# CAMS global sea salt aerosol mixing ratios

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This article clarifies an issue some of our users have experienced with the use of CAMS **global sea salt aerosol mixing ratios**. The current package of the global CAMS C-IFS model (Morcrette et al., 2009), which was developed during the course of the GEMS and MACC projects, mainly follows the aerosol treatment of the LOA/LMD-Z model (Boucher et al. 2002; Reddy et al. 2005). Prognostic aerosols of sea salt are described using three size bins. For sea-salt, radius bin limits are at 0.03, 0.5, 5 and 20 microns. As described in Reddy et al. (2005), sea salt emissions as well as sea salt particle radii are expressed at 80% relative humidity. This is different from all the other aerosol species in C-IFS, which are expressed as dry mixing ratios (0% relative humidity).

The model formulation and the subsequent treatment in C-IFS are correct. All relevant aerosol parametrizations depend on the actual (ambient) values of the relative humidity. In particular, the sea salt aerosol optical depths refer to ambient conditions as for other aerosol species. However, it was until recently never clearly documented as part of the MACC/CAMS C-IFS documentation, other than in the publication by Reddy et al. (2005), that the reported sea salt mixing ratios are for 80% relative humidity. To transform the provided values back to dry matter a reduction factor of 4.3 is needed for the mass mixing ratios and a reduction factor of 1.99 for the radii of the sea salt bin limits.

Based on feedback of CAMS users, we now intend to reformulate the definition of sea salt aerosol in C-IFS in one of the upcoming model upgrades. This page will be updated accordingly. In the meantime, users can use the above conversion factors to obtain dry sea salt mixing ratios, if they wish to do so. All current CAMS global products, including the upcoming CAMS Reanalysis, will still use the current formulation until further notice.

### References:


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- Reddy, M. S., O. Boucher, N. Bellouin, M. Schulz, Y. Balkanski, J.-L. Dufresne and M. Pham, 2005: Estimates of global multi-component aerosol optical depth and direct radiative perturbation in the Laboratoire de Météorologie Dynamique general circulation model, J. Geophys. Res., **110**, D10S16, https://doi.org/10.1029/2004JD004757.




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