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

# Ocean nutrients

## ECV Product: Silicate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Silicate | | | | |
| **Definition** | Concentration of Si(OH)₄ in the water column | | | | |
| **Unit** | μmol kg⁻¹ | | | | |
| **Note** | The availability of nutrients in seawater is estimated from measurements of concentration of inorganic macronutrients: nitrate (NO₃), phosphate (PO₄), silicic acid (Si(OH)₄), ammonium (NH₄), and nitrite (NO₂), expressed in umol kg⁻¹ of seawater. Nutrients ECV products are primarily obtained from discrete sample measurements using analytical chemical methods (colorimetric reactions) but nitrate concentration is also measured by sensors using the ultraviolet absorption method. Linear combination of nitrate and phosphate, defined as N\*, and the difference between silicic acid and nitrate concentrations, Si\*, provide estimates of nutrient supply/removal relative to global Redfield stoichiometry and are widely used for mapping and detecting trends in global nutrient cycling. | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 1000  Coastal: 0.1-100 |  |
| B |  |  |
| T | 2000  Coastal: 100 |  |
| **Vertical Resolution** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  |  | G | seasonal |  |
| B |  |  |
| T | decadal |  |
| **Timeliness** | Month |  | G | 6 |  |
| B |  |  |
| T | 12 |  |
| **Required Measurement Uncertainty** | % |  | G | 1 |  |
| B |  |  |
| T | 3 |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Standards and References** | Requirements based on characteristic scales and magnitude of signal of phenomena to observe. See the EOV Specification Sheet for details and references ([www.goosocean.org/eov](http://www.goosocean.org/eov)). | | | | |
| **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: Phosphate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Phosphate | | | | |
| **Definition** | Concentration of PO₄ in the water column | | | | |
| **Unit** | μmol kg⁻¹ | | | | |
| **Note** | The availability of nutrients in seawater is estimated from measurements of concentration of inorganic macronutrients: nitrate (NO₃), phosphate (PO₄), silicic acid (Si(OH)₄), ammonium (NH₄), and nitrite (NO₂), expressed in umol kg⁻¹ of seawater. Nutrients ECV products are primarily obtained from discrete sample measurements using analytical chemical methods (colorimetric reactions) but nitrate concentration is also measured by sensors using the ultraviolet absorption method. Linear combination of nitrate and phosphate, defined as N\*, and the difference between silicic acid and nitrate concentrations, Si\*, provide estimates of nutrient supply/removal relative to global Redfield stoichiometry and are widely used for mapping and detecting trends in global nutrient cycling. | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 1000  Coastal: 0.1-100 |  |
| B |  |  |
| T | 2000  Coastal: 100 |  |
| **Vertical Resolution** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  |  | G | seasonal |  |
| B |  |  |
| T | decadal |  |
| **Timeliness** | Month |  | G | 6 |  |
| B |  |  |
| T | 12 |  |
| **Required Measurement Uncertainty** | % |  | G | 1 |  |
| B |  |  |
| T | 3 |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Standards and References** | Requirements based on characteristic scales and magnitude of signal of phenomena to observe. See the EOV Specification Sheet for details and references ([www.goosocean.org/eov](http://www.goosocean.org/eov)). | | | | |
| **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: Nitrate

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Nitrate | | | | |
| **Definition** | Concentration of NO₃ in the water column | | | | |
| **Unit** | μmol kg⁻¹ | | | | |
| **Note** | The availability of nutrients in seawater is estimated from measurements of concentration of inorganic macronutrients: nitrate (NO₃), phosphate (PO₄), silicic acid (Si(OH)₄), ammonium (NH₄), and nitrite (NO₂), expressed in umol kg⁻¹ of seawater. Nutrients ECV products are primarily obtained from discrete sample measurements using analytical chemical methods (colorimetric reactions) but nitrate concentration is also measured by sensors using the ultraviolet absorption method. Linear combination of nitrate and phosphate, defined as N\*, and the difference between silicic acid and nitrate concentrations, Si\*, provide estimates of nutrient supply/removal relative to global Redfield stoichiometry and are widely used for mapping and detecting trends in global nutrient cycling. | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 1000  Coastal: 0.1-100 |  |
| B |  |  |
| T | 2000  Coastal: 100 |  |
| **Vertical Resolution** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** |  |  | G | seasonal |  |
| B |  |  |
| T | decadal |  |
| **Timeliness** | Month |  | G | 6 |  |
| B |  |  |
| T | 12 |  |
| **Required Measurement Uncertainty** | % |  | G | 1 |  |
| B |  |  |
| T | 3 |  |
| **Stability** |  |  | G |  |  |
| B |  |  |
| T |  |  |
| **Standards and References** | Requirements based on characteristic scales and magnitude of signal of phenomena to observe. See the EOV Specification Sheet for details and references ([www.goosocean.org/eov](http://www.goosocean.org/eov)). | | | | |
| **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: David Ford | Email: daf.obgc@gmail.com |
| I appreciate only so much can be done with current observing systems, but if the goal value is "The ideal requirement above which further improvements are not necessary", then there are definitely applications which could make use of higher resolution than 1000km seasonally. Many of these are coastal, so I agree with having separate requirements for those applications - in those cases the spatial resolution requirements seem appropriate, but perhaps a similar coastal temporal resolution could be defined - at least monthly, ideally daily. This applies to all nutrients (and many other ocean biogeochemical variables). | |