**Aerosol model development for the future-generation E3SM at convection-permitting scales**

**Team**

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**Abstract**

Atmospheric aerosol particles play an important role in the climate system, but the representation of aerosol processes in Earth system models (ESMs) still needs to be improved, particularly when ESMs approach high resolutions. Originally developed for traditional coarse-resolution ESMs, the Modal Aerosol Module (MAM) adopted in E3SM provides a complete but rather simplified treatment of the aerosol processes. Under the *Enabling Aerosol-cloud interactions at GLobal convection-permitting scalES* (EAGLES) project, we are addressing some new challenges for running E3SM at global high-resolution (~3km) and for a more accurate representation of aerosol size distribution (e.g. ultrafine and coarse particles) and composition (e.g. natural aerosols such as biomass burning smokes) that are crucial for realistic estimate of anthropogenetic aerosol effects at cloud-permitting scales. This poster provides an overview of the current aerosol model development activities under EAGLES and our next steps for model integration and evaluation.