C6 Land Water Mask

Sadashiva Devadiga, Pete Ma and
Mark Carroll

Summary

- Compared the C5 Land Water Mask to the C6 LWM. Computed the difference statistics from the 7 class LW mask.

- C6 land water mask shows improvement in definition of small inland water features, lakes, shorelines and Improvement in definition of rivers.

- C6 LW Mask addresses the issue of geolocation shift observed in the C5 LW Mask at high latitude (e.g. tile h17v00).

- Statistically, 93% of the classes matched between the two versions of land water mask.

Confusion matrix comparing C5 vs C6 water mask.

| C5 Mask	0	1	2	3	5	6	7	
C6 Mask	Shallow Ocean	Land	Shoreline	Shallow Inland	Deep Inland	Mod. Ocean	Deep Ocean	Total
0 Shallow Ocean	66,064,777	2,494,034	3,179,627	165,235	809	45,889,107	956,637	118,750,226
1 Land	541,970	646,883,341	4,862,811	1,204,525	8,095	16,423	192	653,517,357
2 Shoreline	545,582	12,370,392	2,519,087	895,621	984	6,010	379	16,338,055
3 Shallow Inland	72,016	5,411,904	2,366,318	5,893,698	623,283	43	-	14,367,262
5 Deep Inland	123	558	915	614,639	245,001	-	-	861,236
6 Mod. Ocean	5,270,037	86,763	211,545	3,962	-	36,370,514	7,586,840	49,529,661
7 Deep Ocean	1,814,187	5,129	12,196	57	-	7,549,884	836,966,734	846,348,187
Total	74,308,692	667,252,121	13,152,499	8,777,737	878,172	89,831,981	845,510,782	

Class 4, Ephemeral water, is not populated in either mask so has been omitted from the table.

Global Image of C6 LW Mask
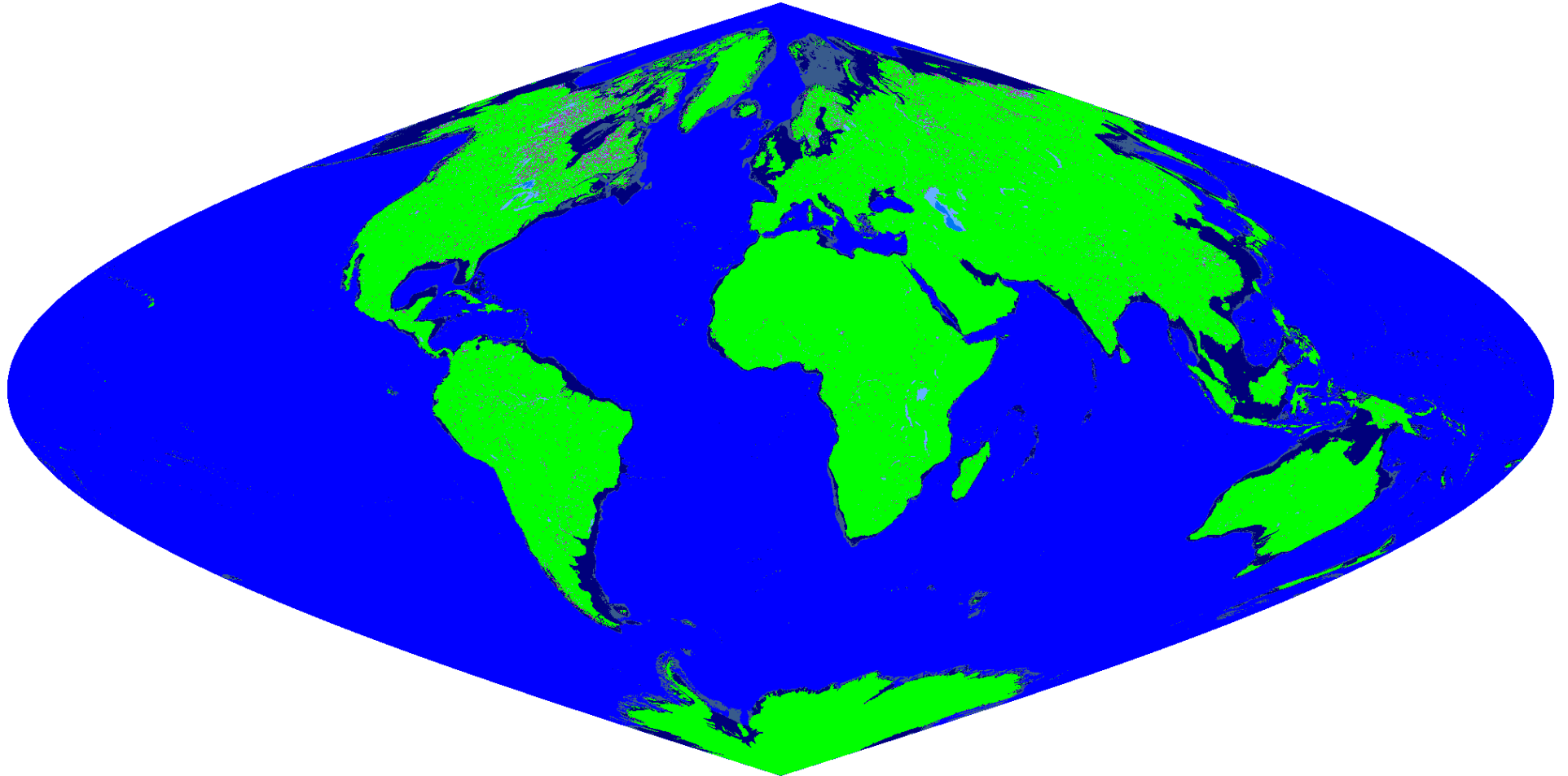
- 00: shallow ocean
- 01: land
- 02: ocean coastlines and shorelines
- 03: shallow inland water
- 05: deep inland water
- 06: continental / moderate ocean
- 07: deep ocean
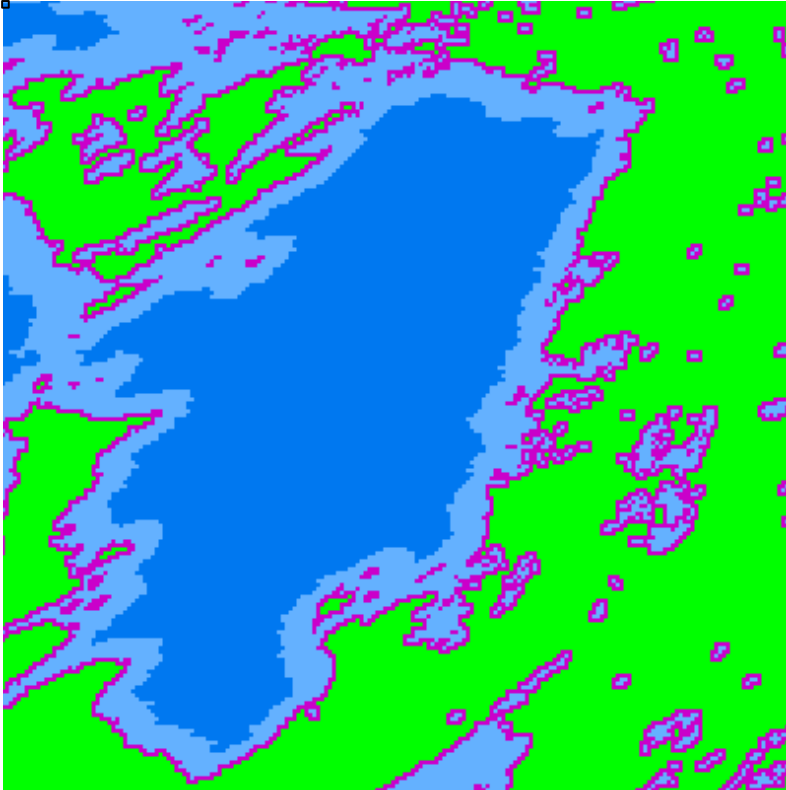
Global Image of C5 LW Mask
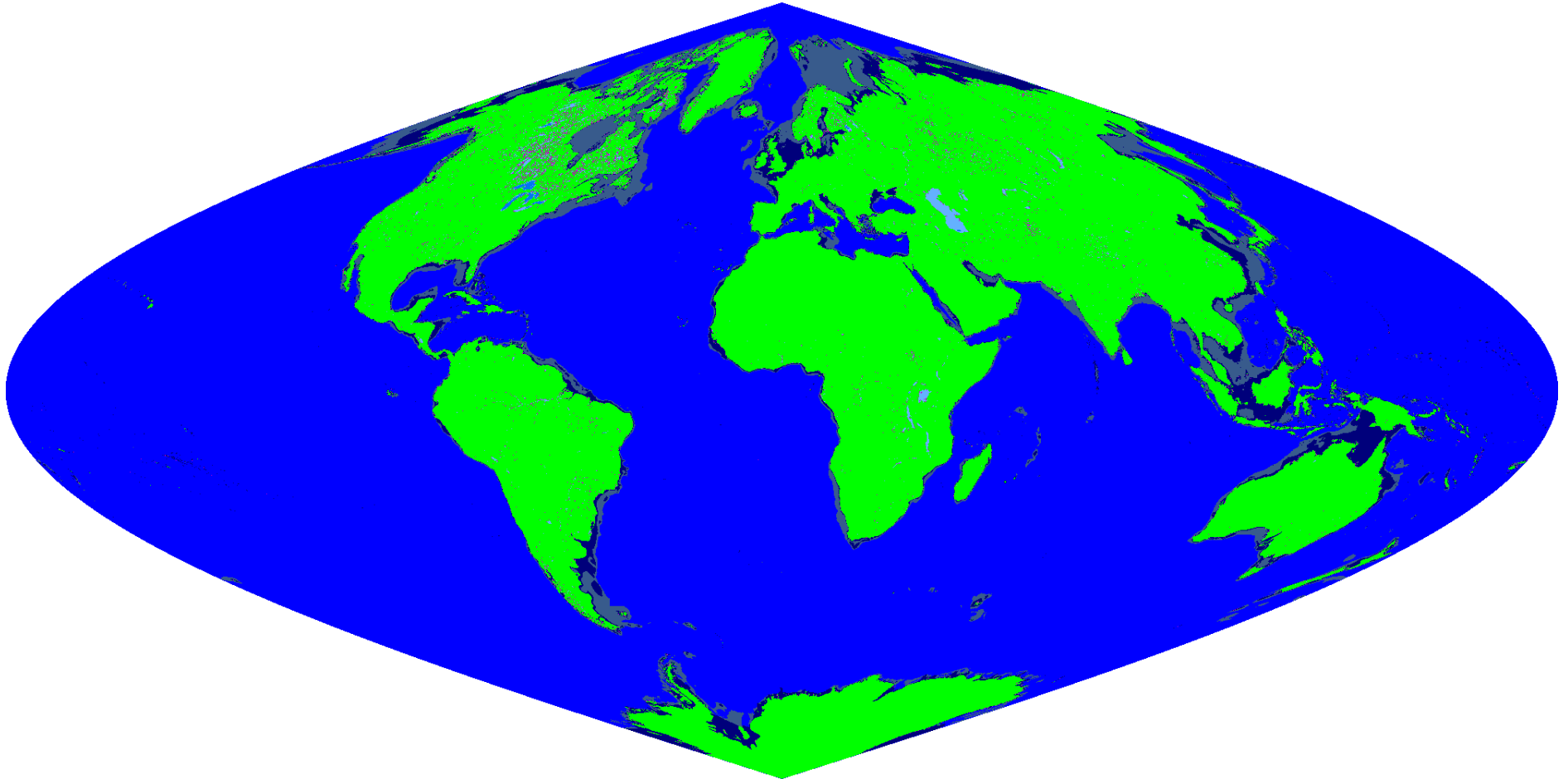
- 00: shallow ocean
- 01: land
- 02: ocean coastlines and shorelines
- 03: shallow inland water
- 05: deep inland water
- 06: continental / moderate ocean
- 07: deep ocean

# Differences between C5 and C6 water mask for MODIS
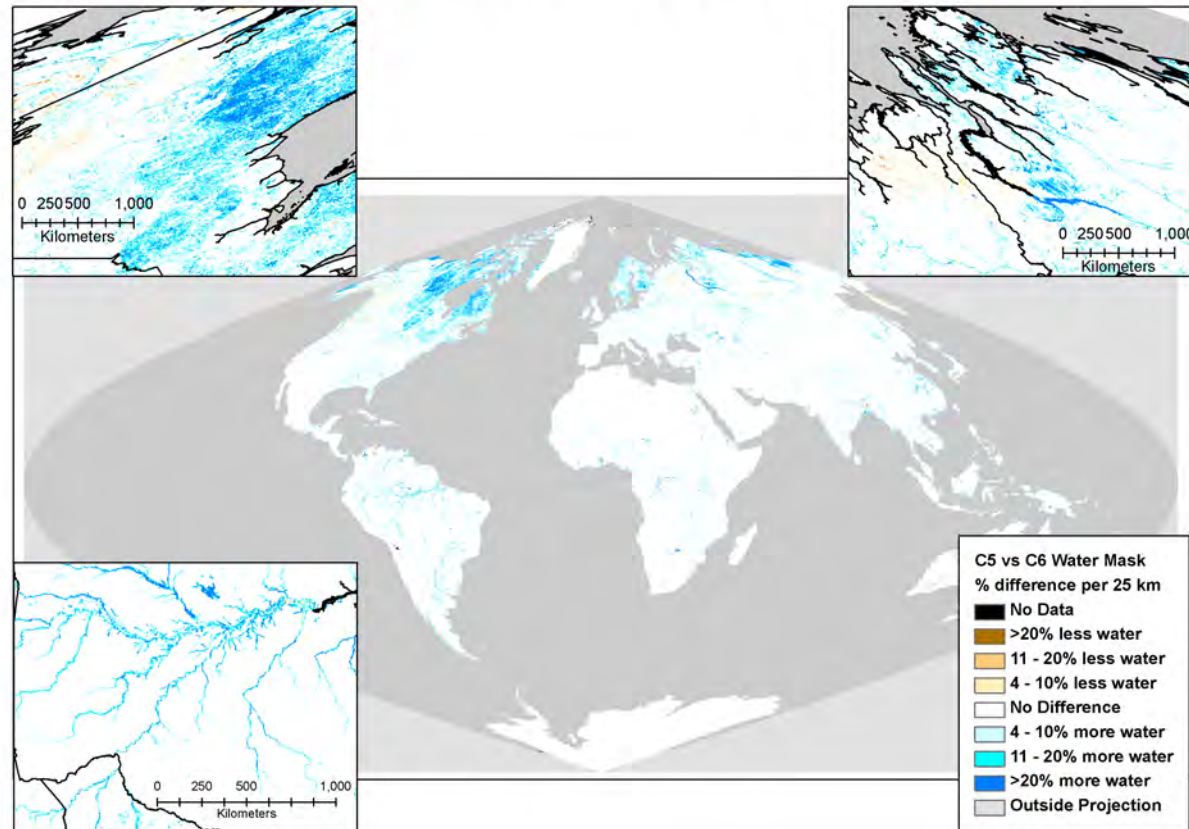
The differences between the Collection 5 vs the Collection 6 water mask for MODIS. Differences are represented as percent difference per 25km grid cell for visibility with more water shown in shades of blue and less water shown in shades of brown.

Source: White paper on C6 LW Mask posted at http://landweb.nascom.nasa.gov/cgi-bin/QA_WWW/
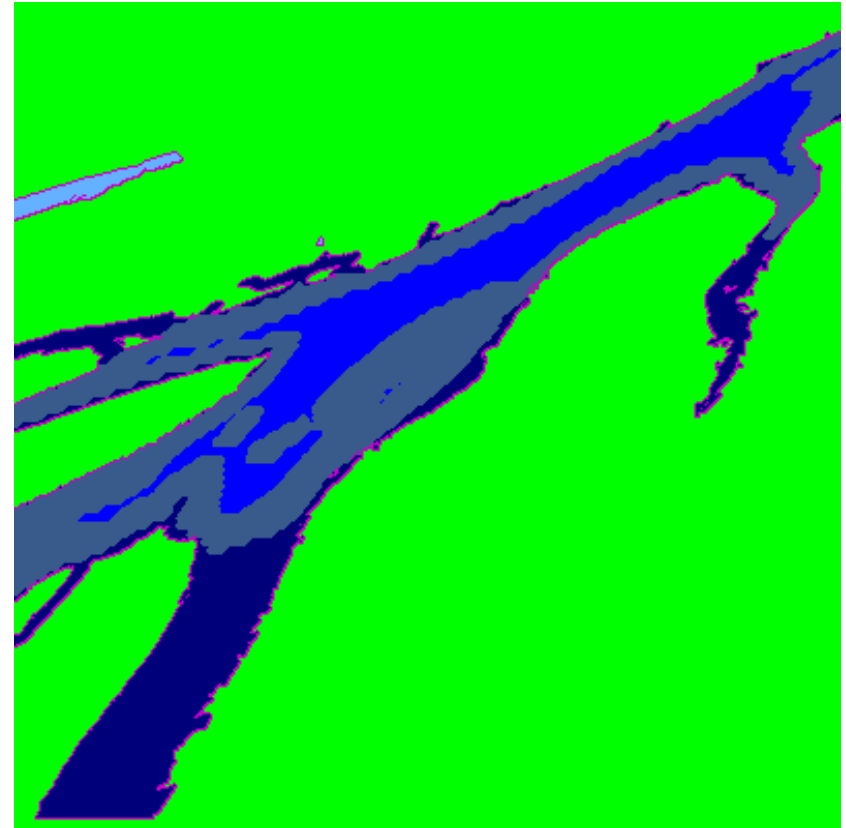
MOD12Q1.A2001001.h12v04.004.2004358134126.hdf
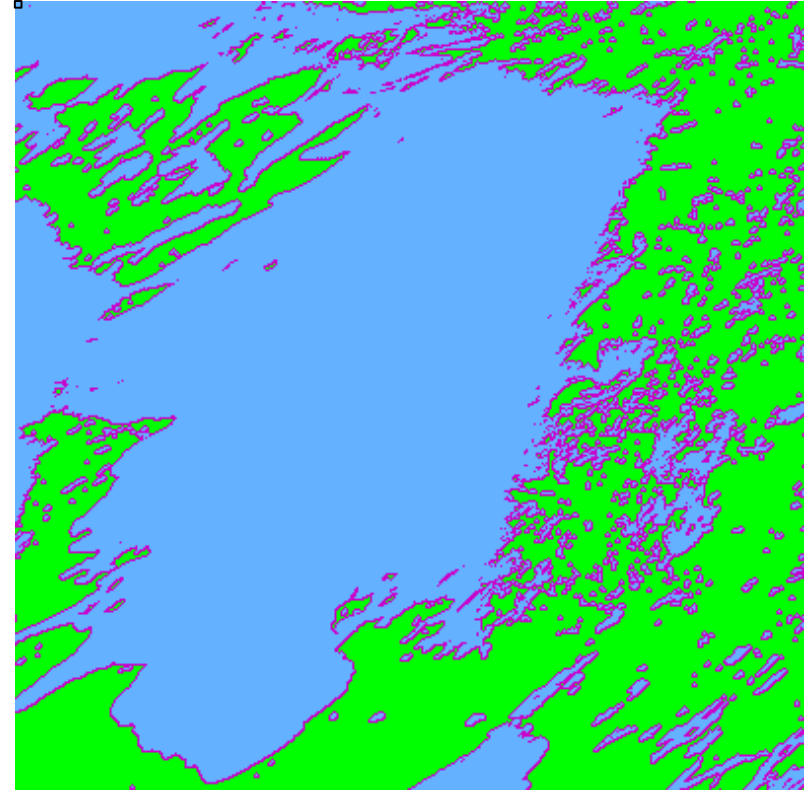
MOD44WA1.A2000055.h12v04.005.2010251165201.hdf

- The spatial subset of the tiles above show large and small lakes over Canada.
- There is a significant improvement in defined shorelines, and small inland water bodies.

00: shallow ocean
01: land
02: ocean coastlines and shorelines
03: shallow inland water
05: deep inland water
06: continental / moderate ocean
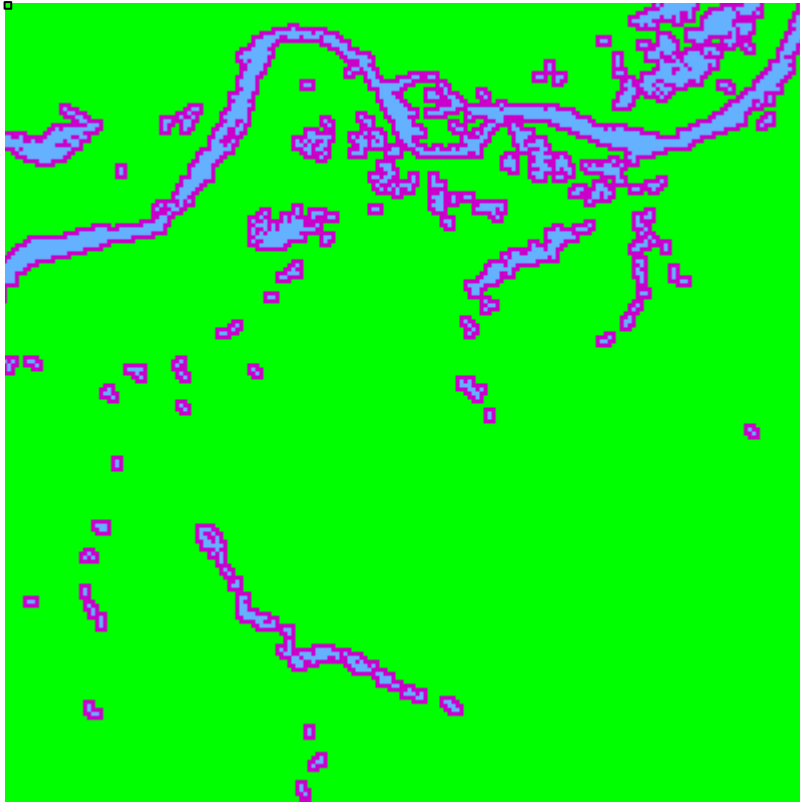07: deep ocean

MOD12Q1.A2001001.h17v00.004.2004358134250.hdf

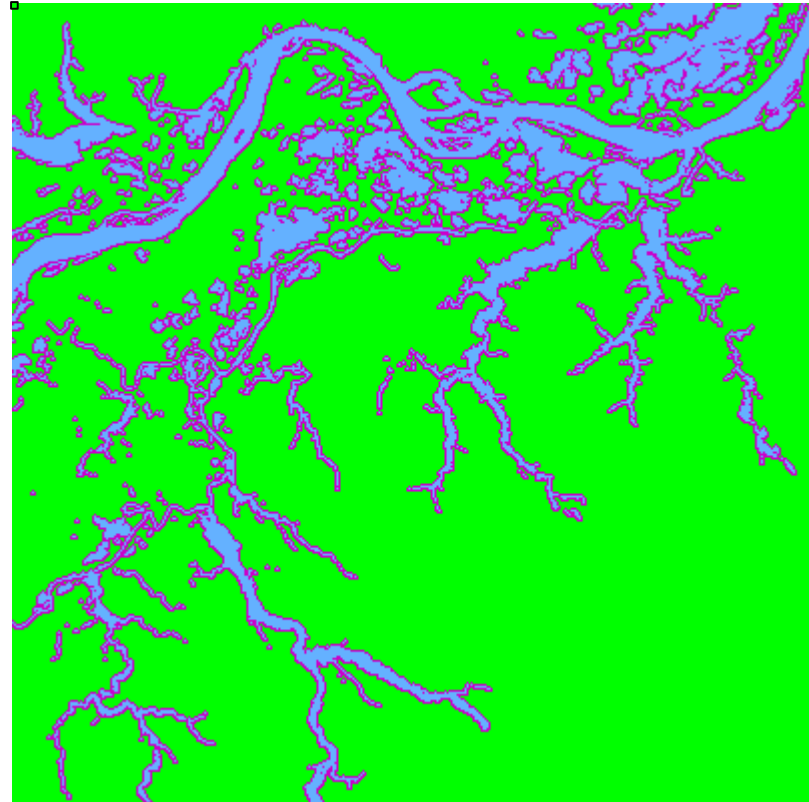MOD44WA1.A2000055.h17v00.005.2010251165201.hdf

- The spatial subset of the tiles above show tile h17v00.
- There is a significant improvement in geolocation. Which resolves the previous issue noted.

00:	shallow ocean
01:	land
02:	ocean coastlines and shorelines
03:	shallow inland water
05:	deep inland water
06:	continental / moderate ocean
07:	deep ocean

MOD12Q1.A2001001.h12v09.004.2004358134134.hdf

MOD44WA1.A2000055.h12v09.005.2010251165201.hdf

- The spatial subset of the tiles above show the Amazon river in Northern Brazil.
- There is a significant improvement in defined rivers and streams.

00: shallow ocean
01: land
02: ocean coastlines and shorelines
03: shallow inland water
05: deep inland water
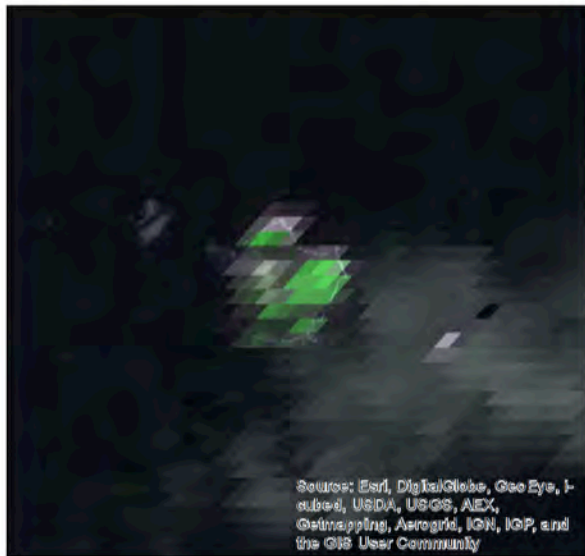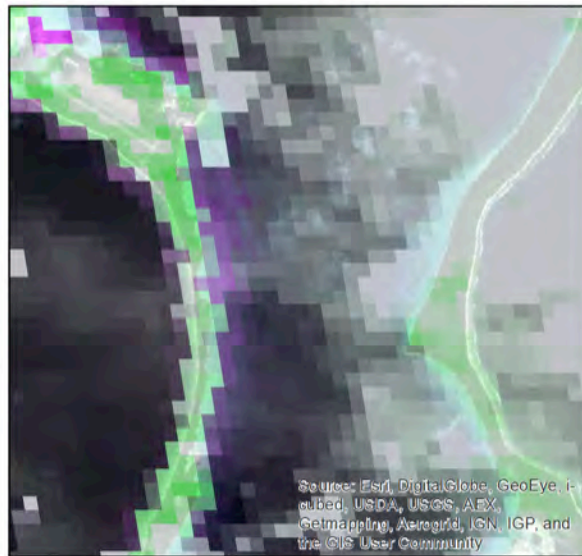06: continental / moderate ocean
07: deep ocean
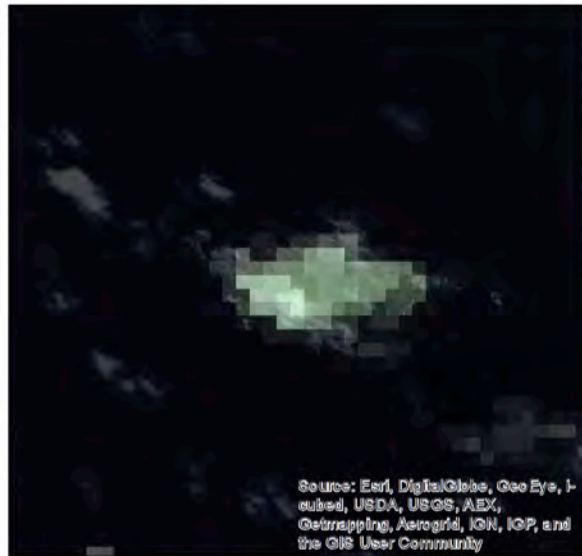
A tile level comparison of LW Mask showed four tiles of C6 LW Mask, where new land values were detected. For these same tiles, no land pixels were found in the C5 LWM.

These four tiles contain little islands. The images on the left show overlay of RGB composite reflectance image from MOD09Q1 on the high resolution google images of island.

Source: Esri, DigitalGlobe, Geo Eye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Source: Esri, DigitalGlobe, Geo Eye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H30v05

0 0.5 1 Km   1:100,000

H10v11

Source: Esri, DigitalGlobe, Geo Eye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

H31v06

H25v09

	MOD44WA1 500m (UMD)			MOD12Q1 500m (from TK)			
Tiles	Land	Not Land		Land	Not Land	Place on earth	
h10v11	3	5759997	h10v11	0	5760000	Misteriosa Isla San Ambrosio	
h25v09	12	5759988	h25v09	0	5760000	Diego Garcia	
h30v05	2	5759998	h30v05	0	5760000	Torishima	
h31v06	1	5759999	h31v06	0	5760000	Urracas	