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

# Soil carbon

## ECV Product: Peatlands total depth of profile, area and location

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Peatlands total depth of profile, area and location | | | | |
| **Definition** | Geographic extent of peatlands and depth of peat at intervals (20 m)  within the peatlands | | | | |
| **Unit** |  | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Grid cell size | G | 20 |  |
| B |  |  |
| T |  |  |
| **Vertical Resolution** | m |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Years | Time between estimates | G | 10 |  |
| B |  |  |
| T | 5 |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | % | 2 Sd | G | 10 |  |
| B |  |  |
| T |  |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **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?

NO COMMENT

## ECV Product: Mineral soil bulk density to 30 cms and 1m

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Mineral soil bulk density to 30 cms and 1m | | | | |
| **Definition** | Bulk density of dry soil averaged over the topmost 30 cm and topmost 1 m, kg/m3 | | | | |
| **Unit** |  | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km | Grid cell size | G | 20 |  |
| B |  |  |
| T |  |  |
| **Vertical Resolution** | N/a |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Years | Time between estimates | G | 10 |  |
| B |  |  |
| T | 5 |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | % | 2 Sd | G | 10 |  |
| B |  |  |
| T |  |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **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: Annett Bartsch | Email: Annett.Bartsch@polarresearch.at |
| Soil physical characteristics are crucial related to permafrost. Spatial resolution requirements are doumented in NRC (2014):  1-5 m local scale,  100-1000 m circumpolar  National Research Council (2014). Opportunities to Use Remote Sensing in Understanding Permafrost and Related Ecological Characteristics: Report of a Workshop. Washington, DC: The National Academies Press. https://doi.org/10.17226/18711. | |

## ECV Product: Carbon in Soil

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Carbon in Soil | | | | |
| **Definition** | % of organic carbon in the topmost 30 cm | | | | |
| **Unit** | Mass % | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km | Grid cell size | G | 20 |  |
| B |  |  |
| T |  |  |
| **Vertical Resolution** | N/a |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Years | Time between estimates | G | 10 |  |
| B |  |  |
| T | 5 |  |
| **Timeliness** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Required Measurement Uncertainty** | % | 2 Sd | G | 10 |  |
| B |  |  |
| T |  |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **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 |
| -Vertical resolution: both topsoil (0-30cm) and subsoil (30-100cm) are required to estimate the carbon stock in soils and the resulting emissions (CO2 and CH4).  -Current horizontal resolution from Harmonized World Soil Database (HWSD) developed by FAO/IIASA is about 1km. High resolution is required to represent soil type heterogeneity.  -Soil carbon observation data are used to evaluate Earth System Models (e.g. Anav et al., 2013, doi:10.1175/JCLI-D-12-00417.1) and parameterizations of soil processes which produce in CO2 and CH4 emissions into the atmosphere (e.g. Wieder et al, 2013, Nature Climate Change; Oertel et al., 2016, doi:10.1016/j.chemer.2016.04.002).  -Annual temporal resolution consistently with land use change.  -Largest uncertainty of soil carbon measurements comes from soil bulk density (Anan et al., 2013, Todd-Brown et al., 2014, doi:10.5194/bg-11-2341-2014).  -Timeliness: For use in CO2 NRT analysis and re-analysis (estimation of biogenic CO2 and CH4 fluxes from soil/wetlands) and evaluation of ESMs (eg. CMIP runs).  -Soil carbon is linked to soil degradation and soil restoration and therefore it can play an important role in climate change extremes by increasing GHG emissions to the atmosphere (e.g. peat degradation) and adaptation/mitigation in the efforts to restore soils (as they have a large capacity of carbon storage).  -References:  Nachtergaele, F.H., van Velthuizen, L. Verekst, and D. Widberg, Eds., 2012: Harmonized World Soil Database v1.2.  Wieder et al, 2013, Nature Climate Change;  Oertel et al., 2016, doi:10.1016/j.chemer.2016.04.002  Anan et al., 2013, nan et al., 2013, Todd-Brown et al., 2014, doi:10.5194/bg-11-2341-2014  Todd-Brown et al., 2014, doi:10.5194/bg-11-2341-2014 | |

### Comment 2

|  |  |
| --- | --- |
| Author: Annett Bartsch | Email: Annett.Bartsch@polarresearch.at |
| Soil carbon is crucial related to permafrost. Spatial resolution requirements are doumented in NRC (2014):  1-5 m local scale,  100-1000 m circumpolar  National Research Council (2014). Opportunities to Use Remote Sensing in Understanding Permafrost and Related Ecological Characteristics: Report of a Workshop. Washington, DC: The National Academies Press. https://doi.org/10.17226/18711. | |