VCM Status

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JPSS Cloud Mask Team

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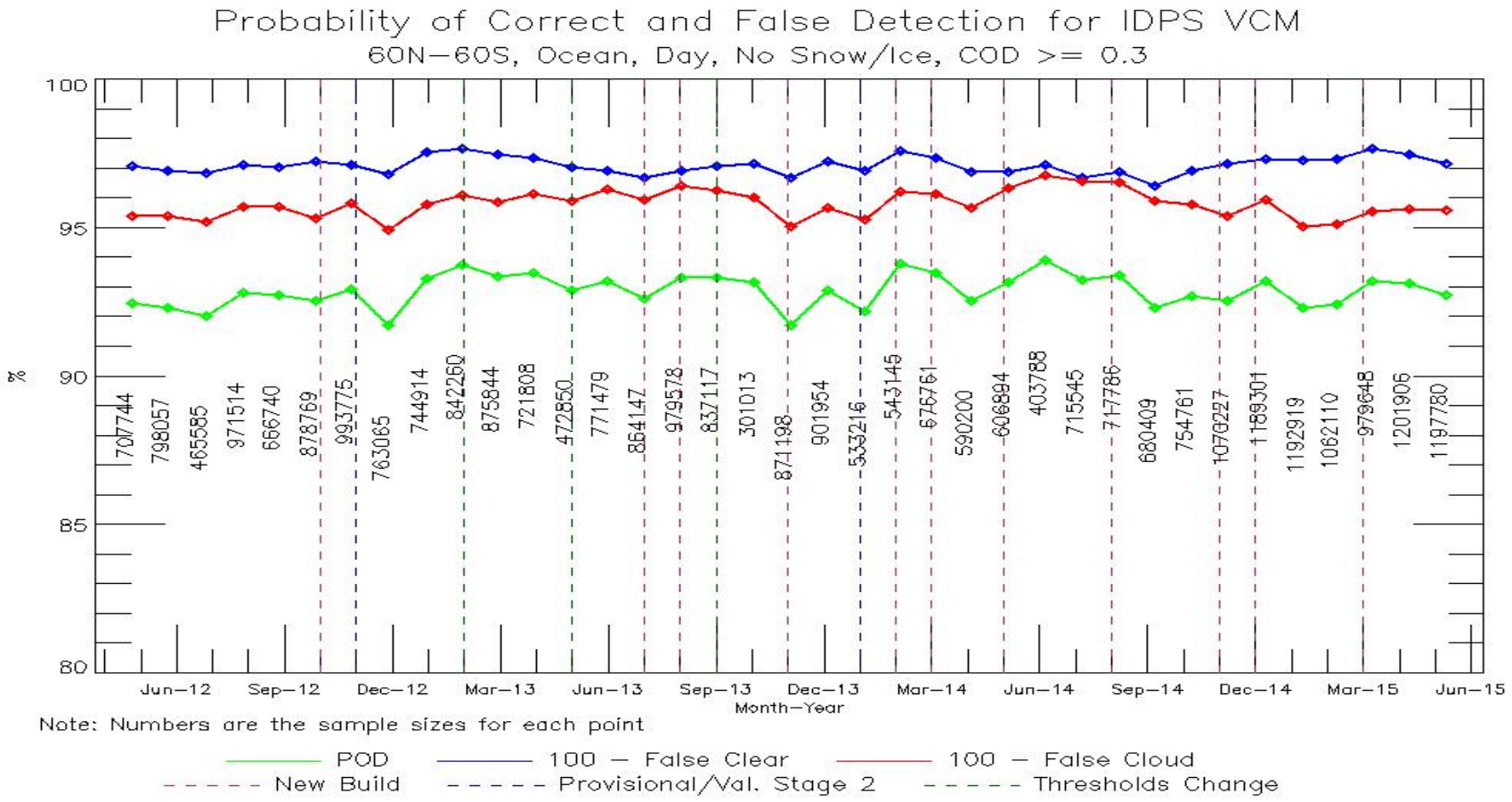
Overall Status

- The VCM continues to meet or exceed its requirements
- The core team has lost 30% of its personnel over the last year
- The focus of work has transitioned to corrections as requested by downstream users and written as DRs
  - This is consistent with the program memo from 2014 limiting work to corrections only, and no “improvements”
- Software updates over the past year have corrected issues with the cloud shadow and ephemeral water Quality Flags
- Tuning is decreasing in frequency, as expected
  - Adjustments were made in early 2015 to reduce false alarms over deserts and improve the probability of correct typing at night
  - One more tuning event is planned in the fall, before Block 2.0
- Noticeable improvement is seen with the implementation of a daily snow/ice (GMASI) update starting 1 December 2014

Overall Performance

Global, non-polar statistics as of June 2015, Ocean Day, No snow

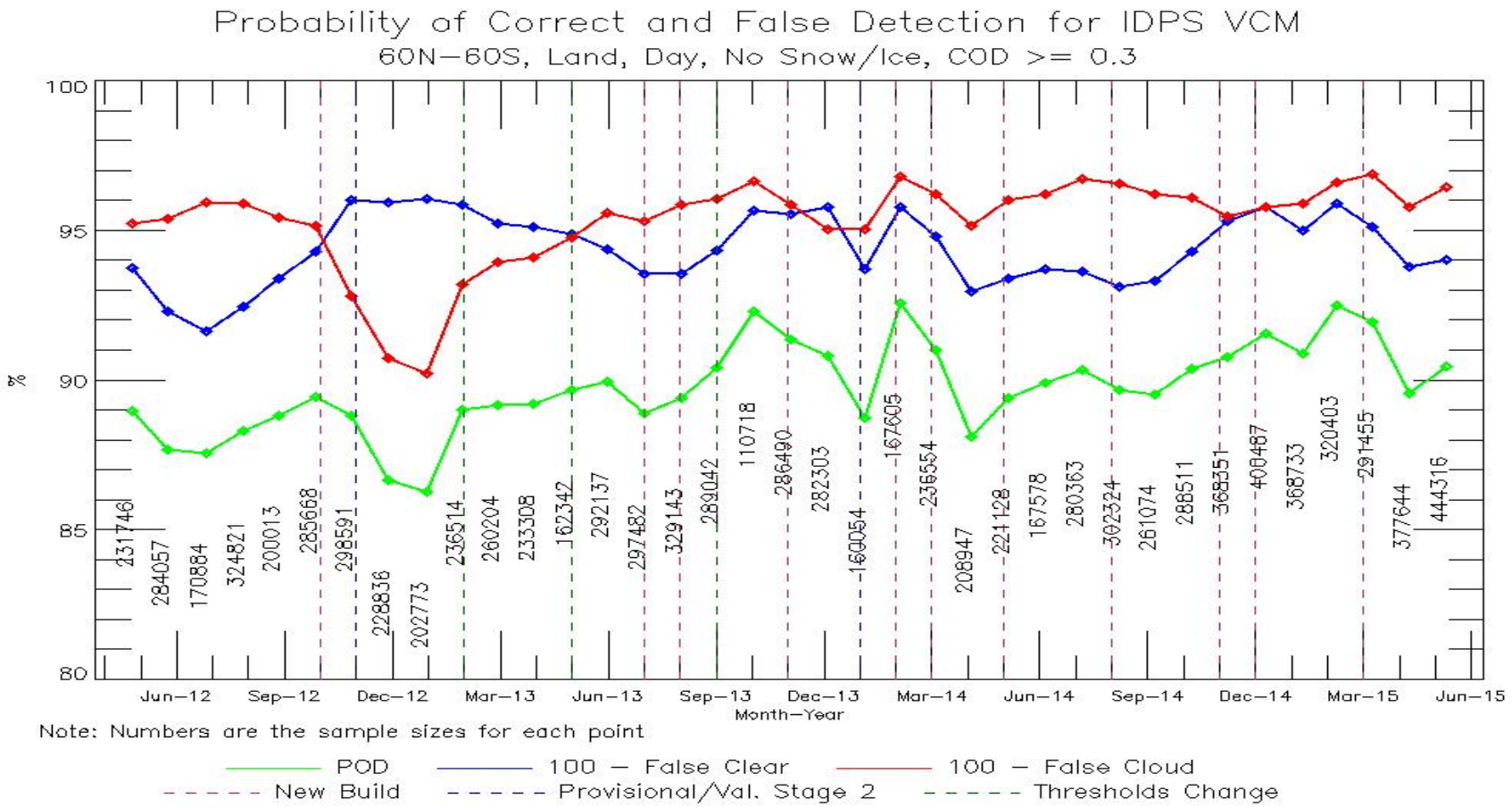
Values are for COD > 0.3 but requirement is for COD > 1.0



Overall Performance

Global, non-polar statistics as of June 2015, Land Day, No snow

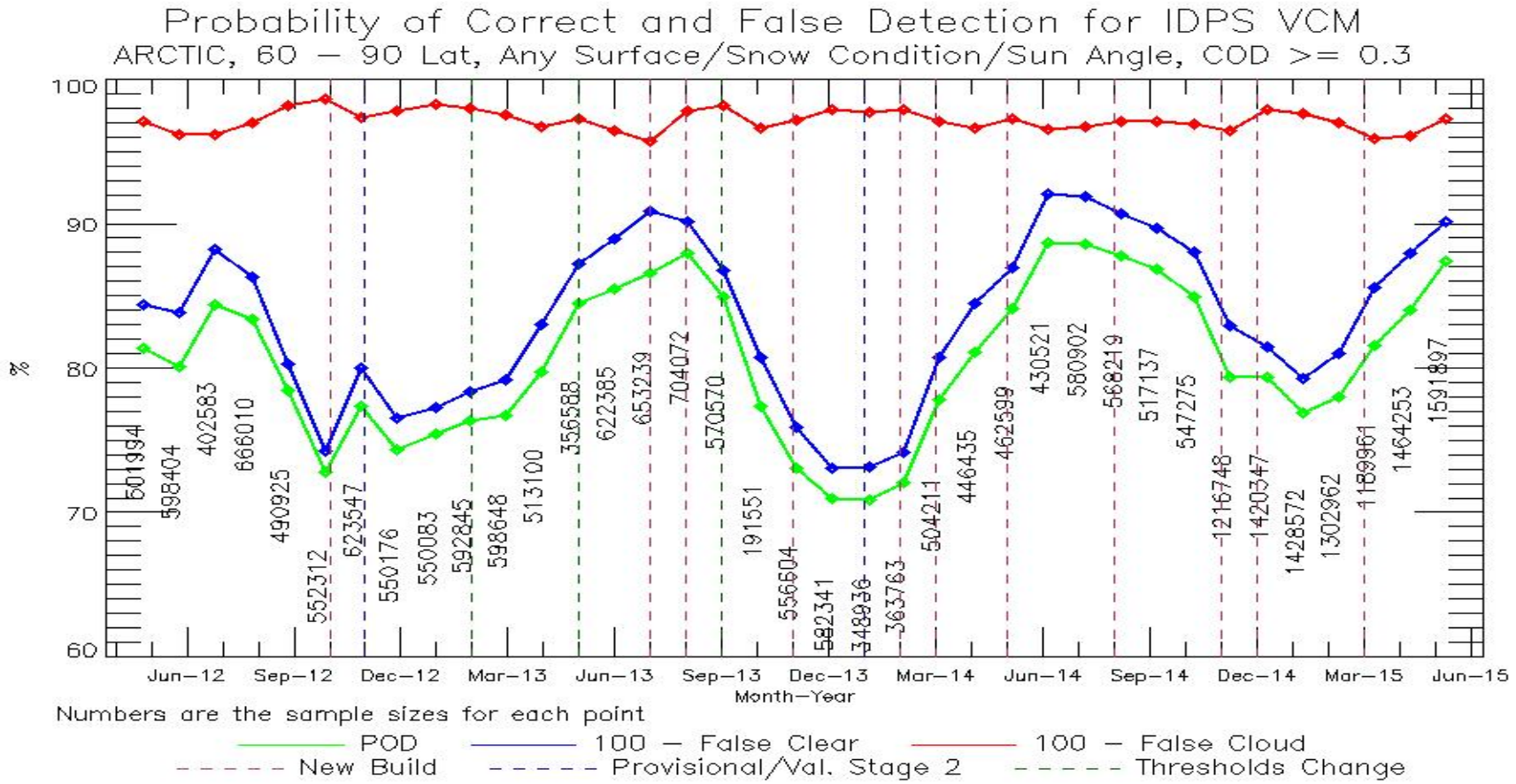
Values are for COD > 0.3 but requirement is for COD > 1.0



Overall Performance

Global statistics as of June 2015, Snow Day, Polar Regions

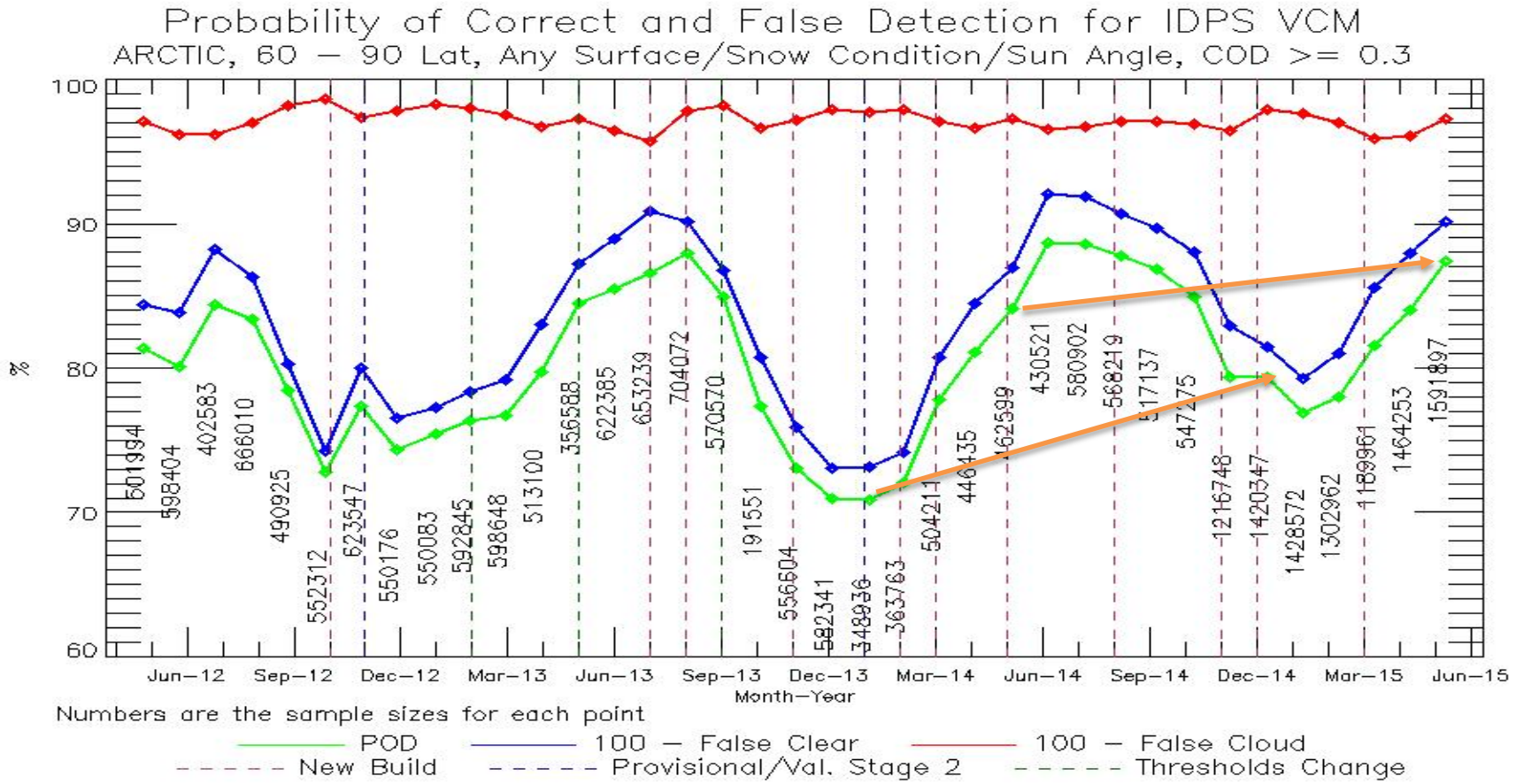
Impact of GMASI not obvious unless you compare similar months



Overall Performance

Global statistics as of June 2015, Snow Day, Polar Regions

Lines show improvement from monthly updates to daily updates

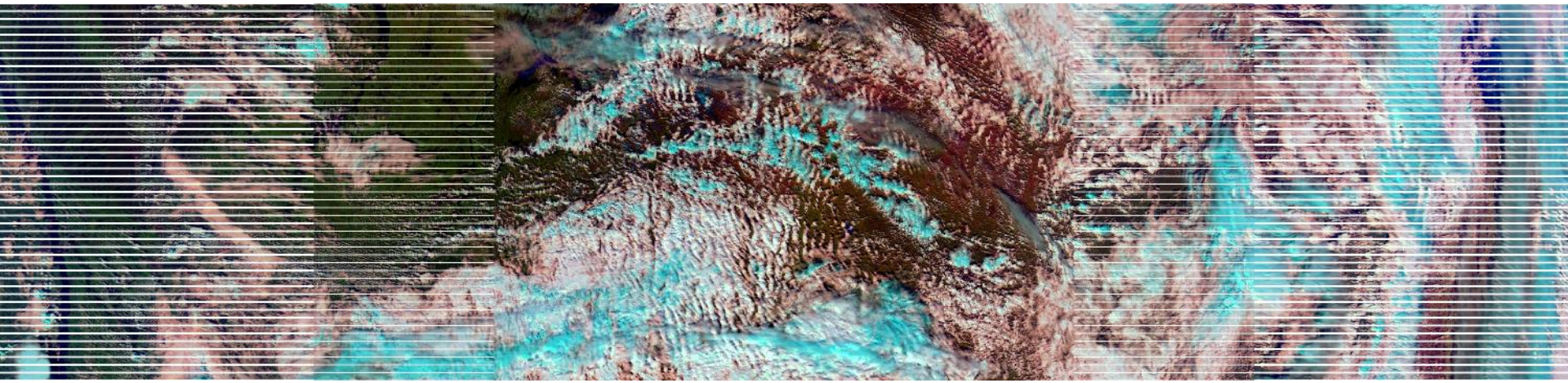


Near term efforts

- There are three active efforts with the VCM at present
  - Software update currently under review at the AERB mitigates the clouds over fires DR
    - Update addresses land backgrounds only, though that is where the majority of the error occurs
  - Tuning updates to address leakage (ice clouds) over cold backgrounds and over deserts at large viewing angles, possibly other items in late September/early October
    - Goal is to have these updates implemented before the Northern Hemisphere winter season
  - Software update in testing to sharply reduce leakage over cold bare ground, recent DR as requested from the cryosphere team with missed ice clouds
    - Example of the issue on the following slides

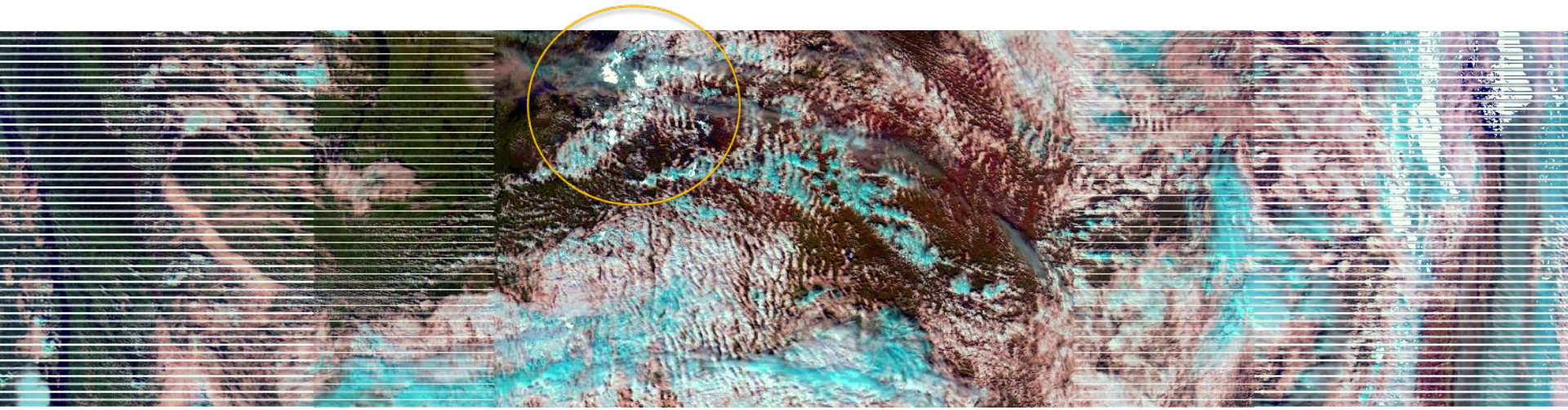
Siberia

June 18, 2015, Red = M10, Green = M7, Blue = M1
White is lower cloud, blue shading is ice topped clouds
Darker shades of blue is surface snow, but the only location in this image where it exists and can be seen is on the right



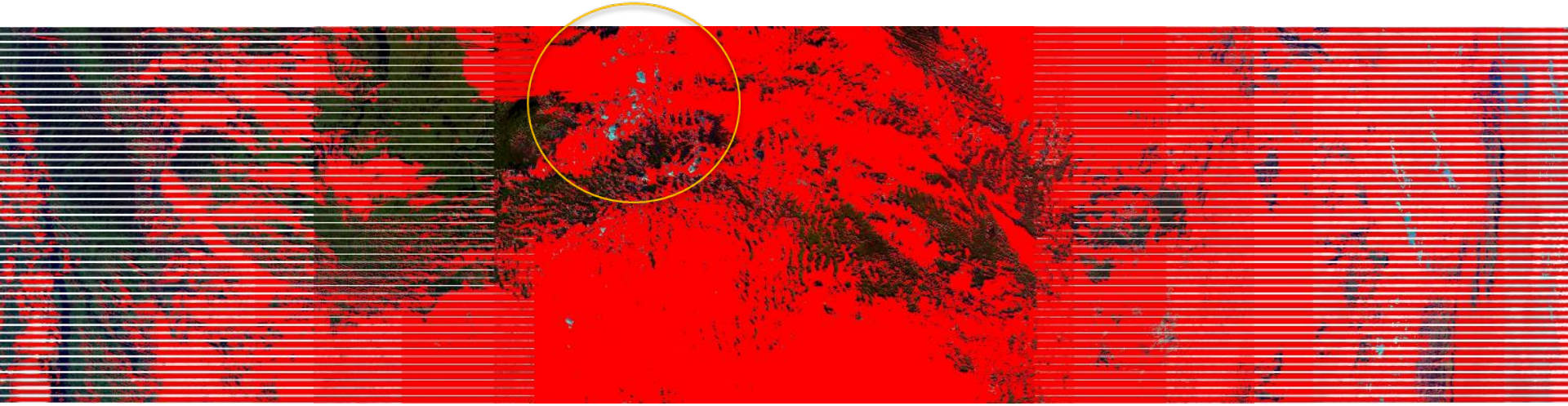
Siberia

June 18, 2015, Red = M10, Green = M7, Blue = M1
White is lower cloud, blue shading is ice topped clouds
Snow, which is a combination of the daily GMASI ancillary data set and the VCM snow test, is bright white below.
The areas of snow in the middle are clouds



Siberia

June 18, 2015, Red = M10, Green = M7, Blue = M1
White is lower cloud, blue shading is ice topped clouds
Red is confidently cloudy, note the missed clouds in the middle of the granule
Most of that cloud is missed even under the probably condition (not shown)



Ice cloud fix

- Feedback from the cryosphere team in May 2015 reported missed ice clouds over cold bare ground was leading to spurious snow in the cryosphere products
  - Cryosphere products are impacted most where the ground is bare, hence missed ice clouds are interpreted as ground snow, issue occurs only if surface is cold enough that snow/ice is possible
- Extensive evaluation has led to a promising fix to the problem
  - In testing is use of M10 as a stand alone screen to identify pixels difficult to clearly identify as ground snow/ice or ice clouds
  - In this case VCM will default to GMASI, and the brightness of the pixel will flag these cases as clouds when GMASI does not contain snow/ice for that pixel
  - Essentially the daily update allows the VCM to increase dependence on the ancillary snow/ice field, something not possible until 1 December 2014

Post Block 2.0

- Ice cloud fix is targeted for the first Block 2.0 implementation (highest priority)
- Three potential software updates exist in the VCM “queue”
  - Use of an ancillary Sea Surface Temperature field instead of the GFS for determining surface temperatures as part of cloud detection over oceans process
  - Develop a module for Antarctica
  - Extend the correction of clouds over fires to other backgrounds than land, and for night (gas flares)
- Any feedback and/or new DRs that may be addressed via tuning, these are not tied to builds

JPSS-1 Preparation

- No major software changes are necessary for the VCM to support JPSS-1
- The tools needed to validate either the VCM or the Enterprise cloud mask are in place
- Quantitative validation may be slowed if CALIPSO is no longer available
- Similar to S-NPP, a 30-day spin up is planned to insure the VCM is at least at beta, if not provisional, level early in the EDR validation process
- There is every reason to believe the VCM will meet its requirements for JPSS-1, including any altered by the program by launch

Summary

- The VCM continues to make progress and address downstream concerns from dependent users
- The VCM continues to at least meet all of its requirements
- The daily snow update clearly benefited the VCM, and now allows us to make adjustments as the VCM no longer has to concern itself with severely dated snow/ice backgrounds
- The clouds over fires mitigation is scheduled for Build 8.12
- The ice cloud fix is being worked to make the first post Block 2.0 build
- The cloud mask team has the tools available to support the validation of JPSS-1 for either or both cloud masks in play
- Feedback from the users is always encouraged, remember tuning is not tied to a build

Extra Material Follows

THANK YOU

Statistical Results, Clouds over Fires

Results are from 6 consecutive daytime granules over Africa on 15 June 2015

FIRE:						Mx8.10	Mx8.12			Mx 8.12 (fire fix) has:
LAND	ConfCldy	HiQual	DAY	FIRE		3776	2108		-1668	2294 fewer Conf Cldy
LAND	ConfCldy	MedQual	DAY	FIRE		2075	1449		-626	
LAND	ConfClr	HiQual	DAY	FIRE		9	1201		1192	1818 more Conf Clr
LAND	ConfClr	MedQual	DAY	FIRE		13	639		626	
LAND	ProbCldy	HiQual	DAY	FIRE		2	15		13	13 more Prob Cldy
LAND	ProbCldy	MedQual	DAY	FIRE		2	2		0	
LAND	ProbClr	HiQual	DAY	FIRE		8	471		463	463 more Prob Clr
LAND	ProbClr	MedQual	DAY	FIRE		9	9		0	
NO FIRE:						Mx8.10	Mx8.12			Mx 8.12 (fire fix) has:
LAND	ConfCldy	HiQual	DAY	NOFIRE		1092946	1092885		-61	75 fewer Conf Cldy
LAND	ConfCldy	MedQual	DAY	NOFIRE		4112	4098		-14	
LAND	ConfClr	HiQual	DAY	NOFIRE		2243966	2243996		30	44 more Conf Clear
LAND	ConfClr	MedQual	DAY	NOFIRE		2439528	2439542		14	
LAND	ConfClr	LowQual	DAY	NOFIRE		251	251		0	
LAND	ProbCldy	HiQual	DAY	NOFIRE		36220	36223		3	3 more Prob Cldy
LAND	ProbCldy	MedQual	DAY	NOFIRE		715	715		0	
LAND	ProbClr	HiQual	DAY	NOFIRE		874705	874733		28	28 fewer Prob Clr
LAND	ProbClr	MedQual	DAY	NOFIRE		14399	14399		0	