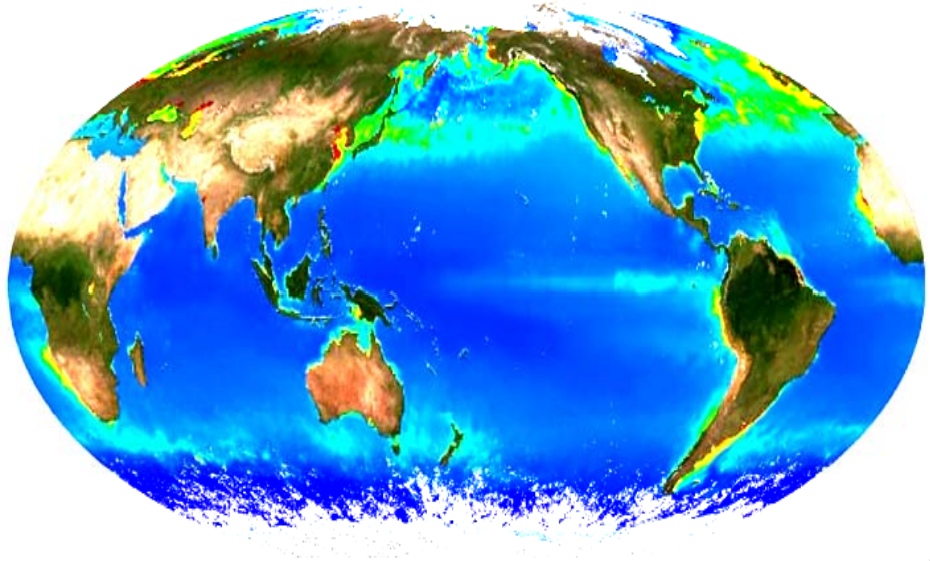
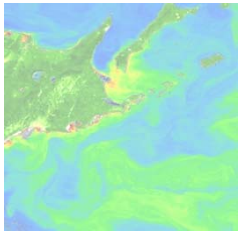
A Possible Global Partnership between ESA CoastColour Project and JAXA Global Climate Observation Mission (GCOM)

H. Murakami, T. Hirata and SGLI/GCOM Ocean Science Team





This presentation attempts to answer the following questions

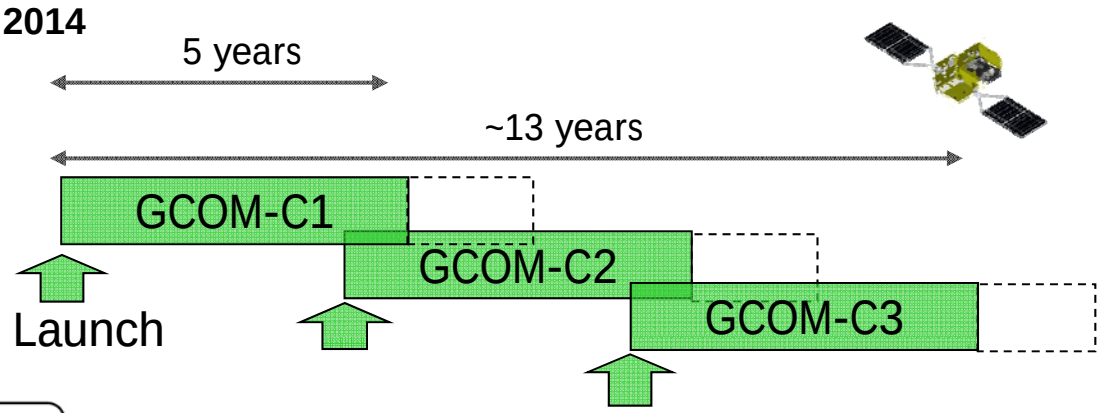
Q1. Are you able to collaborate with the Coast Colour project?

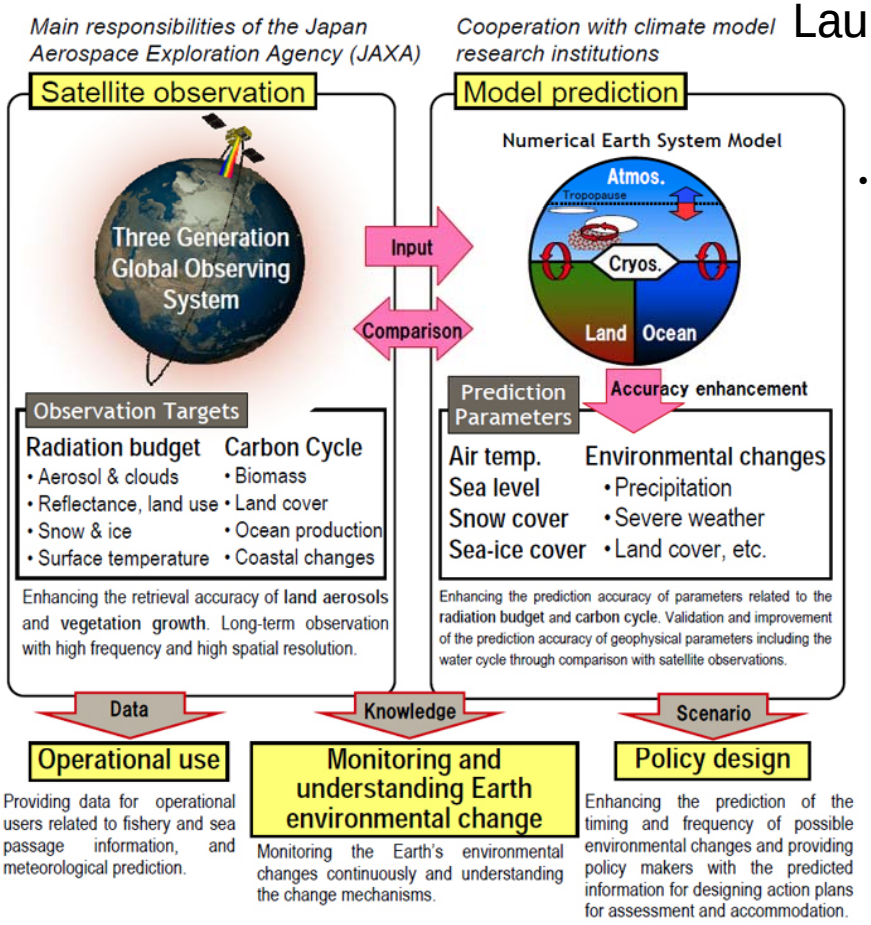
(participation in round-robin, contribution of in situ data for validation of products in your area, others?)

Q2. What aspects of CoastColour project are most important for your applications and interests (regional coverage, error specification, error reduction, type of products offered, high spatial resolution, others)

Global Climate Observation Mission (GCOM)

GOSAT (CO_2)
EarthCare [with ESA]
(Cloud &Aerosols)
TRMM
(Rain)
AMSR-E [with NASA]
(Sea Ice, Soil Moisture)
GCOM-W
(Water Vapour, SST)
GCOM-C
(Carbon & Radiation,OC, SST)



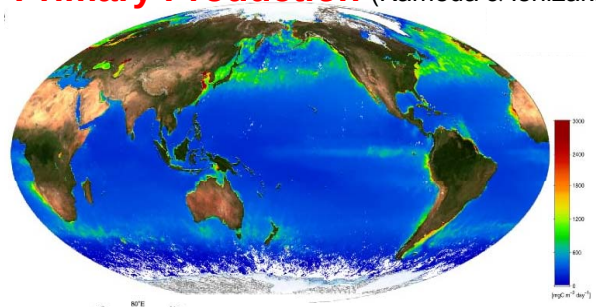


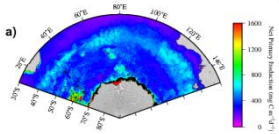
- **Ocean colour** (NWLR, ACP, PAR, CHLA, SS, CDOM, IOPs, PFTs, red tide, ONPP, EZD):
  - ✓ Modeling of ocean biological process/state and in-water optical characteristics
  - ✓ Contribution to carbon cycle study and ecosystem models

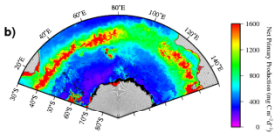
Global Warming
Ocean Acidification
Biodiversity
etc

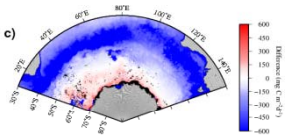
Global Change Observation Mission (GCOM-C)

Primary Production (Kameda & Ishizaka, JO, 2005)





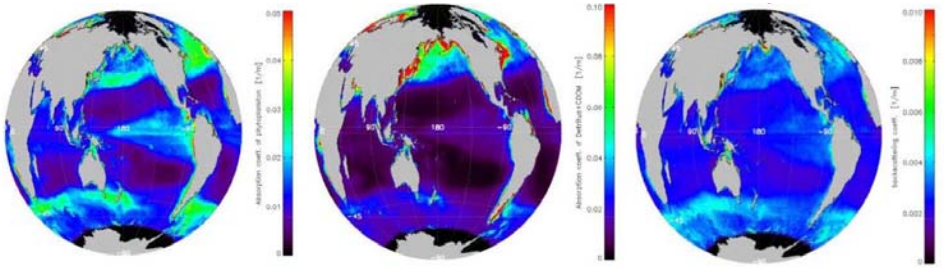




a) a_{ph}-based VGPM
b) Original VGPM
c) Difference between a) and b).
(Hirawake et al., in review)

Inherent Optical Properties (Smyth et al., AO, 2006)

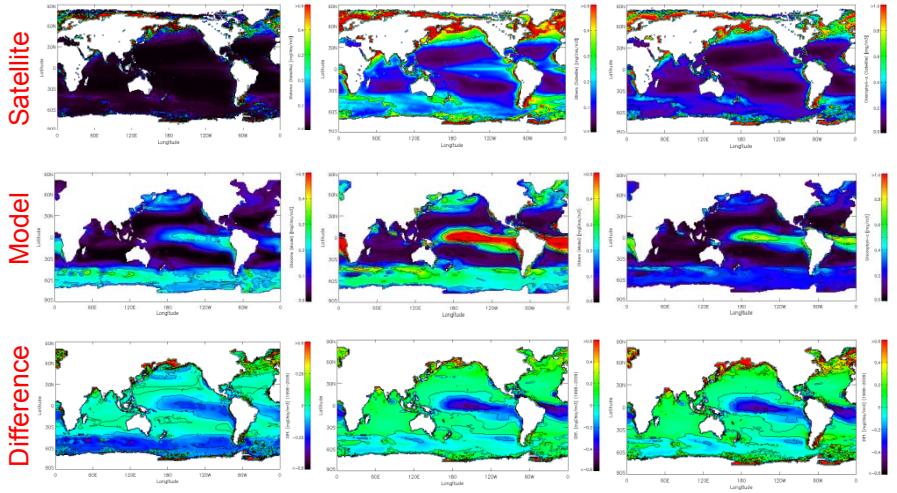
a_{ph} a_{d+CDOM} b_b



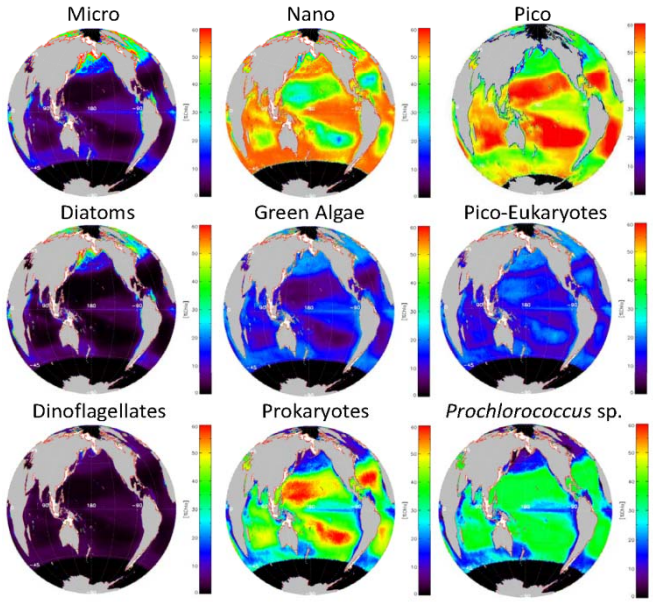
Satellite-Model (Hirata et al., in prep.)

Diatoms Others TChla

Satellite / Model / Difference



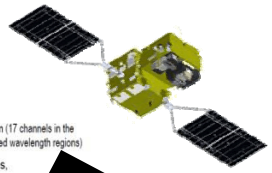
PFTs (Hirata et al., 2010)

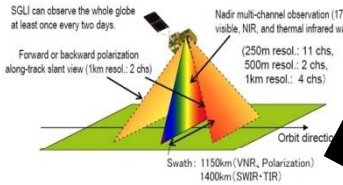


Sounds like the ESA Climate Change Initiative (CCI) ?

GCOM-C carries Second generation GLobal Imager (SGLI) with 250m spatial resolution

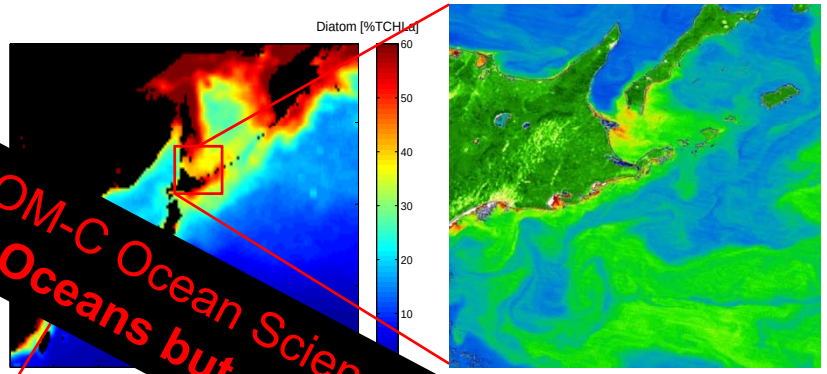
Coastal applications





	Channel	Center Wavelength	Band width	
		VNR, SWI: nm TIR: μm		m
Non-polarization Channel	VN1	380	10	250
	VN2	412	10	
	VN3	443	10	
	VN4	490	10	
	VN5	530	20	
	VN6	565	20	
	VN7	673.5	20	
	VN8	673.5	20	
	VN9	763	12	1000
	VN10	868.5	20	250
	VN11	868.5	20	
Polarization Channel	P1	673.5	20	1000
	P2	868.5	20	
SWI Channel	SW1	1050	20	1000
	SW2	1380	20	
	SW3	1630	200	250
	SW4	2210	50	1000
TIR Channel	T1	10.8	0.74	500
	T2	12.0	0.74	

ADEOS-II/ ***GLI*** 250m channels.

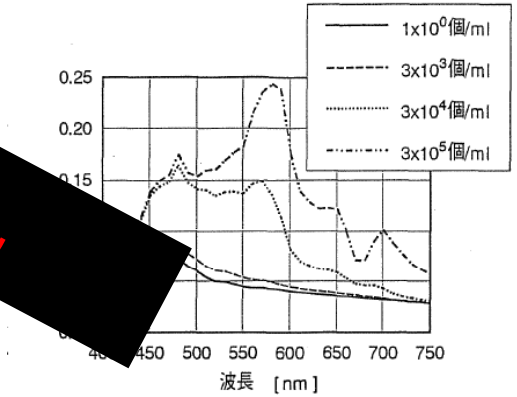


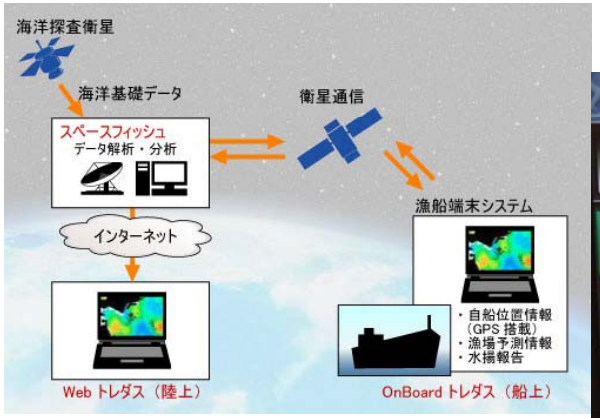
On-going
- Land aerosol correction
- Sunglint correction (coastal area)

Just started
- *Adjacent scattering from bright surface*

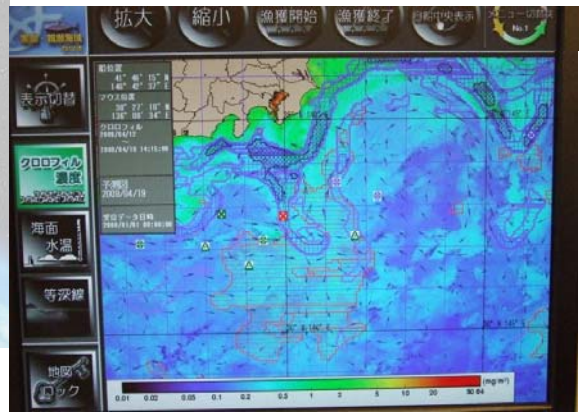
GCOM-C Ocean Science is not only for the Global Oceans but also for Coastal Waters !!

5.5m
in 2010

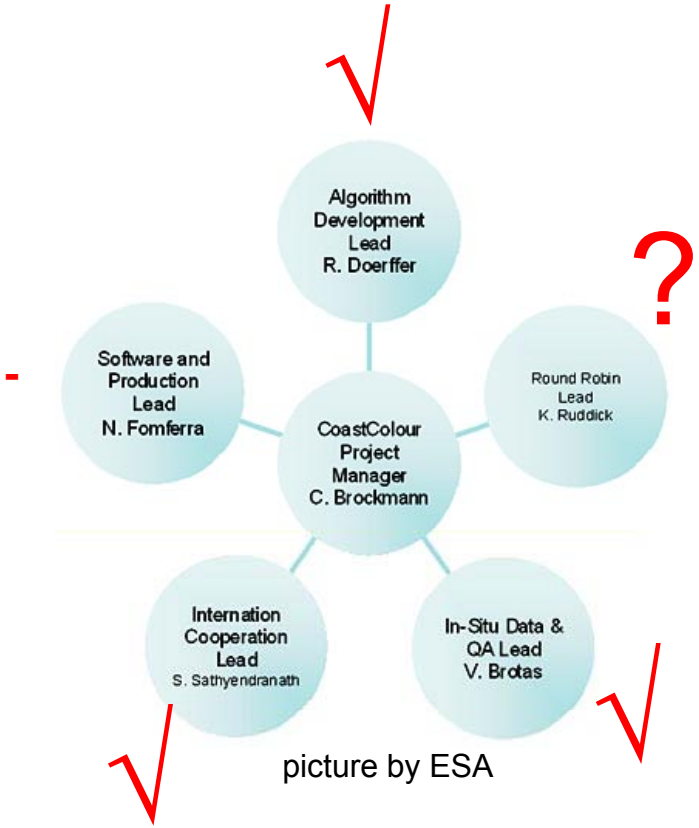




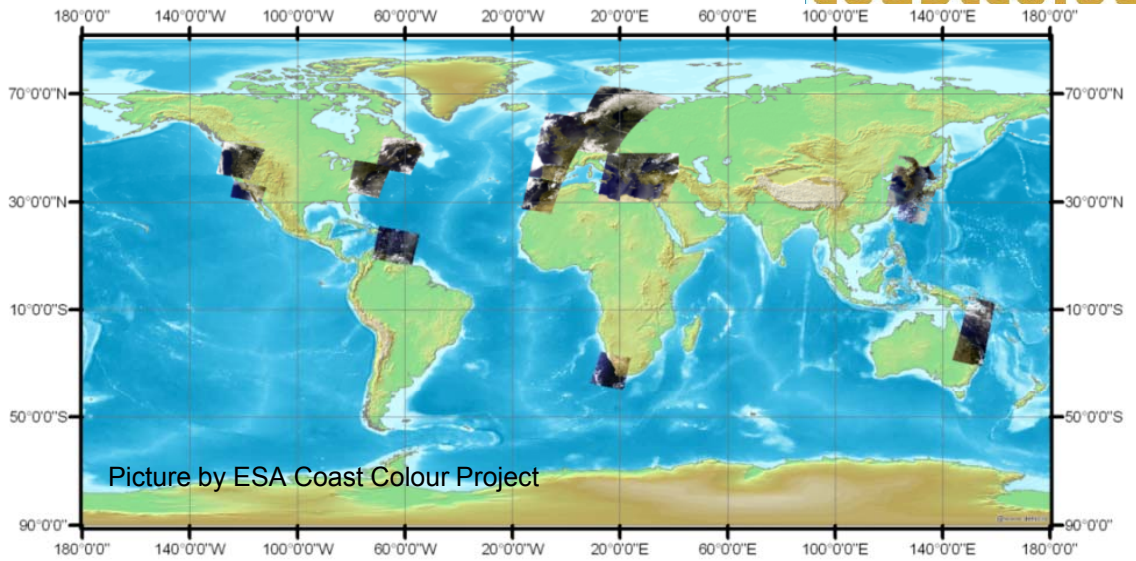
Picture by SpaceFish LLP



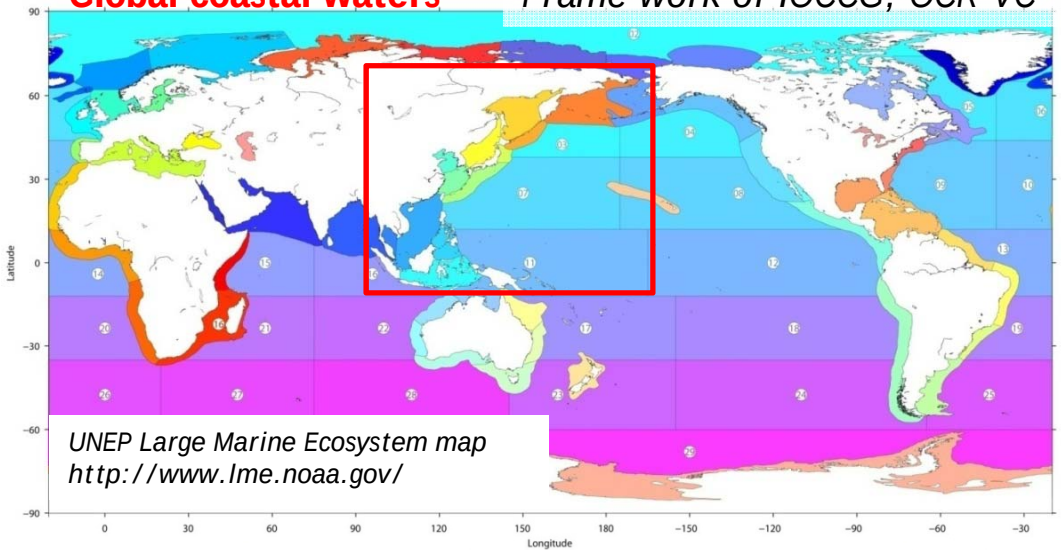
Common activities between CoastColour and GCOM



picture by ESA



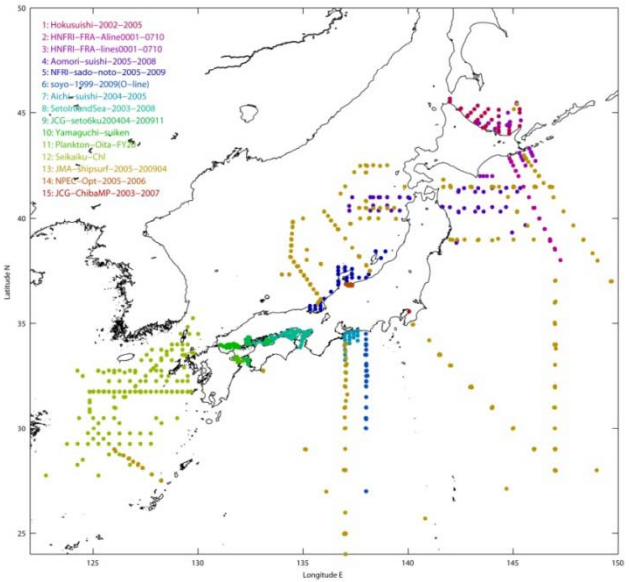
"Global coastal waters" *Frame work of IOCCG, OCR-VC*



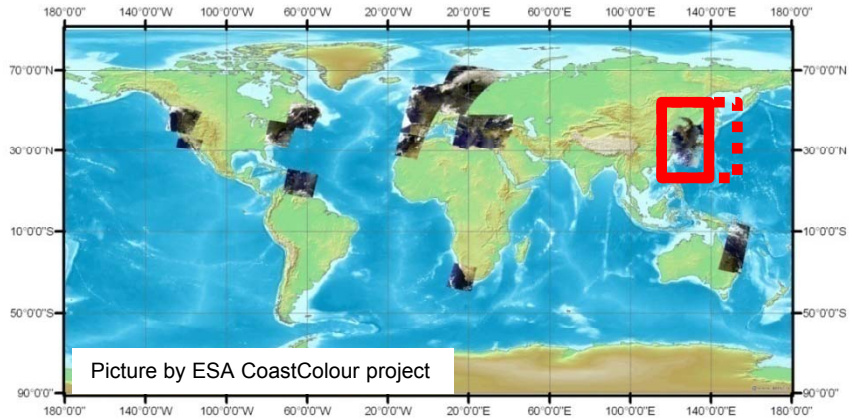
Contribution from GCOM-C/JAXA to CoastColour/ESA

Contribution to an insitu data library

-Algorithm development
-Algorithm validation

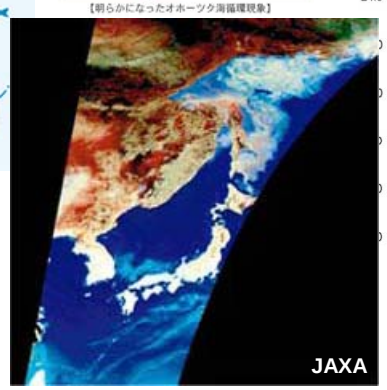


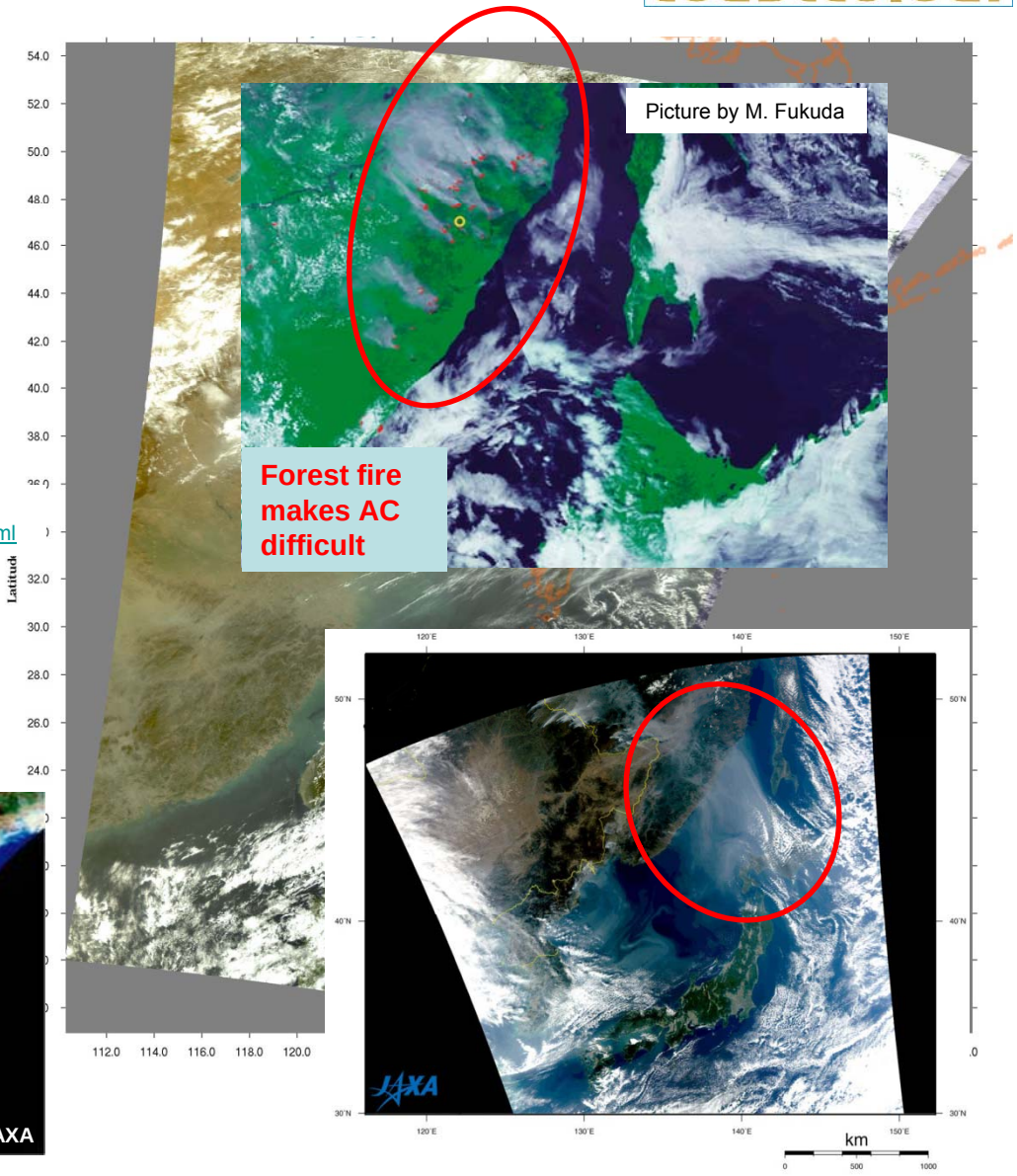
File name	*Area*	*parameters*
GLI mutch-up data *(GLIval¥DAT)*		
TriOS (Ferry 20030320)	Nagasaki - Goto Islands	5 nLw (TriOS)
TriOS (Jetfoil 20030923)	Nagasaki - Goto Islands	2 nLw (TriOS)
TriOS (Jetfoil 20030926)	Nagasaki - Goto Islands	12 nLw (TriOS)
Isahaya (20030414)	Ariake Bay	0 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
Isahaya (20031017)	Ariake Bay	2 CHL, 3, K490, 3 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
REDTIDE20030722	Ariake Bay	17 CHL, 15 SS, 15 CDOM, 13 K490, 13 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
Nagasaki (Na03058)	East China Sea	2 CDOM, 0 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
Nagasaki (Ka030519)	East China Sea	2 CHL, 1 SS, 2 CDOM, 1 K490, 1 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
K030602	East China Sea	1 CHL, SS, CDOM, K490, PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
Kakuyo-Maru 031017	Ariake Bay	8 CHL, 6 K490, 6 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
NPEC 200305	Toyama	14 CHL, 10 SS, 6 CDOM, 5 K490, 5 MER2040 nLw 412, 443, 465, 490, 510, 520, 555, 565, 586, 625, 665 and 680nm
Hakuho 0302	NW Pacific	3 CHL, 3 CDOM, 4 MER2040 nLw 412, 443, 465, 490, 510, 520, 555, 565, 586, 625, 665 and 680nm
Hakodate	N Pacific	8 CHL, 6 MER2040 nLw 412, 443, 465, 490, 510, 520, 555, 565, 586, 625, 665 and 680nm
Tokyo&Sagami-Bay	Tokyo Bay	11CHL, 5 SS, 5 CDOM, 4 PRR800 nLw 380, 412, 443, 465, 490, 510, 532, 555, 565, 589, 625, 665, and 683nm
Seikai-NFRI (YK0305)	ECS	5 CHL, 1 K490, 1 PRR600 nLw 412, 443, 490, 510, 555, and 565nm
Seikai-NFRI (YK0306)	ECS	0 PRR600 nLw 412, 443, 490, 510, 555, and 565nm
NFRIAriake (YK0305)	Ariake Bay	11 CHL, 5 K490, 5 PRR600 nLw 412, 443, 490, 510, 555, and 565nm
Tohoku-NFRI (SPINUP)	Off Hokkaido and the N Pacific	5 CHL, 1 K490, 1 PRR600 nLw 412, 443, 490, 510, 555, and 565nm
Other mutch-up data		
Optical_Data_2005_2006_NPEC.csv	Toyama Bay	CHL, SS, CDOM, k490, nLw380, 400, 412, 443, 460, 490, 520, 545, 565, 625
Optical Data 2005_Isahaya_Tsushima	Kyusyu	CHL, SS, CDOM, k490, nLw380, 400, 412, 443, 460, 490, 520, 545, 565, 625
SNFRI-YSLMEdataset_ECS_JAXAr1.xls	East China Sea	CHL, SS, k490, nLw412, 443, 490, 510, 520, 555, 565, 670
A_line_NFRI_Saitoh_Kameda	A-line	CHL, k490, nLw412, 443, 490, 510, 520, 555, 565, 670



Picture by Amur-Okhotsk project

http://www.hokkaido-jin.jp/issue/sp/200501/nazo_2.html





Conclusions

Q1. Are you able to collaborate with the Coast Colour project?

(partipication in round-robin, contribution of in situ data for validation of products in your area, others?)

A1. Yes. GCOM/JAXA is able to collaborate with the CoastColour/ESA by providing in situ data.

Q2. What aspects of CoastColour project are most important for your applications and interests (regional coverage, error specification, error reduction, type of products offered, high spatial resolution, others)

A2. Regional coverage (to include the northern islands of Japan) and the atmospheric correction (robustness over time regardless of dust/smoke cover

Thank you