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

# Surface Wind Speed and Direction

## ECV Product: Wind Direction near Surface

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Wind Direction near Surface | | | | |
| **Definition** | Direction from which wind is blowing at a known height above the surface which is to be specified  in the metadata . | | | | |
| **Unit** | Degree true | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 10 |  |
| B | 25 |  |
| T | 100 |  |
| **Vertical Resolution** | N/A |  | G | N/A | N/A |
| B | N/A | N/A |
| T | N/A | N/A |
| **Temporal Resolution** | hr |  | G | Sub-hourly |  |
| B | 1 |  |
| T | 3 |  |
| **Timeliness** | hr |  | G | 1 |  |
| B | 3 |  |
| T | 24 |  |
| **Required Measurement Uncertainty** | degrees |  | G | 1 |  |
| B | 5 |  |
| T | 10 |  |
| **Stability** | degrees/decade |  | G | 1 |  |
| B | 2 |  |
| T | 5 |  |
| **Standards and References** | Kent, E.C., Rayner, N.A., Berry, D.I., Eastman, R., Grigorieva, V.G., Huang, B., Kennedy, J.J., Smith, S.R. and Willett, K.M., 2019: Observing Requirements for Long-Term Climate Records at the Ocean Surface. Frontiers in Marine Science 6, Article 441, doi:10.3389/fmars.2019.00441. | | | | |
| **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 |
| The stated requirements for spatial and temporal resolution look adequate. The requirements for Measurement Uncertainty look very strict in our view. For instance, scatterometer observations do roughly meet the spatial and temporal requirements, but the accuracy of its wind direction measurements is more in the order of 10 degrees.  For reanalysis and NWP purposes at ECMWF, the goal would be more in the order of 5 degrees.  We have no strict opinion on the required stability. | |

### Comment 2

|  |  |
| --- | --- |
| Author: Wilberforce Kikwasi - Tanzania Met Authority | Email: wkikwasi@gmail.com |
| Spatial and temporal resolutions looks fine especially for monitoring the impact of winds for aviation and marine industry among others. However, the unit for wind direction is suggested to read "degree from true north". | |

### Comment 3

|  |  |
| --- | --- |
| Author: MRI Scnatweb | Email: mountainresearchinitiative@gmail.com |
| In mountain research wind speed and direction are needed for instance for the processes of orographic precipitation, run off and trace gas and aerosol transport. Standard met stations provide raw data in adequate temp resolution but not enough in-situ measurements available in mountain areas. Reanalyses possible also in mountain context.  Based on discussions and preliminary outcomes of the GEO GNOME workshop | |

## ECV Product: Wind Speed near Surface

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Wind Speed near Surface | | | | |
| **Definition** | Speed of air at a known height above the surface which is to be specified in the metadata | | | | |
| **Unit** | m/s | | | | |
| **Note** | Observations made over the ocean are not static, being mostly recorded by mobile ships and drifting buoys (Kent et al., 2019). Requirements for marine surface observations must therefore be defined in terms of the composite accuracy and sampling of the marine observing networks to achieve comparable uncertainty thresholds at similar resolution. | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 10 |  |
| B | 25 |
| T | 100 |
| **Vertical Resolution** | N/A |  | G | N/A | N/A |
| B | N/A | N/A |
| T | N/A | N/A |
| **Temporal Resolution** | hr |  | G | Sub-hourly |  |
| B | 1 |  |
| T | 3 |  |
| **Timeliness** | hr |  | G | 1 |  |
| B | 3 |  |
| T | 24 |  |
| **Required Measurement Uncertainty** | m/s |  | G | 0.1 |  |
| B | 0.5 |  |
| T | 1 |  |
| **Stability** | m/s/decade |  | G | 0.1 |  |
| B | 0.25 | – |
| T | 0.5 |  |
| **Standards and References** | Kent, E.C., Rayner, N.A., Berry, D.I., Eastman, R., Grigorieva, V.G., Huang, B., Kennedy, J.J., Smith, S.R. and Willett, K.M., 2019: Observing Requirements for Long-Term Climate Records at the Ocean Surface. Frontiers in Marine Science 6, Article 441, doi:10.3389/fmars.2019.00441. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  | Reviewers are invited to suggest answers for these fields | | |
| **Extremes[3]** |  |  | Reviewers are invited to suggest answers for these fields | | |

[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: Avner Furshpan | Email: avnerfur@gmail.com |
| Hi,  I understand that for long term and areal climate analysis 10 km and 3 hours resolution of wind speed and direction may be sufficient, but anticipating the demand for a much higher resolution and the current ability to use 1 and 10 minute values I wonder if it is not advisable to require at least 10 min and site.  In climate change there is an interest in extreme wind conditions....  with regards  Avner Furshpan  Director of Climatology  Israel Meteorological Service | |

### Comment 2

|  |  |
| --- | --- |
| Author: Rivo Randrianarison | Email: Herrnews@gmail.com |
| See in Table below | |

- show quoted text -

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Wind Speed near Surface | | | | |
| **Definition** | Speed of air at a known height above the surface which is to be specified in the metadata | | | | |
| **Unit** | m/s | | | | |
| **Note** | Observations made over the ocean are not static, being mostly recorded by mobile ships and drifting buoys (Kent et al., 2019). Requirements for marine surface observations must therefore be defined in terms of the composite accuracy and sampling of the marine observing networks to achieve comparable uncertainty thresholds at similar resolution. | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 10 |  |
| B | 25 |
| T | 100 |
| **Vertical Resolution** | N/A |  | G | N/A | N/A |
| B | N/A | N/A |
| T | N/A | N/A |
| **Temporal Resolution** | hr |  | G | Sub-hourly |  |
| B | 1 |  |
| T | 3 |  |
| **Timeliness** | hr |  | G | 1 |  |
| B | 3 |  |
| T | 24 |  |
| **Required Measurement Uncertainty** | m/s |  | G | 0.1 |  |
| B | 0.5 |  |
| T | 1 |  |
| **Stability** | m/s/decade |  | G | 0.1 |  |
| B | 0.25 | – |
| T | 0.5 |  |
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| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  | Reviewers are invited to suggest answers for these fields | | |
| **Extremes[3]** | Yes |  | Extremes values are crucial for establishing risk/impact assessment | | |

### Comment 3

|  |  |
| --- | --- |
| Author: ECMWF | Email: ecresgcosreqs@gmail.com |
| For the purpose of NWP and reanalysis at ECMWF the requirements for horizontal resolution and timeliness are adequate. For this field of applications, a temporal resolution of about 1 hour would be a sufficient goal.  I do agree with the post by Avner Furshpan, though, that temporal requirements are much higher for the purpose of monitoring extreme wind cases.  The values for measurement uncertainty and stability look appropriate for the application of long-term monitoring. For individual observations uncertainty needs to be less strict. | |

### Comment 4

|  |  |
| --- | --- |
| Author: Wilberforce Kikwasi - Tanzania Met Authority | Email: wkikwasi@gmail.com |
| Spatial and temporal resolutions looks fine especially for monitoring the impact of winds for aviation and marine industry among others. | |

### Comment 5

|  |  |
| --- | --- |
| Author: Michele van Weele | Email: .commvanweele68@gmail.com |
| Hi,  We would suggest adding the maximum wind gust (3 second average wind speed) or standard deviation of the wind speed, measured over the same period as the average wind speed.  If this is done the potential wind speed can be calculated which is the standardized wind speed that would have been measured had the surroundings of the measurement location met the WMO requirement of flat, open (without obstacles within about 1 km) terrain. The raw measurements of wind speed are so sensitive to the surroundings that changes in the wind speed climate say more about the changes around the measurement location than they do about the (undisturbed) wind climate.    Reference (and the references to articles by Wieringa and Verkaik in this reference):  Wever, N (2012), Quantifying trends in surface roughness and the effect on surface wind speed observations, Journal of Geophysical Research: Atmospheres, Volume 117, Issue D11  https://doi.org/10.1029/2011JD017118  best regards,  Andrew Stepek, Michiel van Weele  KNMI, De Bilt, The Netherlands  best | |

## ECV Product: Wind Vector near Surface

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Wind Vector near Surface | | | | |
| **Definition** | Horizontal wind vector, at a known height above the surface which is to be specified  in the metadata | | | | |
| **Unit** | m/s | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | km |  | G | 10 |  |
| B | 25 |  |
| T | 100 |  |
| **Vertical Resolution** | N/A |  | G | N/A | N/A |
| B | N/A | N/A |
| T | N/A | N/A |
| **Temporal Resolution** | hr |  | G | Sub-hourly |  |
| B | 1 |  |
| T | 3 |  |
| **Timeliness** | hr |  | G | 1 |  |
| B | 3 |  |
| T | 24 |  |
| **Required Measurement Uncertainty** | m/s |  | G | 0.1 |  |
| B | 0.5 |  |
| T | 1 |  |
| **Stability** | m/s/decade |  | G | 0.1 |  |
| B | 0.25 |  |
| T | 0.5 |  |
| **Standards and References** | Kent, E.C., Rayner, N.A., Berry, D.I., Eastman, R., Grigorieva, V.G., Huang, B., Kennedy, J.J., Smith, S.R. and Willett, K.M., 2019: Observing Requirements for Long-Term Climate Records at the Ocean Surface. Frontiers in Marine Science 6, Article 441, doi:10.3389/fmars.2019.00441. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** |  |  |  | | |
| **Extremes[3]** |  |  |  | | |

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### Comment 1

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| Author: ECMWF | Email: ecresgcosreqs@gmail.com |
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### Comment 2

|  |  |
| --- | --- |
| Author: Abdullah Kahraman | Email: kahraman@meteogreen.com |
| Near surface winds is important not only for their role within the climate system, but also due to the direct damage they cause, e.g. cases related with convectove storms. For studying extreme events, which we know are very sensitive to changes in climate, I would argue on a higher horizontal and temporal resolution to be defined as "Goal" at least. The most intense windstorms are not observable with current networks due to their scale (downbursts for instance, would need a 1-km and 1-min data at least), and an improvement in the order of one can be discussed (although expensive). This would also help assesing local climate much more realistically, especially regarding regions with complex topography or coasts. | |