# Achievements of the ESA Aerosol_cci project

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The Aerosol_cci project within the ESA Climate Change Initiative (CCI) has finished. In this paper we summarize its main achievements and discuss the future needs for algorithm development (i. a. in the ESA CCI+ program). We also highlight the perspectives for routine dataset processing within the Copernicus Climate Change Service (C3S).

The main outcome of Aerosol_cci is as follows:
- substantial improvement of dataset quality
- consistent long-term records over 1-3 decades
- complementary parameters (Dust AOD, Fine Mode AOD, Total AOD, Absorbing AOD, stratospheric extinction) from different sensors AATSR, IASI, POLDER, MERIS, GOMOS
- demonstration of the information content for layer height (IASI), diurnal cycles (SEVIRI)
- establishment of a concept for pixel-level uncertainties
- establishment of AEROSAT as international forum
- integration and visibility of the European aerosol retrieval community
- evaluation of the usefulness of the datasets in 8 user case studies
- transfer of the routine tasks to C3S
- qualitative understanding of the reasons for differences between datasets processed with different algorithms (cloud masking, quality filtering – trade-off between accuracy and coverage)
- derivation of robust trends from different algorithms (with remaining biases)

Future algorithm work is needed for record extension (i. a. with Sentinel sensors), consolidation (e. g. propagation to gridded product uncertainties) and consistent integration of the various complementary datasets (e. g. ensembles, integrated products).