EUMETSAT and NOAA Programs

-The Jason-2 follow-on issue
-The other programs

Francois Parisot EUMETSAT
Stan Wilson NOAA

Back to March 2007 in Hobart

Where were we ?

What were the next steps ?

What were the open points/issues ?

Where were we?

- **Jason-3 was clearly identified as priority 1 in Europe for satisfying the needs of the Marine Core Services within the GMES initiative**
- **EUMETSAT/NOAA approach was endorsed at high level**
  - **Several exchanges of letters between EUMETSAT, NOAA and CNES confirmed the commitment of these agencies to Jason-3.**
- **Focus group and Application and Implementation Groups were established by EUM and NOAA with participation of CNES, NASA and others**
- **Application Group report is available :**

  ftp://jason:jason4ftp@ftp.eumetsat.int/out/jason3/AWG.
- **Implementation Group work on going; current status is summarized in EUMETSAT Jason-3 position paper :**

  ftp://jason:jason4ftp@ftp.eumetsat.int/out/jason3
- **In order to ensure continuity with Jason-2 and minimize cost and risk, the Jason-3 mission was proposed to be based on a maximum of recurrence with Jason-2, with an orbit choice still open**

Jason-3 Concept

- **Use of PROTEUS platform as in-kind CNES contribution**
- **Use of Altimeter based on Poseidon 3/Jason-2 or SIRAL/Cryosat, with max synergy with Sentinel 3 altimeter; provision of Doris by Europe**
- **Provision by U.S. of radiometer, GPS & Laser as with Jason-2**
- **Provision of launcher and support activities by U.S.; alternative could be European**
- **Use of ground segment, both for command & control and product generation, based on max use of existing elements**
- **Operations scheme based on Jason-2 with NOAA in charge of routine satellite operations as for Jason-1; processing and dissemination of Near Real Time data by EUMETSAT and NOAA; off line processing in Europe with dissemination both from Europe and U.S.**
- **CNES to play role of system prime for EUMETSAT and NOAA; human resources for this activity to be part of CNES contribution to program**
- **Overall cost for development & operation estimated at ~250M€ (TBC).**

What were the next steps?

- **Together**
  - **Initiate discussions on Agreement between U.S. with NOAA and Europe with EUMETSAT on future altimetry mission cooperation**

- **EUMETSAT**
  - **Confirm the proposed funding arrangement**
    - **From CNES through in kind contribution (50M€)**
    - **From EUMETSAT Member States (50M€)**
    - **From the European Commission (50M€)**
  - **Initiate discussions on Agreement between CNES and EUMETSAT**
  - **Initiate Programme preparation documentation at EUMETSAT**
  - **Start a delta definition phase to assess**
    - **Impact of orbit change if any (decision is anticipated before this phase)**
    - **Possible accommodation of radio-occultation mission**
    - **Delta definition studies**
- **U.S.**
  - **Initiate discussions on Agreement between NOAA and NASA regarding JPL as system acquisition agent and access to Jason-2 components**
  - **Confirm launcher options (Taurus-XL, Minotaur-IV…)**

What were the open points?

- **Europe**
  - Funding from European Commission
  - Schedule for program approval and related funding at EUMETSAT
  - How to cope with payment profile for the early years

- **U.S.**
  - Department of Commerce to agree in principle to NOAA initiating a program in operational altimetry
  - NOAA to secure new funding beginning in FY2010
  - NOAA and Navy to assess whether U.S. operational interests could be harmonized in a Jason-3 mission

Today in November 2008 in Nice

What has been done since Hobart ?

What are the open points/issues ?

What are the next steps ?

What has been done since Hobart?

- **Europe**
  - **In July 2007, a proposal to build a Jason-2 follow-on based on Cryosat, the so-called Jason-CS option, was proposed by ESA.**
    - **Motivation was essentially a better European foothold and also the possibility to have a multiple satellite program.**
  - **An ESA/EUM (with CNES support) working group was created; and by beginning of 2008, it developed the proposal to build first Jason-3 and in parallel, start development of Jason-CS through an ESA program.**
    - **The main advantages of this option were the low risk of data gap after Jason-2 and the better longer term perspective.**
  - **EUMETSAT then started the process leading to the approval of an optional program based on this option.**
  - **Unfortunately, this process is blocked today due to funding and political issues (see next slide).**
- **U.S.**
  - **Agreement between NOAA and NASA on JPL serving as systems acquisition agent for Jason-3, as well as access to Jason-2 designs and any spares.**
  - **Launch options confirmed.**
  - **While U.S. Navy is supportive of and interested in Jason-3, its priority is pursuit of a GFO-type follow-on.**

What are the open points/issues?

- **Europe**
  - **For Jason-3, an anticipated equal funding of 46M€ was foreseen from EUMETSAT and the European Commission. Today, the EC (and its Member States) has not identified adequate sources of funding for its part and consequently the EUMETSAT Member States do not consider themselves to be in a position to commit on the remaining part.**
  - **For Jason-CS, a budget line of 13M€ (TBC) will be proposed at the next ESA Ministerial Conference (end of November) to start preliminary studies with a full program development start by 2011.**
  - **The sharing of responsibility on Jason-CS and the possible cooperation with the U.S. on this program have not been yet addressed.**

- **U.S.**
  - **Approval of NOAA's FY10 budget initiative for the U.S. half of the Jason-3 mission.**

What are the next steps?

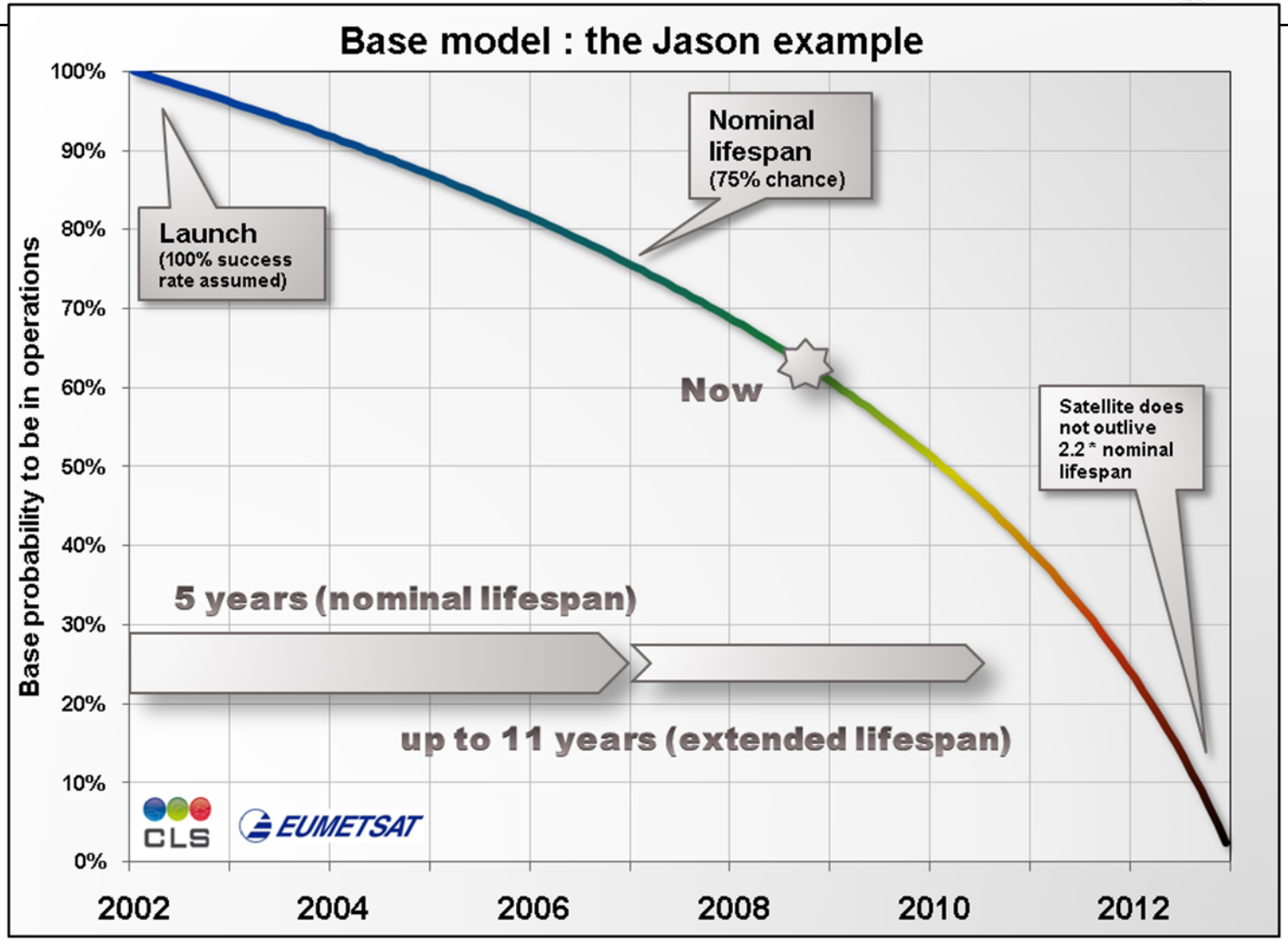
- **Europe**
  - **Some proposals have been made to solve the funding issue through splitting the EC contribution between development cost and operations cost, with a possible additional contribution from ESA, CNES and/or EUM to cover the development cost, but no formal Agreement has been yet found.**
  - **Even if not formally addressed at the next ESA Ministerial Conference, it is hoped that a global agreement can be found, in which case EUM will restart its program approval process.**
- **U.S.**
  - **Jason-3 remains an issue under consideration in NOAA's FY10 budget.**
  - **The FY10 budget – while proposed to the Administration of the current President – will be considered by the Administration of the new President before its submission to the Congress.**
  - **When the new President's Transition Team first arrives at the Department of Commerce – next Monday – NOAA will continue to emphasize the importance of extending the time series with Jason-3.**

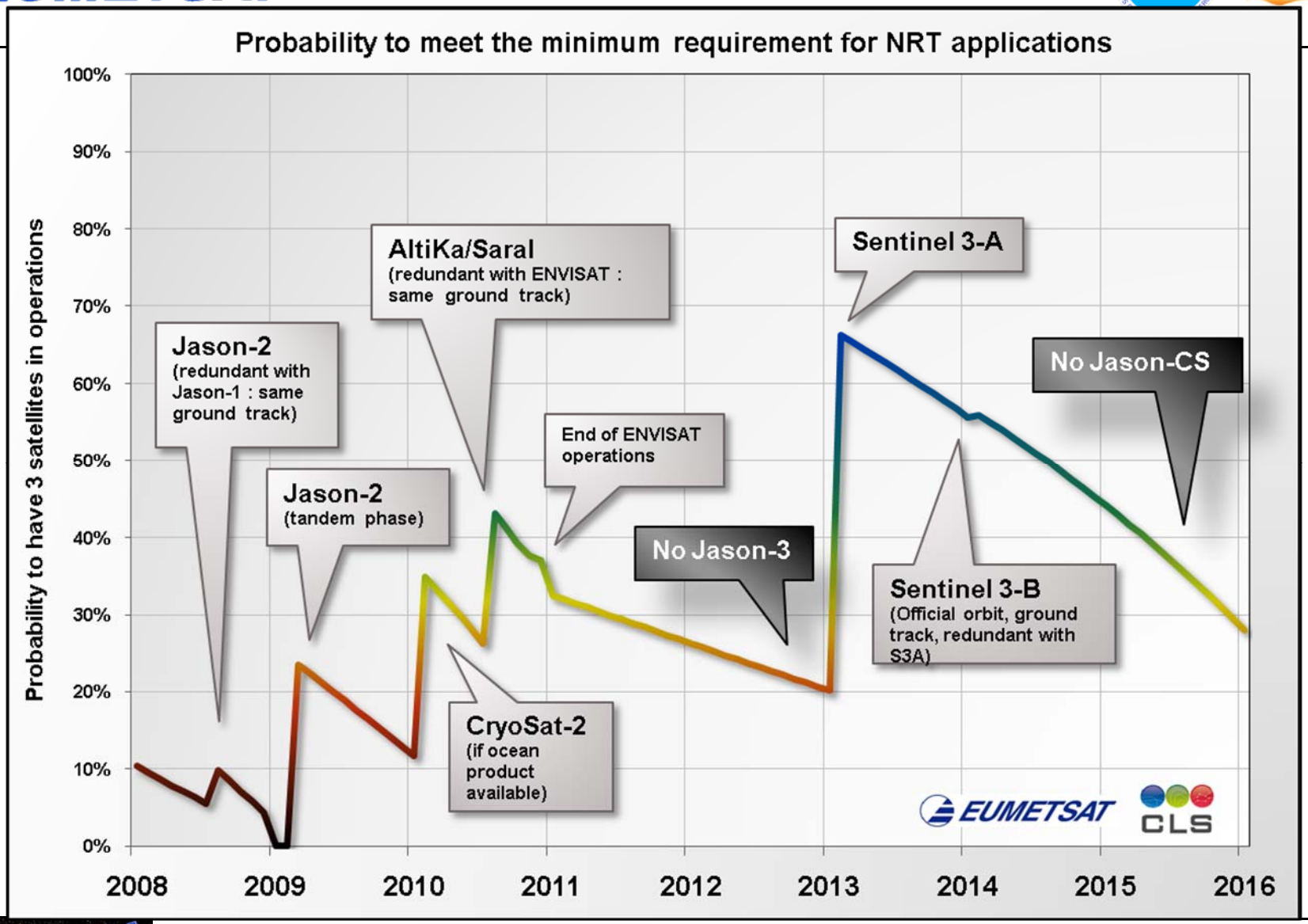
The consequences

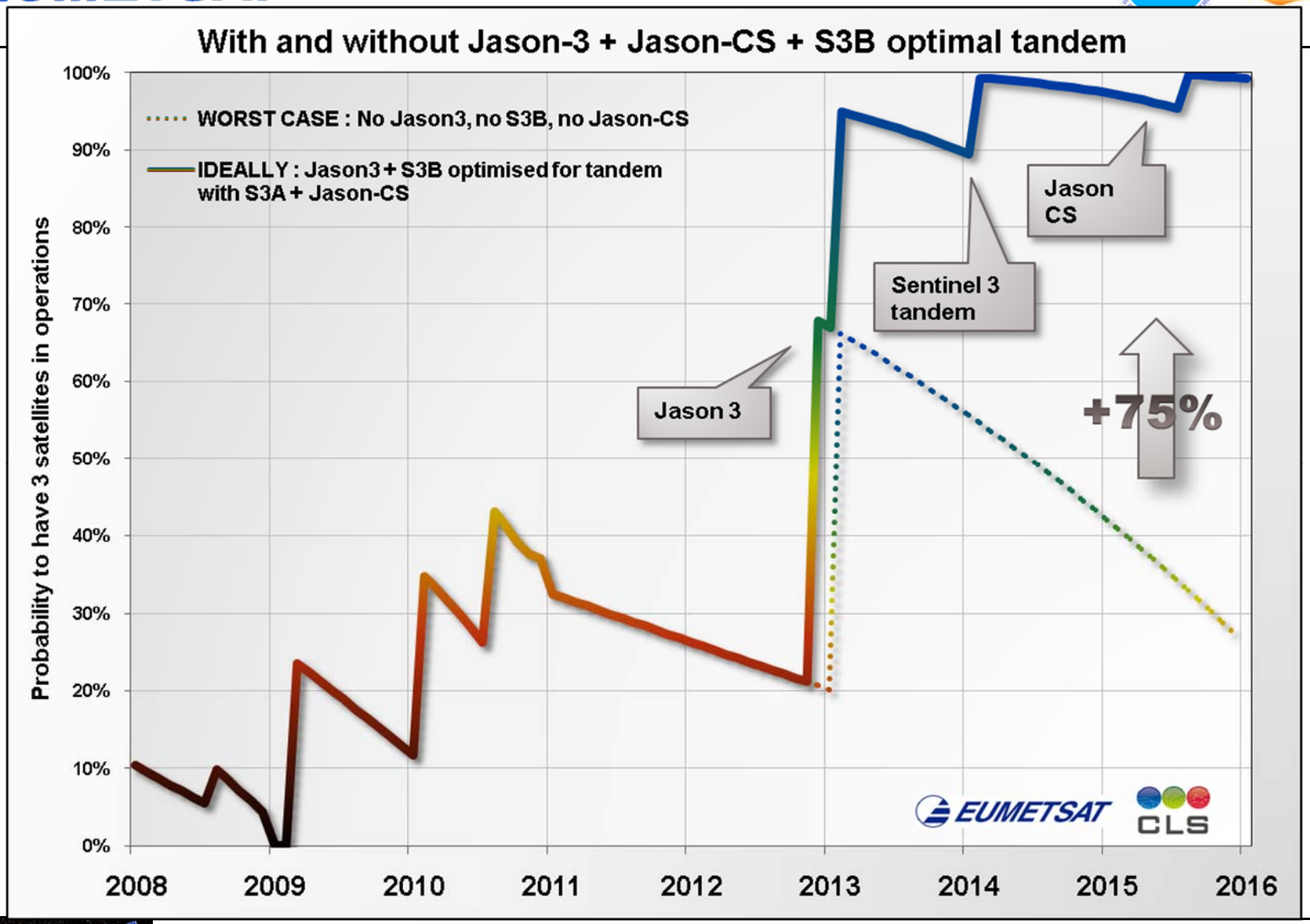
- **Today and in the coming days, you will be considering the duration of the Jason-2 cal/val period and the optimal phasing scenarios between Jason-1 and -2.**
- **There is a high risk that in the coming OSTST meetings, you will have to discuss the impact of a 6-month, 12-month or even longer data gap between Jason-2 and its successor.**
- **Even if a solution is quickly found, it now appears very challenging to have Jason-3 ready for a launch by end of 2012.**

We need a strong show of support on the part of the user community to enable this outstanding U.S.-European collaboration to sustain the unparalleled, high-accuracy time series of sea surface topography!

The strong show of support is needed on both sides of the Atlantic!


Base model : the Jason example
Base probability to be in operations
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2002
2004
2006
2008
2010
2012
Launch
(100% success rate assumed)
Nominal lifespan
(75% chance)
Now
Satellite does not outlive 2.2 * nominal lifespan
5 years (nominal lifespan)
up to 11 years (extended lifespan)
CLS
EUMETSAT

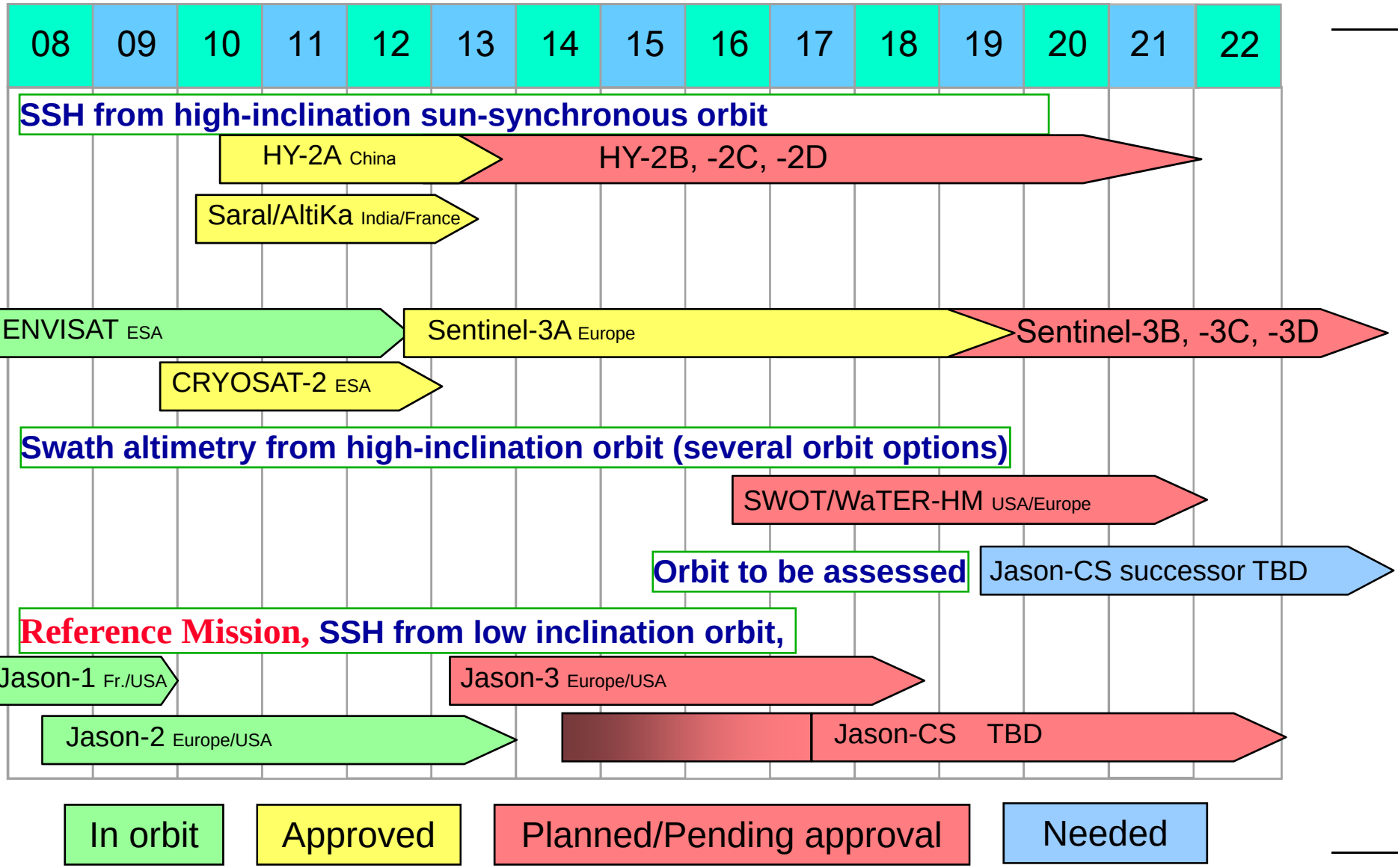

Probability to meet the minimum requirement for NRT applications
Probability to have 3 satellites in operations
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2009
2010
2011
2012
2013
2014
2015
2016
Jason-2
(redundant with Jason-1 : same ground track)
AltiKa/Saral
(redundant with ENVISAT : same ground track)
Sentinel 3-A
No Jason-CS
Jason-2
(tandem phase)
End of ENVISAT operations
No Jason-3
Sentinel 3-B
(Official orbit, ground track, redundant with S3A)
CryoSat-2
(if ocean product available)
EUMETSAT
CLS


With and without Jason-3 + Jason-CS + S3B optimal tandem
WORST CASE : No Jason3, no S3B, no Jason-CS
IDEALLY : Jason3 + S3B optimised for tandem with S3A + Jason-CS
Probability to have 3 satellites in operations
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2008
2009
2010
2011
2012
2013
2014
2015
2016
Jason 3
Sentinel 3 tandem
Jason CS
+75%
EUMETSAT
CLS

The other programs

- **Sentinel 3**
  - **The proposed Sentinel 3 concept is based on EUMETSAT being the operator of the marine mission of Sentinel 3; this includes, after completion of the in-orbit commissioning phase, monitoring and control of spacecraft and flight operation segment, payload data acquisition, and product generation and dissemination.**
  - **Two satellites are planned in the first phase of GMES, but only the first one has been approved. Some uncertainty remains for the second and its launch date.**
- **GFO Follow-on**
  - **U.S. Navy continues to pursue a GFO-like follow-on; funding is pending.**
- **Other altimeter missions**
  - **The CEOS Ocean Surface Topography Constellation is promoting the harmonization of altimetry missions – timely data exchange, common data formats & products, optimal coverage in space & time…**
  - **This includes the above missions as well as SOA HY-2A, CNES/ISRO SARAL…**
- **SWOT**
  - **We will hear about SWOT during this meeting.**

Ocean Surface Topography Constellation Roadmap



On the Situation in the U.S.

- **Peter Baker in the New York Times on Sunday 9 Nov 08:**
  - ***With the economy in disarray and the nation's treasury draining, President-elect Obama and his advisers are trying to figure out which of his expansive campaign promises to push in the opening months of his tenure and which to put on a slower track.***
  - ***Mr. Obama repeated on Saturday that his first priority would be an economic recovery program...***
  - ***His advisers said the question was whether they could tackle health care, climate change and energy independence at once or needed to stagger these initiatives over time.***
  - ***Mr. Obama said "We can't afford to wait on moving forward on the key priorities…including clean energy, health care, education and tax relief for middle class families…"***
  - ***But at the same time, "…none of this can be accomplished if we continue to see a potential meltdown in the banking system or the financial system."***