Comments from Public Consultation on ECV Requirements 13/01 – 13/03 2020 for:

# Ice sheets and ice shelves

## ECV Product: Grounding Line Location and Thickness

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Grounding Line Location and Thickness | | | | |
| **Definition** | Location of the line (zone) where ice outflow to an ocean begins to float, and thickness of ice at that location | | | | |
| **Unit** | Thickness in m, coordinates of location | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m |  | G |  |  |
| B |  |  |
| T | 100 |  |
| **Vertical Resolution** | N/A | 2d coordinates of grounding line | G |  |  |
| B |  |  |
| T | 10 |  |
| **Temporal Resolution** |  |  | G |  |  |
| B |  |  |
| T | 1 year |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | m | Position and thickness | G |  |  |
| B |  |  |
| T | 10 |  |
| **Stability** | m | Position and thickness | G |  |  |
| B |  |  |
| T | 1 |  |
| **Standards and References** |  | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  |  | | |
| **Extremes[3]** |  |  |  | | |

[1]Goal (G); Breakthrough (B)(not mandatory, more as one possible); Threshold (T), for definitions see [Guidelines](http://tiny.cc/ecv-review)

[2] Is the ECV Product directly relevant to support Climate Adaptation?

[3] Can the ECV Product be used to monitor climate extremes or aspects of extremes?

### Comment 1

|  |  |
| --- | --- |
| Author: ECMWF | Email: ecresgcosreqs@gmail.com |
| For NWP and reanalysis requirements at ECMWF, horizontal resolution of 1 km, with an uncertainty of about 1m, adapted once a year would allow us to update our climatological input data adequately, like land-sea masks and surface elevation. | |

## ECV Product: Ice Volume Change

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Ice Volume Change | | | | |
| **Definition** | Direct measurement of local mass changes or inferred mass change from combining measurements | | | | |
| **Unit** | 10km3/year | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km | Size of grid cell | G |  |  |
| B |  |  |
| T | 50 |  |
| **Vertical Resolution** | N/A | One value per point of Earth’s surface | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  | time | G | 30 days |  |
| B |  |  |
| T | 1 year |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | km3/year | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 10 |  |
| **Stability** | 10km3/year | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 1 |  |
| **Standards and References** |  | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  |  | | |
| **Extremes[3]** |  |  |  | | |

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NO COMMENT

## ECV Product: Ice Velocity

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Ice Velocity | | | | |
| **Definition** | Surface-parallel vector of the surface ice flow | | | | |
| **Unit** | ms-1 – average speed in grid cell of surface ice flow | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Grid cell size | G |  |  |
| B |  |  |
| T | 100 |  |
| **Vertical Resolution** | N/A | One value per point of Earth’s surface | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  | time | G | 30 days |  |
| B |  |  |
| T | 1 year |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | ms-1 | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 0.1 |  |
| **Stability** | ms-1 | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 0.01 |  |
| **Standards and References** |  | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  |  | | |
| **Extremes[3]** |  |  |  | | |

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### Comment 1

|  |  |
| --- | --- |
| Author: Jan Wuite | Email: jan.wuite@gmail.com |
| The unit for ice surface velocity should be adjusted, it is either m/day or else m/yr not m/s. | |

### Comment 2

|  |  |
| --- | --- |
| Author: Jan Wuite | Email: jan.wuite@gmail.com |
| As part of the ESA Ice Sheets CCI (Greenland+Antarctica) user requirements for icesheet ECV were identified through an extensive user survey within the glaciology community. From this survey for ice velocity the minimum (Threshold) spatial resolution was 100m-1km with an optimum (Goal) spatial resolution of 50m-100m, and the minimum accuracy 30-100 m/y (0.08-0.27 m/d) with an optimum accuracy of 10-30 m/y (0.03-0.08 m/d).  References:  Hvidberg, C.S., et al., User Requirements Document for the Ice\_Sheets\_cci project of ESA's Climate Change Initiative, version 1.5, 03 Aug 2012.  http://esa-icesheets-greenland-cci.org/index.php?q=webfm\_send/19  Hvidberg, C.S., et al., User Requirements Document (URD) for the Greenland\_Ice\_Sheet\_cci project of ESA's Climate Change Initiative, version 2.4, 2017-11-22  http://esa-icesheets-greenland-cci.org/index.php?q=webfm\_send/169 | |

### Comment 3

|  |  |
| --- | --- |
| Author: Jan Wuite | Email: jan.wuite@gmail.com |
| In follow up of my previous comment, I suspect the numbers for uncertainty/stability do not refer to the unit listed (m/s). | |

## ECV Product: Click here to enter text.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Surface Elevation Change | | | | |
| **Definition** | Local measurements of the height above a reference (geoid or ellipsoid) of the snow-air surface or uppermost firn layers | | | | |
| **Unit** | Annual change in elevations above sea level measured in meters (m/year) | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Spacing of measurements | G |  |  |
| B |  |  |
| T | 100 |  |
| **Vertical Resolution** | N/A | One value per point of Earth’s surface | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  | time | G | 30 days |  |
| B |  |  |
| T | 1 year |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | m a‐1 | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 0.1 |  |
| **Stability** | m a‐1 | error of measured in‐situ using the geodetic method and remotely sensed surface elevation. | G |  |  |
| B |  |  |
| T | 0.01 |  |
| **Standards and References** |  | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  |  | | |
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NO COMMENT