Potential GlobSnow SE aggregation product

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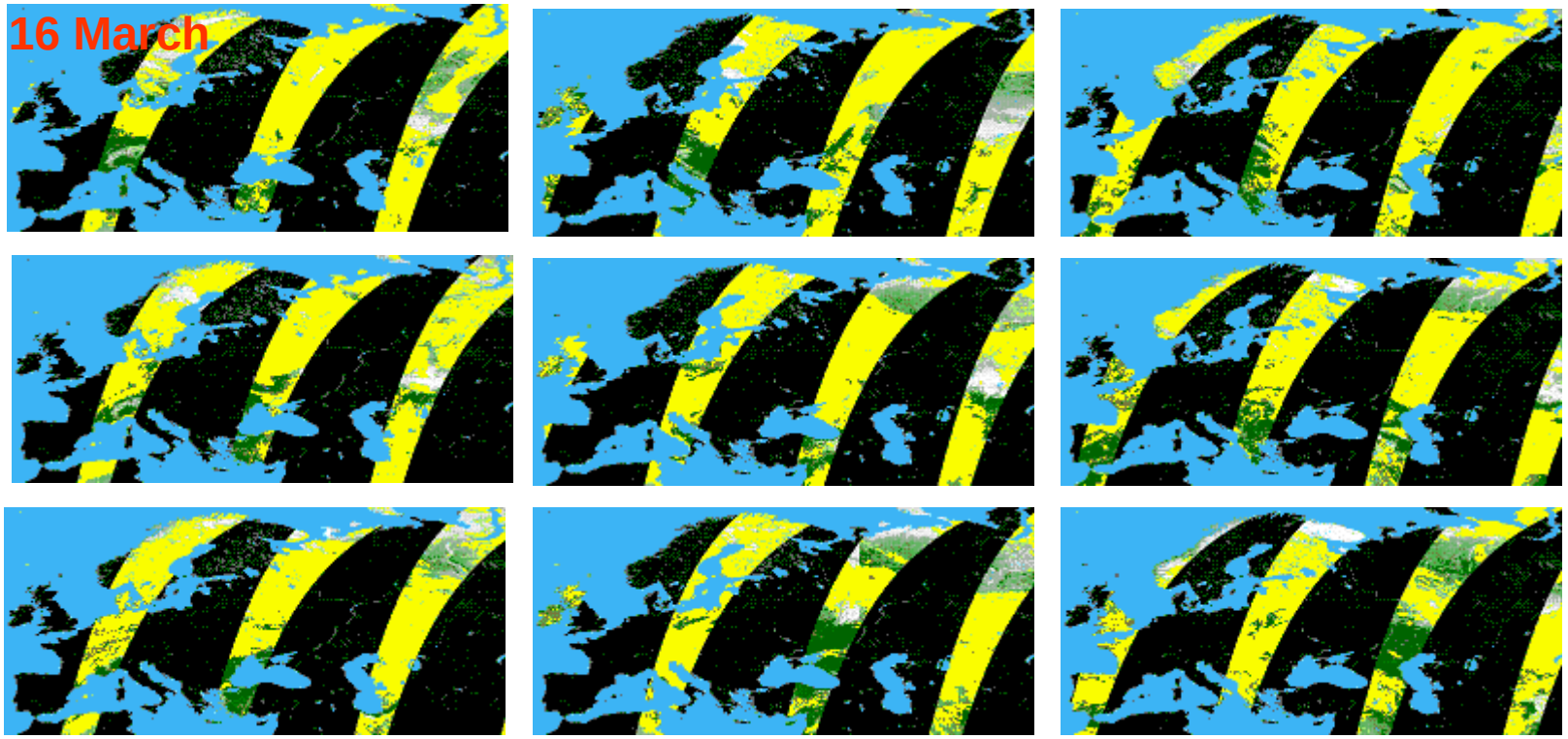
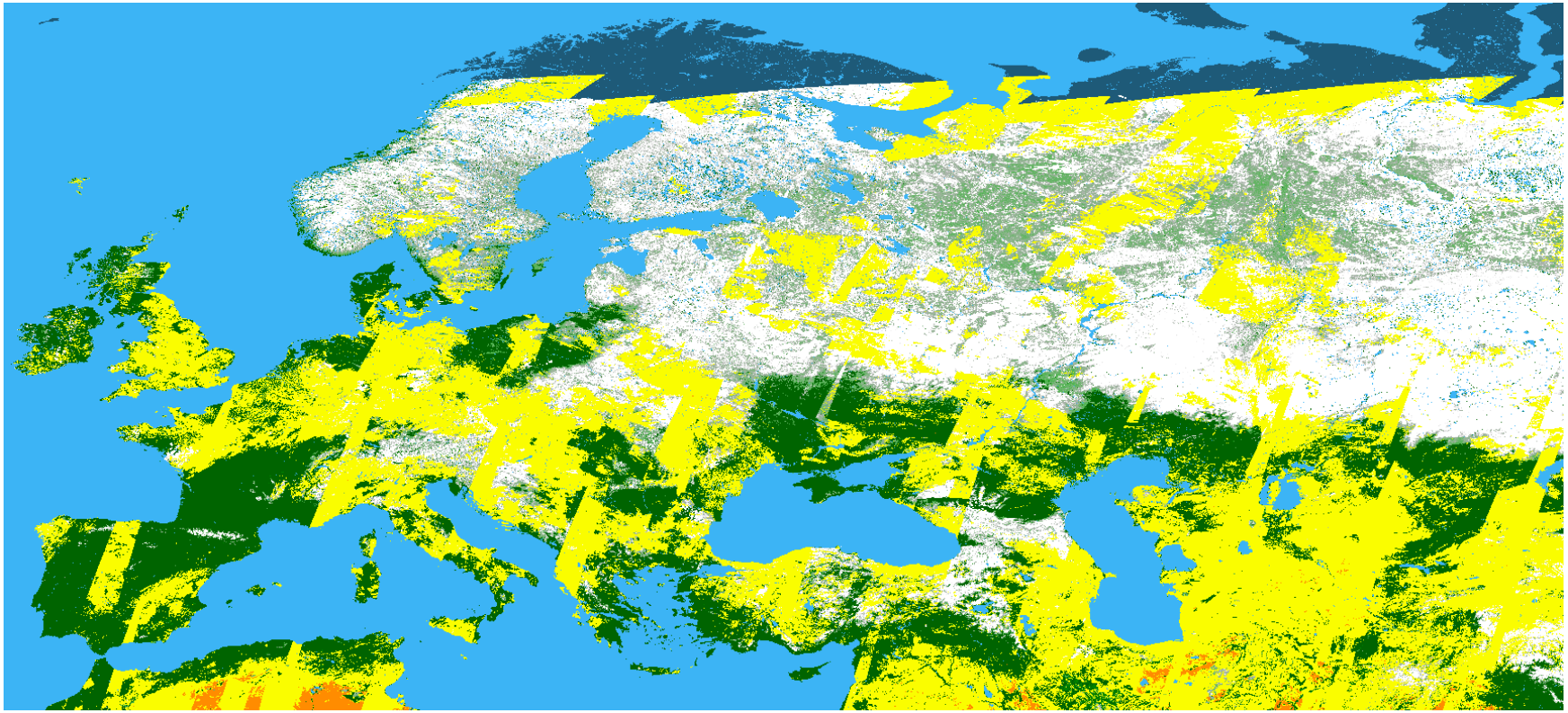
Outline

- **Why an aggregation product?**
- **Examples from GlobSnow SE**
- **Aggregation scheme used so far in GlobSnow**
- **Other aggregation products**
- **The alternatives**
- **GlobSnow SE solution?**

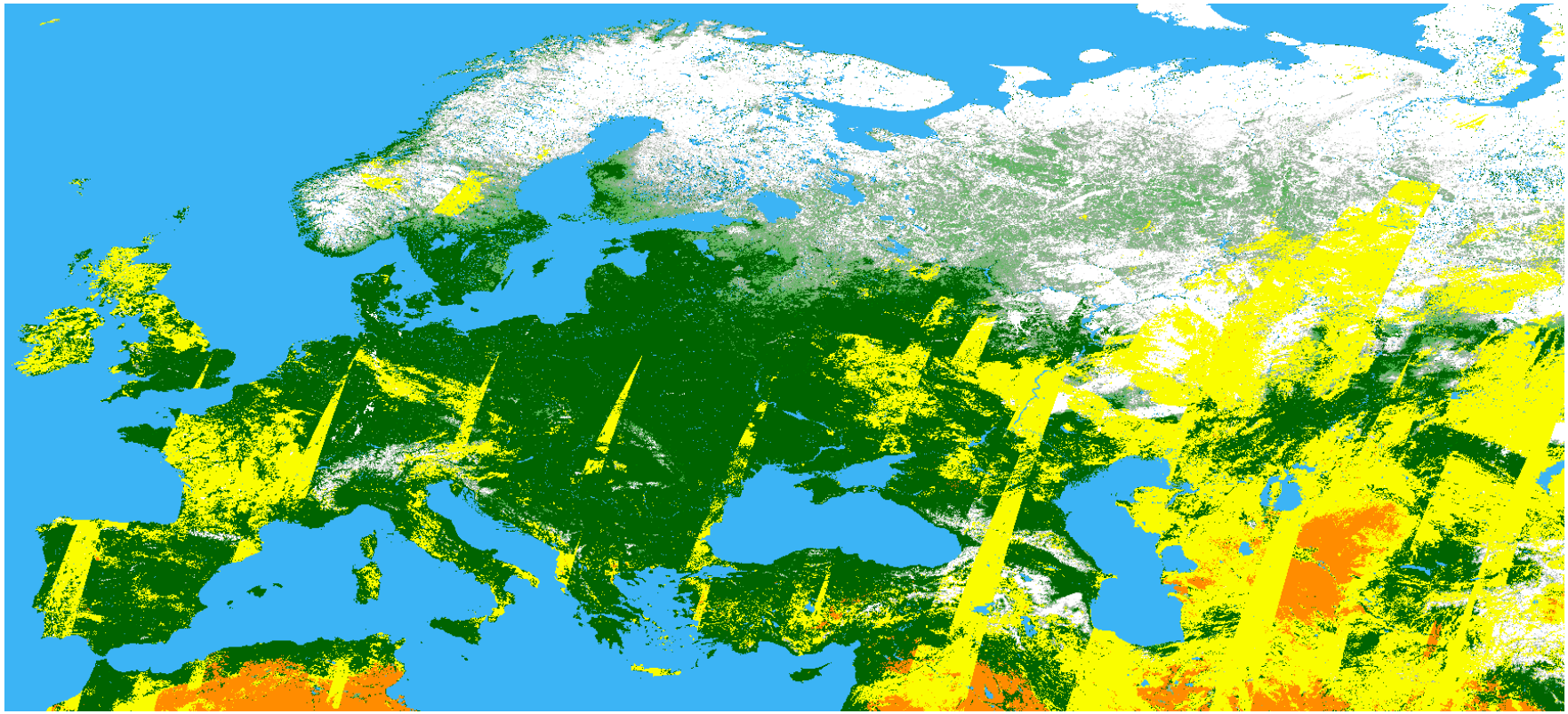
What should aggregated products be?



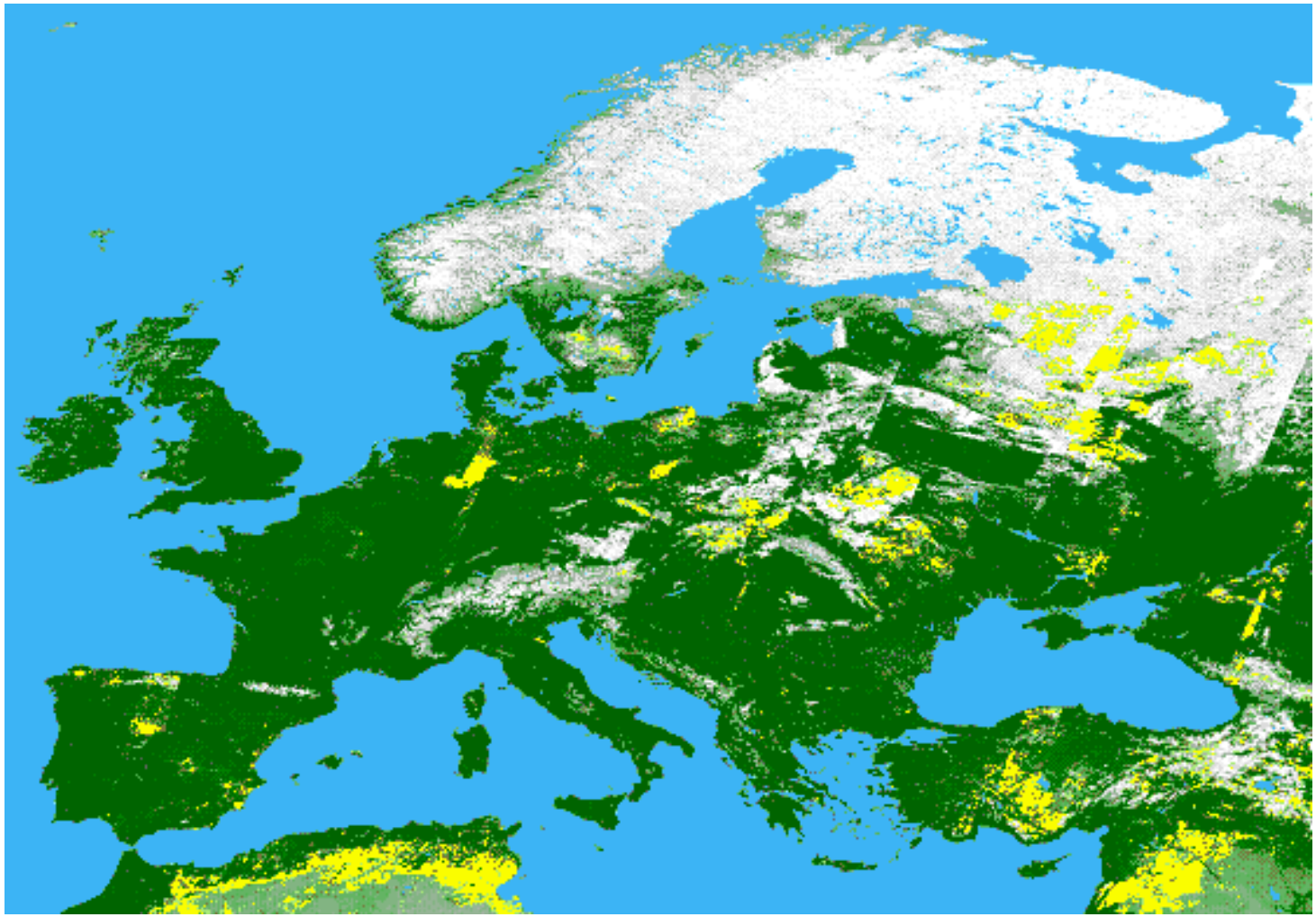
15 March 2004, 10 days sliding window



8 April 2004, 10 days sliding window

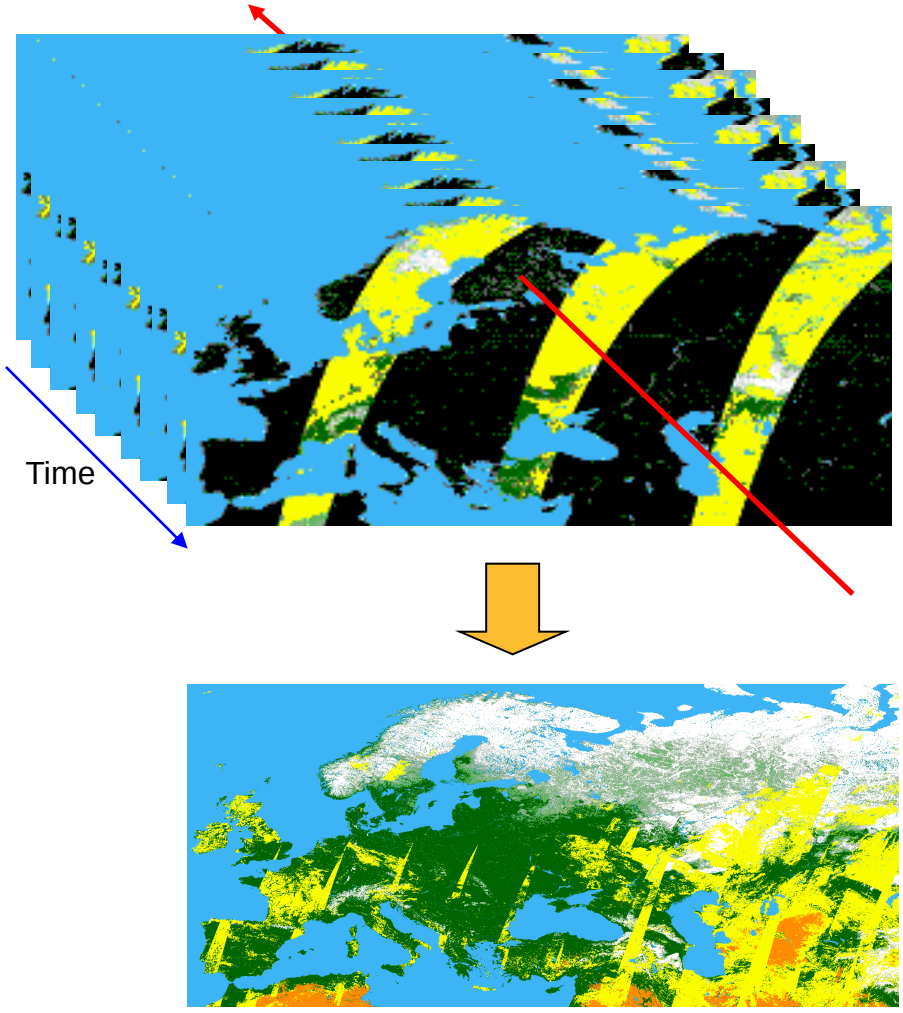


March 2004, Monthly aggregated product



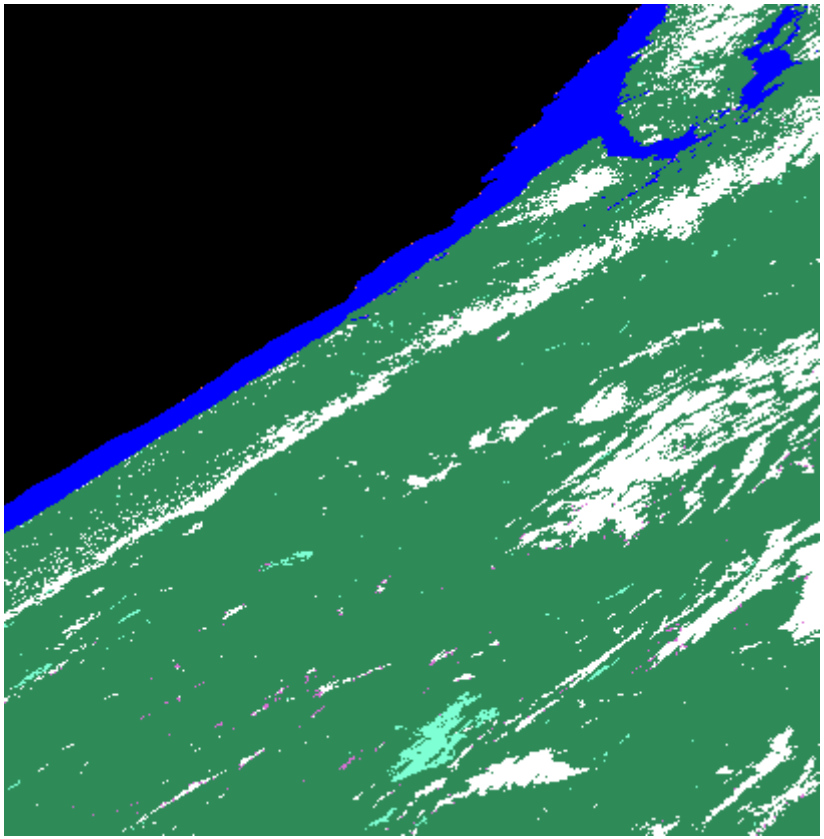
Aggregation scheme used here

- **Algorithm:**
  - Go through the snow map time series data cube pixel by pixel in the time direction
  - For the output, choose the most recent clear sky observation
  - If there are no clear-sky observations for a time row, set output to ‘cloud’ (or ‘water’ or ‘too dark’)
- **Pros:**
  - The least cloud-covered snow map obtainable for the period
  - The most recent observations are shown
- **Cons:**
  - No snapshot in time, mixes observations within the aggregation period



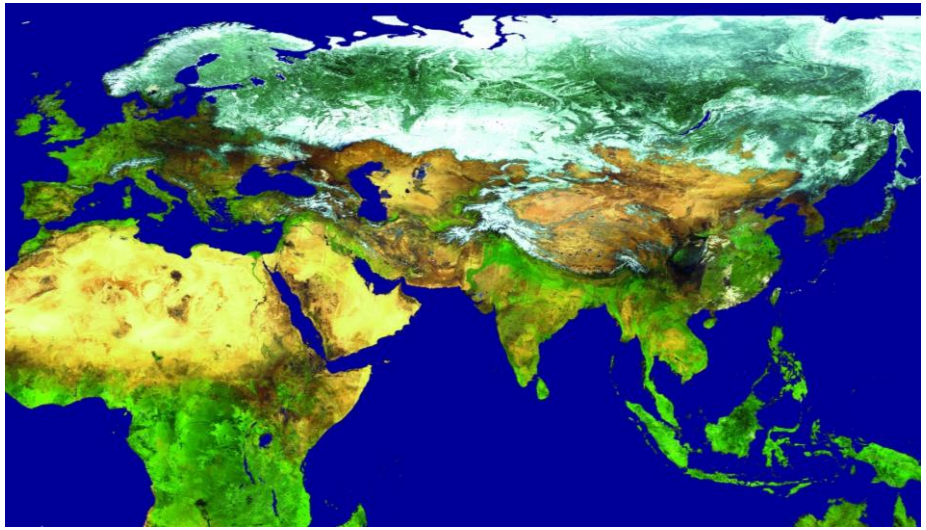
NASA’s 8-day snow cover product

- **Algorithm:**
  - Same as we apply, except that maximum FSC is chosen rather than most recent observation
- **Pros:**
  - The least cloud-covered snow map obtainable for the period
  - Shows a definite observed value (the maximum) rather than a ‘random’ with respect to observed value
- **Cons:**
  - No snapshot in time, mixes observations within the aggregation period



SPOT VEGETATION 10-day composite

- **Algorithm:**
  - Exact algorithm not known, but a best average (of reflectance) for ten days is made by a combination of observations and estimates
- **Pros:**
  - Cloud-free ‘map’
- **Cons:**
  - Snow fraction is not retrieved; this is an image product
  - The use of estimated values is questionable concerning climate monitoring



What are our alternatives?

- **Which variable to show from the time cube of data:**
  - The most recent observation?
  - The maximum snow extent observed?
  - The minimum snow extent observed?
  - The average snow extent observed?
- **Limitations:**
  - Full coverage north of about 30° requires at least ten days of observations
  - Some variability in actual snow cover must be expected within such a time window during periods in the autumn and spring
- **Is supplemental data the solution?**
  - Number of snow observations in the period per pixel?
  - Date of first snow observation in the period?
  - Date of last snow observation in the period?
  - All dates of actual snow observations?

The GlobSnow SE solution?

- **Which variable to show from the time cube of data:**
  - The average snow extent observed
    - Because it is most representative for the period
- **Aggregation period:**
  - ~10 days (could also be 15 days / 0.5 month):
    - Full coverage north of about 30° requires at least ten days of observations
    - 10 days cover most of the snow-covered part of the northern hemisphere
- **Supplemental data:**
  - Number of snow observations in the period per pixel
  - Day of first snow observation in the period
  - Day of last snow observation in the period

Also a monthly product?

- **Which variable to show from the time cube of data:**
  - The average snow extent observed
    - Because it is most representative for the period
- **Aggregation period:**
  - 1 month:
    - Full spatial coverage a few times
    - Very little cloud cover
- **Supplemental data:**
  - Number of snow observations in the period per pixel
  - Day of first snow observation in the period
  - Day of last snow observation in the period

User opinions?

- **What are the actual user needs concerning an aggregated product?**