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

# Fire

## ECV Product: Burnt area

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Burnt area | | | | |
| **Definition** | Burned area means the area of burned vegetation. X\_area means the horizontal area occupied by X within the grid cell. The extent of an individual grid cell is defined by the horizontal coordinates and any associated coordinate bounds or by a string valued auxiliary coordinate variable with a standard name of region. | | | | |
| **Unit** | m2 | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Minimum mapping unit to which the BA product refers | G | 30 | This resolution is mostly oriented towards regional studies, particularly in those regions were small fires (< 100 ha) have an important share in fire occurrence. The importance of small fires have been evidenced in recent papers (Roteta et al. 2019, among others) |
| B | 250 | Products based on higher resolution MODIS products have shown higher sensitivity to small fires, even though coarse resolution RS  products still miss most small fires (Chuvieco et al. 2018) |
| T | 25.000 | Most climate modelers work at coarse resolution grids, 025 d is the most common.  A recent review of users of RS BA products show that most of them work at this level of detail  (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated by Heil 2019). A good published review of users of BA products can be found in Mouillot et al. 2014 and Chuvieco et al. 2019 |
| **Vertical Resolution** | N/A |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Day | Minimum temporal period to which the BA product refers | G | 1 | Mostly for atmospheric modelers. A questionnaire to atmospheric and carbon modelers done in 2011 suggested 1-2 days (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, but it was recently updated to 1 day or even 6 hours: Heil 2019 |
| B | 10 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 30 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Timeliness** | Day | Days when the BA product is accessible after fires occurred | G | 10 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| B | 120 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 360 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Product Accuracy** | % | Average omission and commission errors | G | 5 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| B | 15 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 25 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Required Measurement Uncertainty** | Accuracy | Standard deviation around the estimated burned area | G | Missing | Missing |
| B |  |  |
| T | Missing | Missing |
| **Stability** | Measures of omission and commission over the available time period | Assessment of whether a monotonic trend exists based on the slope (b) of the relationship between an accuracy measure (m) and time (t). | Some potential metrics of stability have been published in the last few years (Padilla et al. 2014, but it is not yet an international agreement on which one should be more suitable for measuring BA consistency. Padilla et al., proposed using the slope b of change of accuracy per year is estimated through a nonparametric linear regression. In addition, the temporal monotonic trend of accuracy (i.e. b different than zero) is tested with the Kendall’s tau statistic (Conover 1999; Section 5.4). A statistically significant test result would indicate that accuracy measure m presents temporal instability, as it would have a significant increase or decrease over time. | | |
| **Standards and References** | Chuvieco, E., Lizundia-Loiola, J., Pettinari, M.L., Ramo, R., Padilla, M., Tansey, K., Mouillot, F., Laurent, P., Storm, T., Heil, A., & Plummer, S. (2018). Generation and analysis of a new global burned area product based on MODIS 250 m reflectance bands and thermal anomalies. *Earth Systems Science Data, 10*, 2015-2031.  Chuvieco, E., Mouillot, F., van der Werf, G.R., San Miguel, J., Tanasse, M., Koutsias, N., García, M., Yebra, M., Padilla, M., Gitas, I., Heil, A., Hawbaker, T.J., & Giglio, L. (2019). Historical background and current developments for mapping burned area from satellite Earth observation. *Remote Sensing of Environment, 225*, 45-64.  Heil, A. (2019). ESA CCI ECV Fire Disturbance: D1.1 User requirements document, version 6.0. In. Available from: https://[www.esa-fire-cci.org/documents](http://www.esa-fire-cci.org/documents)  Mouillot, F., Schultz, M.G., Yue, C., Cadule, P., Tansey, K., Ciais, P., & Chuvieco, E. (2014). Ten years of global burned area products from spaceborne remote sensing—A review: Analysis of user needs and recommendations for future developments. *International Journal of Applied Earth Observation and Geoinformation, 26*, 64-79.  Padilla, M., Stehman, S.V., Litago, J., & Chuvieco, E. (2014). Assessing the Temporal Stability of the Accuracy of a Time Series of Burned Area Products. *Remote Sensing, 6*, 2050-2068.  Roteta, E., Bastarrika, A., Storm, T., & Chuvieco, E. (2019). Development of a Sentinel-2 burned area algorithm: generation of a small fire database for northern hemisphere tropical Africa *Remote Sensing of Environment, 222*, 1-17. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** | Yes | Yes | Climate changes impact fire regimes, management of prescribed fires should be adapted to new fire scenarios, as well as preventive land use | | |
| **Extremes[3]** | Yes | Yes | Extreme fire events are associated to heat waves and dry periods. These extreme events have been observed more frequently in the last decades | | |

[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: B. Nota | Email: Click here to enter text. |
| A note on the Uncertainty metric for BA products  Until recently efforts to provide uncertainty estimates associated with burnt area products were rare. The ones that do, provide estimates based on probabilities of detection or on a quality type flag. As for other ECVs, the uncertainty of a particular variable should indicate the amount, in the same units of the variable, that is associated with an error margin. But because BA products come in the form of a binary maps, indicating if a pixel is bunt or not, the only possible value for uncertainty is 100%, i.e., the pixel did not burn when it did or burned when it did. Linking the algorithm detection probability with uncertainty can be misleading, as it does not reflect an actual uncertainty in terms of area. Instead it indicates a “detection confidence” and should be referred as such. However in case of aggregated BA products (in degrees of lat/long), the uncertainty of a burnt can be calculated the evaluating the areal outcome difference between higher and lower detection confidence settings. In this case, the uncertainty outcome would be an estimate in area units that reflects, in some way, the sensibility of the algorithm to the initial conditions.  Ideally, uncertainty should be done by tracking the error propagation in all steps of the algorithm. To comply with this rule, future BA product should consider that individual pixels can also not burn entirely. They should be aimed at capturing the % of area that burnt inside of the pixel [in m2]. Instead of asking if a pixel burned or not we should be asking how much did it burnt. By doing so, product uncertainty can then be easily derived from uncertainty propagation in the algorithm. | |

### Comment 2

|  |  |
| --- | --- |
| Author: Chantelle Burton | Email: chantelle.burton@metoffice.gov.uk |
| I agree that a measure of uncertainty for the burnt area products would really improve the use of the data for modelling. It would also be great to move towards the B and even G aims for making burnt area products available soon after fire occurrence to help analysis, in particular for when large fire events occur. Ideally this would include estimates for small scale understory fires as well to improve burnt area and emission information | |

## ECV Product: Active Fires

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Active Fires | | | | |
| **Definition** | Presence of a temporal thermal anomaly within a grid cell. Those thermal anomalies that are permanent should be linked to other sources of thermal emission (volcanos, gas flaring, industrial or power plants). Generally, the active fire maps are defined by the date/hour when the thermal anomaly was detected. | | | | |
| **Unit** | m2 | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Minimum mapping unit to which the AF product refers | G | 50 | This resolution is mostly required by fire managers and fire extinction services |
| B | 200 | Useful for fire risk assessment and better understanding of fire risk factors |
| T | 25.000 | Most climate modelers work at coarse resolution grids, 025 d is the most common.  A recent review of users of RS BA products show that most of them work at this level of detail  (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated by Heil 2019). A good published review of users of BA products can be found in Mouillot et al. 2014 and Chuvieco et al. 2019 |
| **Vertical Resolution** | N/A |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Minutes | Minimum temporal period to which the AF product refers | G | 15 | For fire management purposes, active fire detection should be done very frequently. Atmospheric modelers also require updated information on fire activity |
| B | 120 | Atmospheric modelers |
| T | 1 day | Atmospheric and carbon modelers |
| **Timeliness** | Minutes | Time lapse between satellite overpass and AF availability | G | 10 | Quick information is necessary to use AF as an early warning of fire activity |
| B | 60 | Quick information is necessary to use AF as an early warning of fire activity |
| T | 1 day | Quick information is necessary to use AF for monitoring  fire activity |
| **Product Accuracy** | % | Average omission and commission errors | G | 5 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| B | 15 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 25 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Required Measurement Uncertainty** | Accuracy | Standard error of fire detection | G | Missing | Missing |
| B | Missing | Missing |
| T | Missing | Missing |
| **Stability** | Measures of omission and commission over the available time period | Assessment of whether a monotonic trend exists based on the slope (b) of the relationship between an accuracy measure (m) and time (t). | Some potential metrics of stability have been published in the last few years (Padilla et al. 2014, but it is not yet an international agreement on which one should be more suitable for measuring BA consistency. Padilla et al., proposed using the slope b of change of accuracy per year is estimated through a nonparametric linear regression. In addition, the temporal monotonic trend of accuracy (i.e. b different than zero) is tested with the Kendall’s tau statistic (Conover 1999; Section 5.4). A statistically significant test result would indicate that accuracy measure m presents temporal instability, as it would have a significant increase or decrease over time. | | |
| **Standards and References** | Chuvieco, E., Lizundia-Loiola, J., Pettinari, M.L., Ramo, R., Padilla, M., Tansey, K., Mouillot, F., Laurent, P., Storm, T., Heil, A., & Plummer, S. (2018). Generation and analysis of a new global burned area product based on MODIS 250 m reflectance bands and thermal anomalies. *Earth Systems Science Data, 10*, 2015-2031.  Chuvieco, E., Mouillot, F., van der Werf, G.R., San Miguel, J., Tanasse, M., Koutsias, N., García, M., Yebra, M., Padilla, M., Gitas, I., Heil, A., Hawbaker, T.J., & Giglio, L. (2019). Historical background and current developments for mapping burned area from satellite Earth observation. *Remote Sensing of Environment, 225*, 45-64.  Heil, A. (2019). ESA CCI ECV Fire Disturbance: D1.1 User requirements document, version 6.0. In. Available from: https://[www.esa-fire-cci.org/documents](http://www.esa-fire-cci.org/documents)  Mouillot, F., Schultz, M.G., Yue, C., Cadule, P., Tansey, K., Ciais, P., & Chuvieco, E. (2014). Ten years of global burned area products from spaceborne remote sensing—A review: Analysis of user needs and recommendations for future developments. *International Journal of Applied Earth Observation and Geoinformation, 26*, 64-79.  Padilla, M., Stehman, S.V., Litago, J., & Chuvieco, E. (2014). Assessing the Temporal Stability of the Accuracy of a Time Series of Burned Area Products. *Remote Sensing, 6*, 2050-2068.  Roteta, E., Bastarrika, A., Storm, T., & Chuvieco, E. (2019). Development of a Sentinel-2 burned area algorithm: generation of a small fire database for northern hemisphere tropical Africa *Remote Sensing of Environment, 222*, 1-17. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** | Yes | Yes | Climate changes impact fire regimes, management of prescribed fires should be adapted to new fire scenarios, as well as preventive land use | | |
| **Extremes[3]** | Yes | Yes | Extreme fire events are associated to heat waves and dry periods. These extreme events have been observed more frequently in the last decades | | |

[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: Combustion completeness (CC) / also termed Burning efficiency (BE)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Combustion completeness (CC) / also termed Burning efficiency (BE) | | | | |
| **Definition** | Proportion of pre-fire biomass consumed by the fire. | | | | |
| **Unit** | unitless | | | | |
| **Note** | This variable is a requisite for estimating fire emissions. Currently is based on weather data as a proxy of fire severity and CC, or is estimated based on controlled fires, which rarely described real burning conditions.  The requirements are similar to burned area, since CC is another component to estimate fire emissions using bottom-up approaches | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Minimim mapping unit to which the BA product refers | G | 30 | This resolution is mostly oriented towards regional studies, particularly in those regions were small fires (< 100 ha) have an important share in fire occurrence. The importance of small fires have been evidenced in recent papers (Roteta et al. 2019, among others) |
| B | 250 | Products based on higher resolution MODIS products have shown higher sensitivity to small fires, even though coarse resolution RS  products still miss most small fires (Chuvieco et al. 2018) |
| T | 25.000 | Most climate modelers work at coarse resolution grids, 025 d is the most common.  A recent review of users of RS BA products show that most of them work at this level of detail  (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated by Heil 2019). A good published review of users of BA products can be found in Mouillot et al. 2014 and Chuvieco et al. 2019 |
| **Vertical Resolution** | N/A |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Day | Minimum temporal period to which the CC product refers | G | 1 | Mostly for atmospheric modelers. A questionnaire to atmospheric and carbon modelers done in 2011 suggested 1-2 days (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, but it was recently updated to 1 day or even 6 hours: Heil 2019 |
| B | 10 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 30 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Timeliness** | Day | Days when the CC product is accessible after fires occurred | G | 10 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| B | 120 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| T | 360 | Based on a questionnaire to atmospheric and carbon modelers done in 2011:  <https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated in Heil 2019 |
| **Product Accuracy** | unitless | Average deviation between estimated and observed CC | G | Missing | Missing |
| B | Missing | Missing |
| T | Missing | Missing |
| **Required Measurement Uncertainty** | Accuracy | Standard deviation around the estimated  CC | G | Missing | Missing |
| B | Missing | Missing |
| T | Missing | Missing |
| **Stability** | Measures of accuracy over the available time period | Assessment of whether a trends | Similar to those used for burned area | | |
| **Standards and References** | Chuvieco, E., Lizundia-Loiola, J., Pettinari, M.L., Ramo, R., Padilla, M., Tansey, K., Mouillot, F., Laurent, P., Storm, T., Heil, A., & Plummer, S. (2018). Generation and analysis of a new global burned area product based on MODIS 250 m reflectance bands and thermal anomalies. *Earth Systems Science Data, 10*, 2015-2031.  Chuvieco, E., Mouillot, F., van der Werf, G.R., San Miguel, J., Tanasse, M., Koutsias, N., García, M., Yebra, M., Padilla, M., Gitas, I., Heil, A., Hawbaker, T.J., & Giglio, L. (2019). Historical background and current developments for mapping burned area from satellite Earth observation. *Remote Sensing of Environment, 225*, 45-64.  Heil, A. (2019). ESA CCI ECV Fire Disturbance: D1.1 User requirements document, version 6.0. In. Available from: https://[www.esa-fire-cci.org/documents](http://www.esa-fire-cci.org/documents)  Mouillot, F., Schultz, M.G., Yue, C., Cadule, P., Tansey, K., Ciais, P., & Chuvieco, E. (2014). Ten years of global burned area products from spaceborne remote sensing—A review: Analysis of user needs and recommendations for future developments. *International Journal of Applied Earth Observation and Geoinformation, 26*, 64-79.  Padilla, M., Stehman, S.V., Litago, J., & Chuvieco, E. (2014). Assessing the Temporal Stability of the Accuracy of a Time Series of Burned Area Products. *Remote Sensing, 6*, 2050-2068.  Roteta, E., Bastarrika, A., Storm, T., & Chuvieco, E. (2019). Development of a Sentinel-2 burned area algorithm: generation of a small fire database for northern hemisphere tropical Africa *Remote Sensing of Environment, 222*, 1-17. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** | Yes | Yes | Climate changes impact fire regimes, and CC is one of the components | | |
| **Extremes[3]** | Yes | Yes | Extreme fire events will impact CC, as the more severe fires will tend to create higher CC values | | |

[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: Chantelle Burton | Email: chantelle.burton@metoffice.gov.uk |
| Information on combustion completeness is important for calculating emissions. It would be good if this could also be linked to mortality rates to understand the impact on vegetation, recovery, carbon stores etc. | |

## ECV Product: Fire Radiative Power (FRP)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | Fire Radiative Power (FRP) | | | | |
| **Definition** | Amount of energy released by area unit. Commonly it is expressed in W/m2. This variable is a function of actual temperature of the active fire at the satellite overpass and the proportion of the grid cell being burned. | | | | |
| **Unit** | W/m2 | | | | |
| **Note** |  | | | | |
| **Requirements** | | | | | |
| **Item needed** | **Unit** | **Metric** | **[1]** | **Value** | **Derivation and References and Standards** |
| **Horizontal Resolution** | m | Minimum mapping unit to which the FRP product refers | G | 50 | This resolution is mostly required by fire managers and fire extinction services |
| B | 200 | Useful for fire risk assessment and better understanding of fire risk factors |
| T | 25.000 | Most climate modelers work at coarse resolution grids, 025 d is the most common.  A recent review of users of RS BA products show that most of them work at this level of detail  (<https://www.esa-fire-cci.org/sites/default/files/Fire_cci_D1.1_URD_v5.2.pdf>, updated by Heil 2019). A good published review of users of BA products can be found in Mouillot et al. 2014 and Chuvieco et al. 2019 |
| **Vertical Resolution** | N/A |  | G |  |  |
| B |  |  |
| T |  |  |
| **Temporal Resolution** | Minutes | Minimum temporal period to which the FRP product refers | G | 15 | For fire management purposes, active fire detection should be done very frequently. Atmospheric modelers also require updated information on fire activity |
| B | 120 | Atmospheric modelers |
| T | 1 day | Atmospheric and carbon modelers |
| **Timeliness** | Minutes | Time lapse between satellite overpass and AF availability | G | 10 | Quick information is necessary to use FRP  as an early warning of fire activity |
| B | 60 | Quick information is necessary to use FRP as an early warning of fire activity |
| T | 1 day | Quick information is necessary to use FRP  as an early warning of fire activity |
| **Product Accuracy** | W/m2 | Average deviation between estimated and observed FRP | G | Missing | Missing |
| B | Missing | Missing |
| T | Missing | Missing |
| **Required Measurement Uncertainty** | Accuracy | Standard deviation around the estimated  FRP | G | Missing | Missing |
| B | Missing | Missing |
| T | Missing | Missing |
| **Stability** | Measures of accuracy over the available time period | Assessment of whether a monotonic trend exists based on the slope (b) of the relationship between an accuracy measure (m) and time (t). | Similar to those used for burned area | | |
| **Standards and References** | Chuvieco, E., Lizundia-Loiola, J., Pettinari, M.L., Ramo, R., Padilla, M., Tansey, K., Mouillot, F., Laurent, P., Storm, T., Heil, A., & Plummer, S. (2018). Generation and analysis of a new global burned area product based on MODIS 250 m reflectance bands and thermal anomalies. *Earth Systems Science Data, 10*, 2015-2031.  Chuvieco, E., Mouillot, F., van der Werf, G.R., San Miguel, J., Tanasse, M., Koutsias, N., García, M., Yebra, M., Padilla, M., Gitas, I., Heil, A., Hawbaker, T.J., & Giglio, L. (2019). Historical background and current developments for mapping burned area from satellite Earth observation. *Remote Sensing of Environment, 225*, 45-64.  Heil, A. (2019). ESA CCI ECV Fire Disturbance: D1.1 User requirements document, version 6.0. In. Available from: https://[www.esa-fire-cci.org/documents](http://www.esa-fire-cci.org/documents)  Mouillot, F., Schultz, M.G., Yue, C., Cadule, P., Tansey, K., Ciais, P., & Chuvieco, E. (2014). Ten years of global burned area products from spaceborne remote sensing—A review: Analysis of user needs and recommendations for future developments. *International Journal of Applied Earth Observation and Geoinformation, 26*, 64-79.  Padilla, M., Stehman, S.V., Litago, J., & Chuvieco, E. (2014). Assessing the Temporal Stability of the Accuracy of a Time Series of Burned Area Products. *Remote Sensing, 6*, 2050-2068.  Roteta, E., Bastarrika, A., Storm, T., & Chuvieco, E. (2019). Development of a Sentinel-2 burned area algorithm: generation of a small fire database for northern hemisphere tropical Africa *Remote Sensing of Environment, 222*, 1-17. | | | | |
| **Adaptation and Extremes** | | | | | |
|  | Relevant? (Yes/No) | Sugg. Req. sufficient? (Yes/No) | Explanation | | |
| **Adaptation[2]** | Yes | Yes | Climate changes impact fire regimes, and FRP is one of the components | | |
| **Extremes[3]** | Yes | Yes | Extreme fire events will impact FRP, as the more severe fires will tend to create higher FRP values | | |

[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