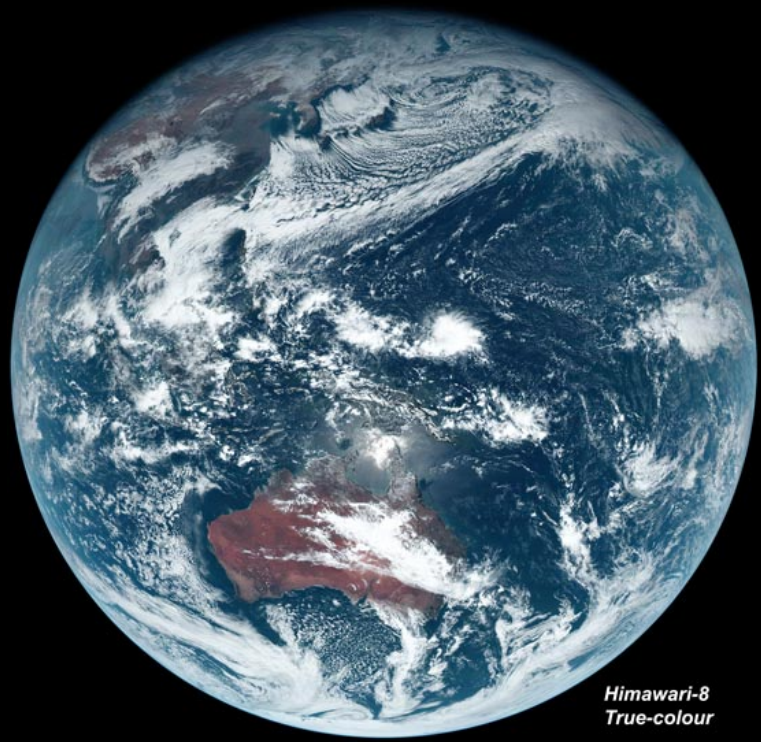
Japan Australia workshop on Non-Meteorological applications for Next Generation Geostationary Satellites: 25-26 August 2015

Agnes Lane, Ian Grant (Bureau of Meteorology)
Thomas Schroeder (CSIRO)
Nobuyoshi Fujimoto, Michihiro Koide (JAXA)
Toshiyuki Kurino (JMA)
Stephen Ward (Symbios Communications)



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A Japan - Australia collaboration

There is a need and opportunity to make the most of Japan's Himawari-8 satellite and Australia and Japan's applications capabilities.

To initiate inter-agency collaboration on the development of non-meteorological GEO products a joint workshop was held in Brisbane 25-26 Aug 2015, Australia.

Main workshop focus was on developing "application teams" across land, marine and atmosphere domains and to develop a non-met product catalogue.

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Japan Australia workshop on Non-Meteorological applications for Next Generation Geostationary Satellites: 25-26 August 2015

- Attended by 50 people from:
  - JAXA
  - JMA
  - Chiba University
  - Tokai University
  - CSIRO
  - Bureau of Meteorology
  - Geoscience Australia
  - Symbios Communications
  - Department of Environment
  - Curtin University
  - Charles Darwin University
  - University of Queensland
  - University of Southern Queensland
  - Wollongong University
  - James Cook University
  - University of Melbourne
  - Dept. of Science Information Technology and Innovation

Ecosciences Precinct
Brisbane ,Australia

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Breakout session: **Atmosphere** (1)

Key products: aerosol and solar radiation. Lower priority: total column ozone and trace gases (SO2, CO2).

Retrievals over land from an advanced GEO are challenging and new. Will need to support the development and evaluation of multiple algorithms before choosing an approach for operational use.

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Breakout session: **Atmosphere** (2)

Future users:

- Aerosol (including smoke) as an input to air quality monitoring and forecasting systems run in Australia by the BOM/CSIRO and by universities.
- Initialisation and validation of BOM smoke dispersion model.
- Assimilation of aerosol into atmospheric modelling systems such as SPRINTARS (Kyushu U) and possibly internationally such as the European MACC system.
- Validation of aerosol output from models such as MACC (needed by BOM).
- Dust aerosol monitoring is a high priority in east Asia and Japan, and in Australia the NSW Department of Environment and Heritage would use it for air quality and as an indicator of land condition.
- The JAXA supported SAFE project has an interest in air pollution.
- Geoscience Australia would use an operational stream of BRDF model coefficients resulting from joint aerosol and surface reflectance retrieval, and potentially the aerosol product, in the Landsat processing.
- Total column ozone at subdaily time resolution is of interest for air quality (troposhere, urban, e.g. U Melbourne) and stratospheric dynamics (specific users to be identified).

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Breakout session: **Land**

Key products: surface Reflectance products with geometric correction, vegetation parameters, cloud mask information, pixel quality metrics, land surface temp, dynamic tracking of fire spread and associated modeling, real time flood warning.

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Breakout session: **Oceans** (1)

Key products:

Water-leaving radiance, reflectance
Total Suspended Matter (TSS)
Chlorophyll-a
Diffuse attenuation coefficient (Kd)
Particle backscattering
Photosynthetically available radiation (PAR)
Mapping extent of coastal flood plumes
Algal bloom detection
Sea Surface Temperature (SST)

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Breakout session: **Oceans** (2)

Potential future end users:

- Great Barrier Reef Marine Authority, e.g. for monitoring water quality (WQ)
- eReefs dashboard users, e.g. linking WQ with Crown of Thorns outbreaks
- James Cook University , e.g. for ecosystem health assessments understanding and river outflows

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Outcome: Detailed catalogue of potential products

http://geoapplications.org/

Ocean

Coordination: Hiroshi Murakami (JAXA), Thomas Schroeder (CSIRO)

Product & Advisory Leads: **(1)** David Antoine (Curtin University), **(2)** Leon Majewski (BoM), **(3)** Hiroshi Murakami (JAXA), **(4)** Thomas Schroeder (CSIRO), **(5)** Larissa Valerio (JCU)

Product/Application	Algorithm type	Developing Institution	Estimated resources	Currently funded	Dependencies	Potential end users
Water-leaving radiance Remote Sensing Reflectance	Artificial Neural Network	CSIRO (4) JCU (5)	0.3 FTE	Yes	Validation data Cloud masking algorithm Glint masking algorithm Glint correction algorithm	GBRMPA BoM CSIRO JCU
	Iterative coupled atmosphere-ocean inversion model	CU (1)	TBD	No		

Land

Coordination: Yoshiaki Honda (Chiba University), Koji Kajiwara (Chiba University), Luigi Renzullo (CSIRO)

Product & Advisory Leads: **(1)** Tom Cudahy (CSIRO), **(2)** Ian Grant (BoM), **(3)** Yoshiaki Honda (Chiba University), **(4)** Koji Kajiwara (Chiba University), **(5)** Tim McVicar (CSIRO), **(6)** Masao Moriyama (University Nagasaki), **(7)** Norman Mueller (GA), **(8)** Luigi Renzullo (CSIRO), **(9)** Peter Scarth (UQ), **(10)** Medhavy Thankappan (GA), **(11)** Catherine Ticehurst (CSIRO), **(12)** Tom Van Neil (CSIRO)

Product/Application	Algorithm type	Developing Institution	Estimated resources	Currently funded	Dependencies	Potential end users
Land Surface Temperature & Emissivity	SWA e.g. adapted from GOES-ABI	CSIRO (with NOAA) (8)	0.3 FTE	No	Solar zenith, view zenith, cloud mask, land mask, precipitable water, water vapour profile,	BoM CSIRO JMA
	Semi-analytical	Nagasaki University (6)	0.2 FTE (TBC)	Yes (partially)		

Atmosphere

Coordination: Takashi Nakajima (Tokai University), Ian Grant (BoM)

Product & Advisory Leads: **(1)** Ian Grant (BoM), **(2)** Michael Hewson (UQ), **(3)** Atsushi Higuchi (Chiba University), **(4)** Fuqin Li (GA), **(5)** Takashi Nakajima (Tokai University), **(6)** Teruyuki Nakajima (University of Tokyo, JAXA), **(7)** Hideaki Takenaka (University of Tokyo, JAXA), **(8)** Yi Qin (CSIRO), + Japan TBD

Product/Application	Algorithm type	Developing Institution	Estimated resources	Currently funded	Dependencies	Potential end users
Aerosol optical depth Aerosol type Ångström exponent Surface reflectance BRDF Cloud mask (BoM only)	CSIRO GEO-LEO Algorithm (physical model via look-up tables)	CSIRO (8)	0.2 FTE	TBD	Validation data Cloud masking (algorithm or product)	CSIRO GA BoM NSW DEH JMA MOE
	MAIAC Algorithm (physical model via look-up tables)	BoM (with NASA) (1)	0.2 FTE + $15k	TBD		
	Deep-Blue (physical model via look-up tables)	UQ (with NASA) (2)	1 FTE	If DECRA		

Japan-Australia collaboration framework now in place

Next Steps …

- Identify funding opportunities to develop products

  Only ~50% of proposed products are currently funded!
- Progress implementation of funded products
- Hold annual workshop to exchange information and progress across all domains
- Expand collaboration framework to wider Asia-Pacific region

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A major initiative under the Australian Chairmanship year of CEOS.

The outcomes envisioned for the study are:

1) a report which identifying future GEO and LEO mission and instrument plans of relevance to understand the scope and scale of the topic;
2) a report which inventories relevant non-meteorological GEO algorithm and application initiatives and plans being undertaken by CEOS and related agencies, building on the Japan-Australia bilateral effort initiated in 2015 (see www.geoapplications.org) and consider whether further algorithms are required;
3) A report which assesses and prioritises the various GEO and GEO-LEO combined applications and algorithms for coordination through CEOS;
4) a report on lessons from the early collaboration on non-met GEO algorithms resulting from the Japan-Australia bilateral efforts;
5) a report identifying key issues and opportunities, including in the specification of requirements for relevant future missions and instruments;
6) a report listing recommendations for the way forward for CEOS and its agencies.

Initiate Task Team under CEOS to assess the potential of synergistic GEO-LEO approaches

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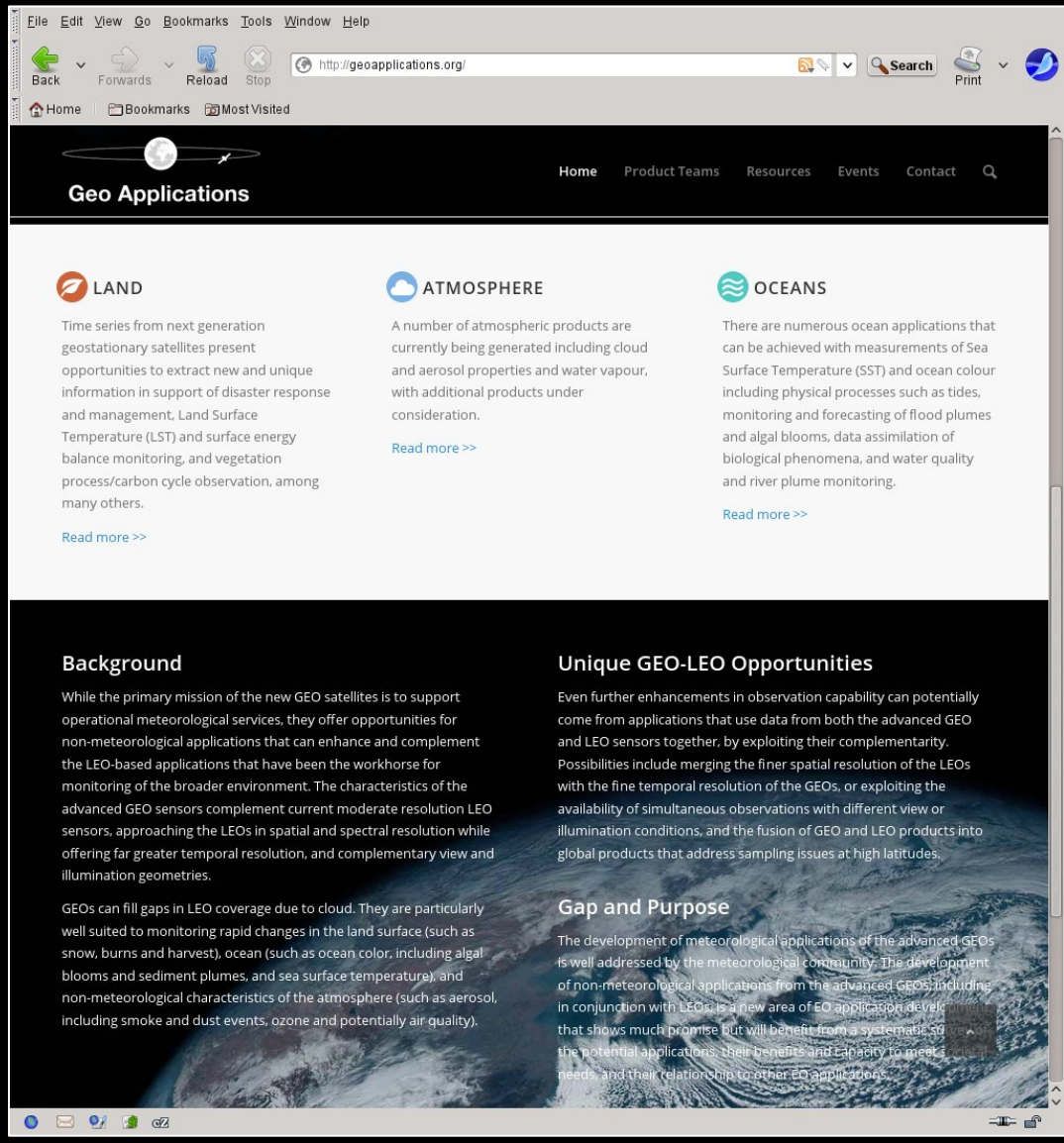
More information at:
http://geoapplications.org/

Sign up to the land, atmosphere or oceans list to hear the latest news and developments



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