



HR MASK CURRENT STATUS AND WAY FORWARD N. TCHINTCHARADZÉ & C. POTTIER (CNES) D. ESTEBAN-FERNANDEZ (JPL)

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WHY IS A HR MASK NEEDED? SOME REMINDERS

Science Definition Team, Toulouse, July 2015

Scientific requests:

- for oceanography / Low Resolution mode: to download 500m res / 250m posting data
- for hydrology / High Resolution mode: to have data with min presumming factor (baseline value = 2.125 – option = 2.4375)

System constraints:

- KaRIn output / SSR input limit = 360 Mbps and Downlink = 620 Mbps
- Station visibility duration = max 212min/day (21 Xband fly-by)
 - Not possible to have HR everywhere ! "only" 7.9 Tb/day
 => Amount of time in HR ~ 22.28% (mean over one cycle)
- LR/HR repartition:
 - LR: everywhere, even over lands
 - HR: only when the Nadir is over a mask ; current version = defined by the High Resolution Data Coverage Working Group (Y. Chao, S. Biancamaria, et al.; 2013 - 2014)



WHY IS A HR MASK NEEDED? SOME REMINDERS

Science Definition Team, Toulouse, July 2015

System constraints (ctd):

- HR mask implementation:
 - Is defined for the moment (at CNES level) in terms of "start/stop relative times" since the beginning of each reference orbit cycle [0.1s accuracy]
 « HR Analysis segments »
 - System sizing was done considering only [HR Analysis segments > 1s ~ 7km]
 - Until 4 different versions / year
 - » Level-2 system specification (L2-PS-445): The Project System shall, on a nominal basis, be capable of generating, uploading, and executing a mask a least once every season (91 days) to control when high-rate and low-rate measurement data is obtained.
 - » Enough to take into account seasonal effects



CURRENT HR MASK DEFINITION [SDT 2013]

Océan Arctique GRDC Major Basins drainage boundaries
+ Hydro1k basins (based on GTOPO30)
+ Global Lakes and Wetlands Database (GLWD, area>0.1km²)
+ Australia and Gobi: HydroSHEDS (SRTM) basins
- big lakes
- few coastal zones and deserts
+ 3km around coastlines



[following talk by R. Morrow, S. Gille & N. Steunou]

cnes





SOME STATISTICS ON HR ANALYSIS SEGMENTS

| Length | Nb | Total time length | Comment | | |
|------------|------|-------------------|------------------------------|---------------|-------------------------------------|
| <1s | 1055 | 9min | assumed without interest | | |
| 1s-3s | 591 | 18min | Real interest? | | |
| 3s-10s | 911 | 1h32 | Same question | | |
| 10s-100s | 1907 | 18h32 | | | |
| 100s-1000s | 896 | 87h | | >1000s | |
| >1000s | 13 | 3h50 | | t=3.4% | |
| TOTAL | 5373 | 111h | | | <1s nb=20% |
| | | | 100s-100 nb=179 t=1.4% | 00s 6 5 | t=0.1% 1s-3s nb=11% t=0.3% |
| 7 | | | 10s-100s nb=35% t=17% | | 3s-10s nb=17% t=1.4% |

There is « a lot » of short interruptions :

| Interruption | Nb | Total time interrupt | Comment |
|--------------|-----|-------------------------|---------|
| <1s | 279 | 3min45 | |
| 1s-3s | 595 | 17min | ? |
| 3s-10s | 687 | 1h10 | ? |

See examples on next slide



TYPICAL HR SEGMENTS INTERRUPTION



CONCLUSION – WAY FORWARD

Summary

- Current HR mask:
 - Lot of work done to be compliant with the science and system constraints
 - Precise definition of land coverage with a lot of details
- Still work to be done:
 - 1. Optimize the current mask with scientific point of view
 - » Some areas need to be added (estuaries, ...)
 - » ... so some areas need to be removed !
 - » May be remove HR segments < 'a few' seconds
 - » Remove HR segments interruptions < 'a few' seconds ? needed?
 - 2. Make a seasonal mask
 - 3. Work on an HR mask dedicated to CalVal orbit

Working group

- Who?
 - CNES lead = Nicolas Tchintcharadzé + Claire Pottier
 - JPL = Daniel Esteban-Fernandez
 - Science leads + Science Team volunteers ☺

