JAXA EORC  
K&C Homepage

- Agendas and presentation material available from all previous K&C Science Team meetings (KC#1 – KC#23)
- PALSAR and PALSAR-2 systematic observation strategy (BOS)
- JAXA 25m mosaics

[http://www.eorc.jaxa.jp/ALOS/en/top/kyoto\\_top.htm](http://www.eorc.jaxa.jp/ALOS/en/top/kyoto_top.htm)

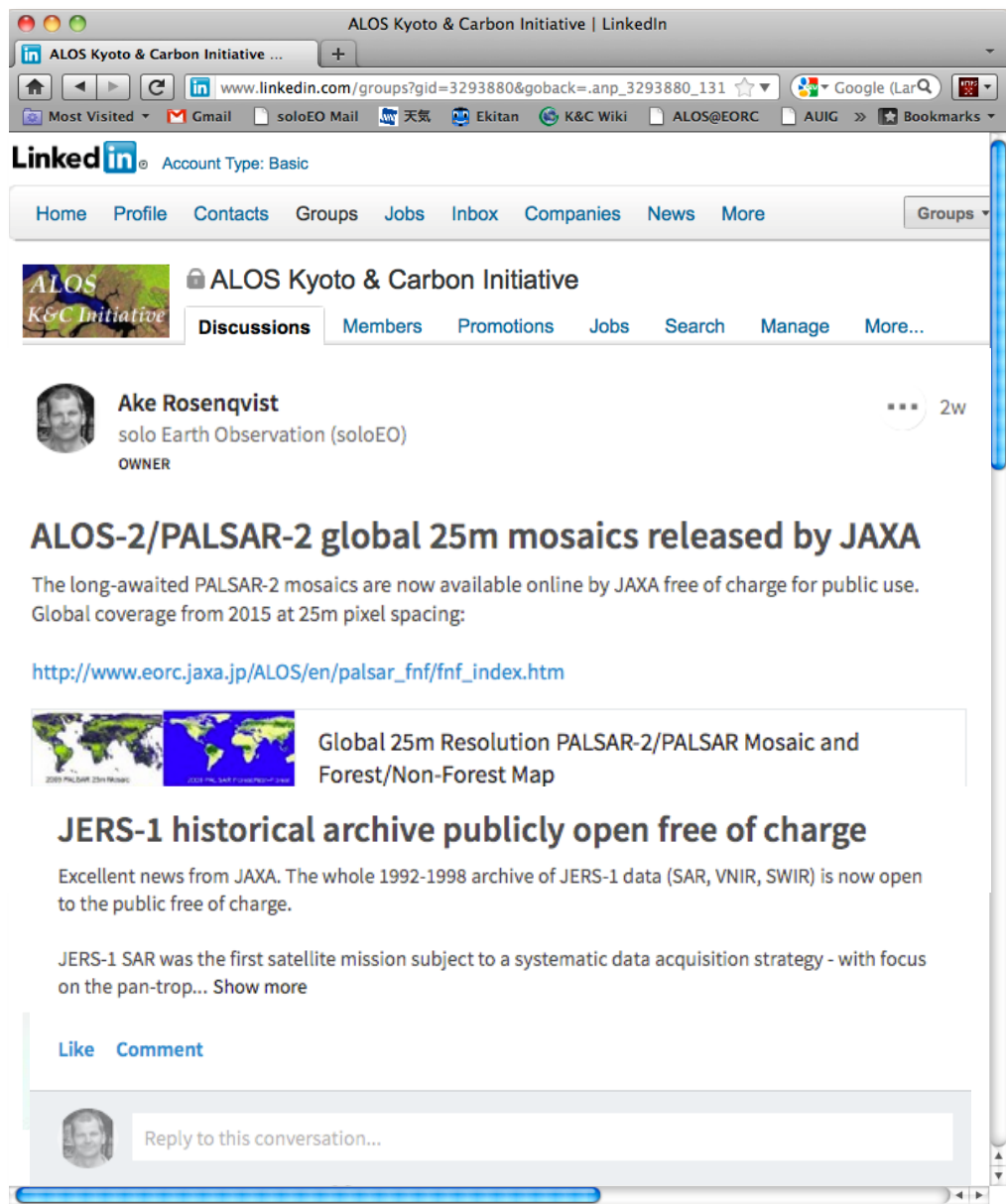


JAXA EORC  
Mosaic HomepageGlobal 25 m resolution  
mosaics online

- PALSAR 2007 – 2010
- PALSAR-2 2015 – 2016
- FBD image data

[http://www.eorc.jaxa.jp/ALOS/en/palsar\\_fnf/fnf\\_index.htm](http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/fnf_index.htm)

The screenshot shows a web browser window with the URL [www.eorc.jaxa.jp/ALOS/en/palsar\\_fnf/fnf\\_index.htm](http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/fnf_index.htm). The page features a header with the ALOS-2 ALOS logo and navigation links. A left sidebar contains a menu with items like 'Image Library', 'ALOS-2 Project', 'Calibration&Validation', 'ALOS Observation Strategy', 'Use DATA', 'Dataset', 'Conference & Workshop', 'Kyoto & Carbon Initiative', and 'Research Announcement'. The main content area is titled 'New global 25m-resolution PALSAR mosaic and forest/non-forest map (2007-2010) - version 1'. It includes a '1. Summary' section with text about the data collection and processing by JAXA, and a figure showing four global maps (a, b, c, d) illustrating the forest/non-forest distribution.



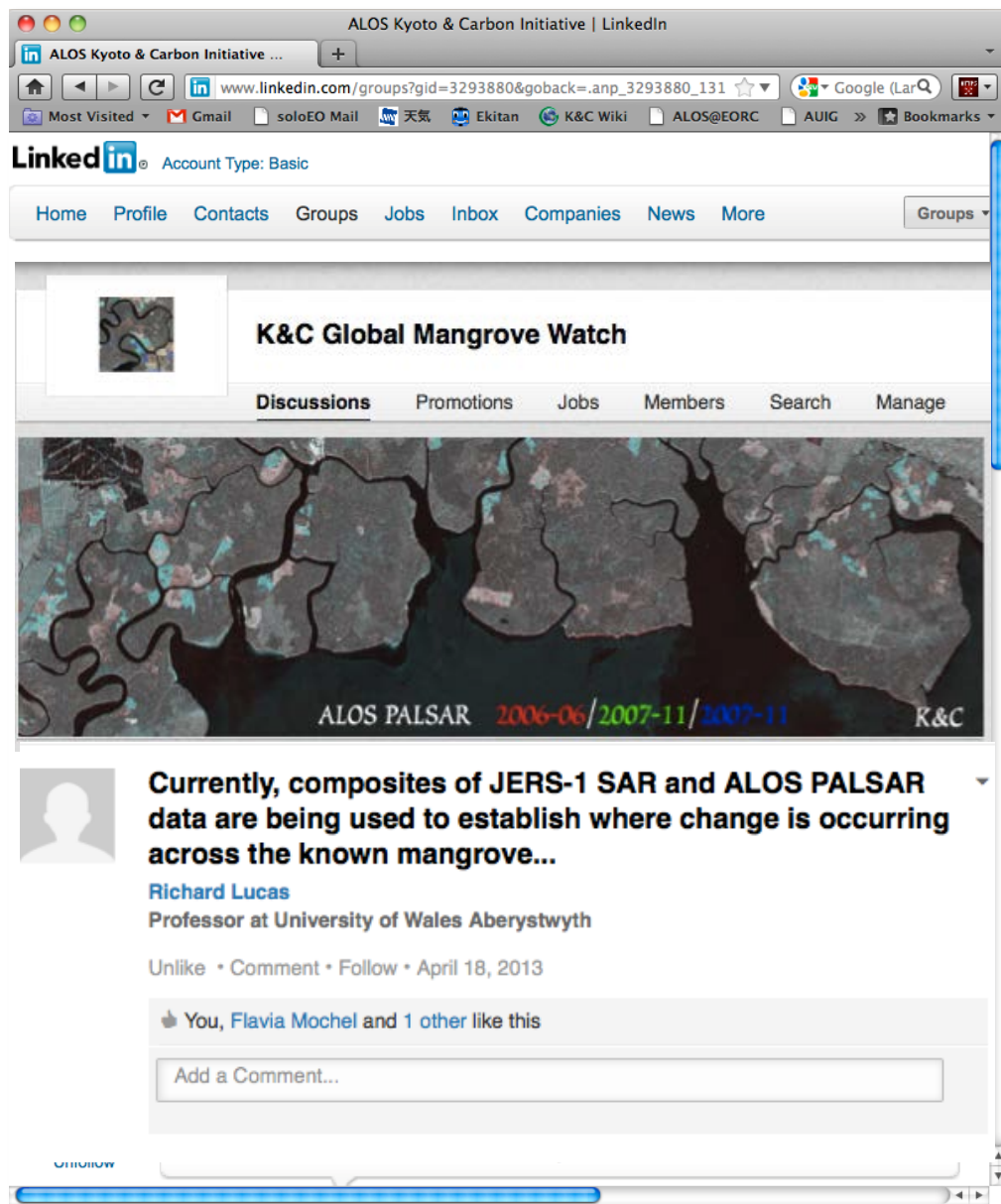
Interest group on the [LinkedIn](#) network with news on publications and other events.

Aim to disseminate K&C info to broader community.  
~250 members

Group name:  
**ALOS Kyoto & Carbon Initiative**

Request membership directly at group page at  
<http://www.linkedin.com>  
OR send email to  
[ake.rosenqvist@soloEO.com](mailto:ake.rosenqvist@soloEO.com)





Group name:

**K&C Global Mangrove Watch**

Primarily for GMW project related information, but increasing interest from the public.

Request membership directly at group page at

<http://www.linkedin.com>

OR send email to

[ake.rosenqvist@soloEO.com](mailto:ake.rosenqvist@soloEO.com)



## K&C Wiki

Blog for K&C members

MEETINGS

THEMES

K&C PUBLICATIONS LIBRARY

BACKGROUND



## K&C Publications Library

Publications relating to research undertaken, directly or indirectly, within the framework of the ALOS Kyoto & Carbon Initiative and the JERS-1 Global Rain Forest and Boreal Forest Mapping (GRFM/GBFM) project (as of Dec 2015, not comprehensive).

### 2015

Chapman, McDonald, Shimada, Rosenqvist, Schroeder and Hess. *Mapping Regional Inundation with Spaceborne L-Band SAR*. Remote Sensing, 2015, Vol. 7, 5440-5470. Doi:10.3390/rs70505440

Gardner, RC, Barchiesi, S, Beltrame, C, Finlayson, CM, Galewski, T, Harrison, I., Paganini, M, Perennou, C, Pritchard, DE, Rosenqvist, A, Walpole, M. *State of the World's Wetlands and their Services to People: A compilation of recent analyses. Ramsar Briefing Note No. 7. 2015. Gland, Switzerland: Ramsar Convention Secretariat.*

Hoekman D. and Reiche, J. *Multi-model radiometric slope correction of SAR images of complex terrain using a two-stage semi-empirical approach*. Remote Sensing of Environment, 2015, Vol. 156, pp. 1-10.

## K&C reference Library on the K&C Wiki

Library of references to papers  
relating to K&C and  
GRFM/GBFM research

130+ references & PDFs from  
Science Team 1996–2017

<https://kcwiki.wordpress.com/>

## Summary

- Long-running SAR science programme uninterrupted over 20 years (first GFRM meeting 1996, now 30+ meetings)
- Supporting International **C**onventions, Environmental **C**onservation and **C**arbon Cycle and **C**limate Change (4 Cs)
- Engaging an international team of world-leading SAR scientists
- Pioneering systematic acquisition planning (JERS - regional, ALOS/ALOS-2 global) - currently accepted as standard for most new SAR missions
- Introducing SAR mosaics as a tool for regional-scale data analysis and spreading utilisation of SAR data beyond the SAR-geek community (=us!)
- GRFM/GBFM/K&C programmes have resulted in 130+ publications. Available for download at K&C Wiki
- Presentation material from all K&C meetings available at K&C [www](#)
- K&C Science Team reports and booklet also available at K&C [www](#)