

Aerosol Physics and Chemistry Validation NUIG

Networks of continuous Observing Stations:

EMEP - European

IMPROVE - US

GAW - Global

Generally, good coverage with PM mass for inorganic species,

Poor coverage for chemical mass

Poorer coverage for size-resolved chemical mass

Some stations (i.e. Mace Head) have semi-continuous size resolved measurements in recent years (ie 2003 on).

Model first simulation

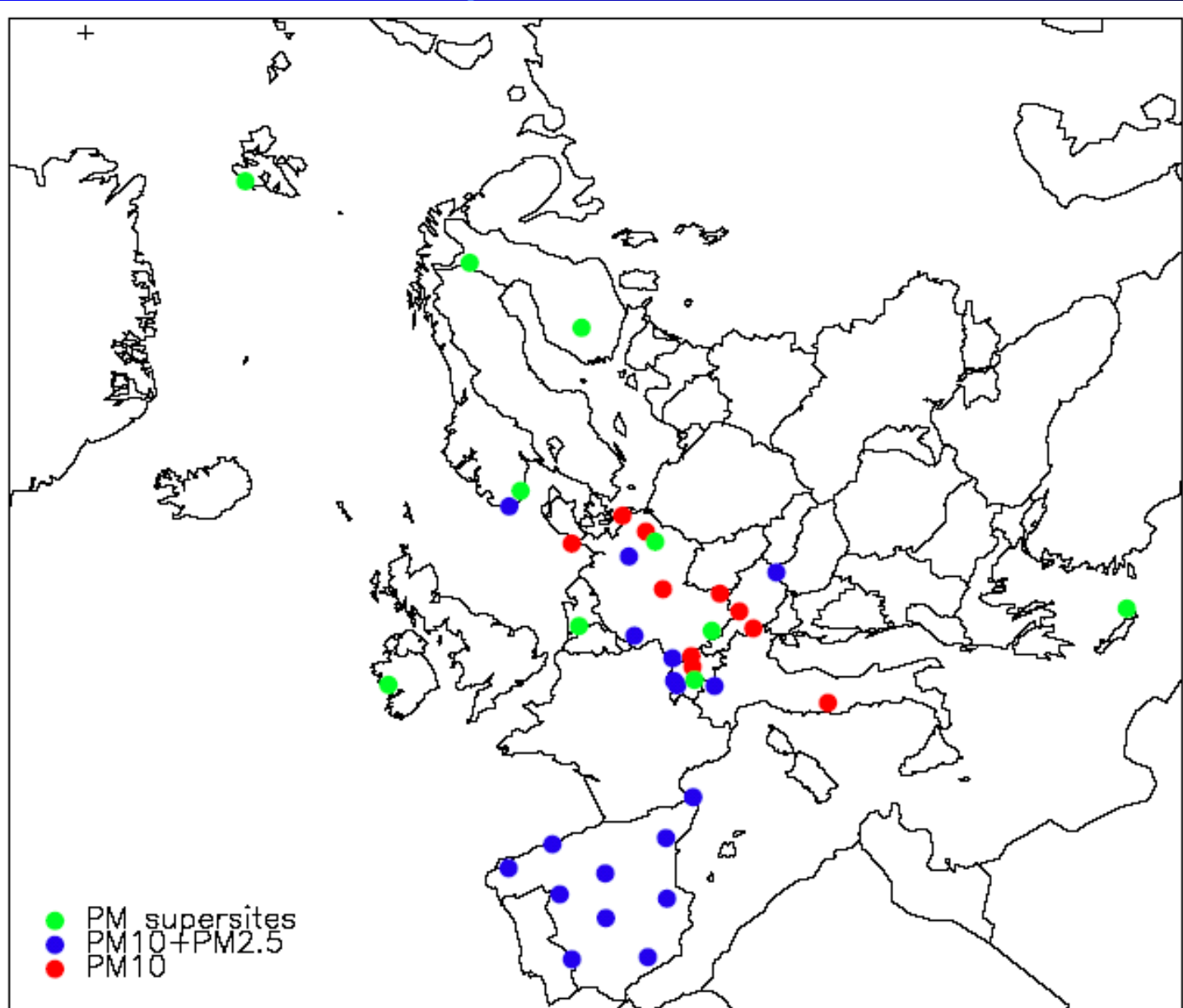
Desert dust and Sea-salt – 3 size bins.

1 December 2002 to 30 June 2003

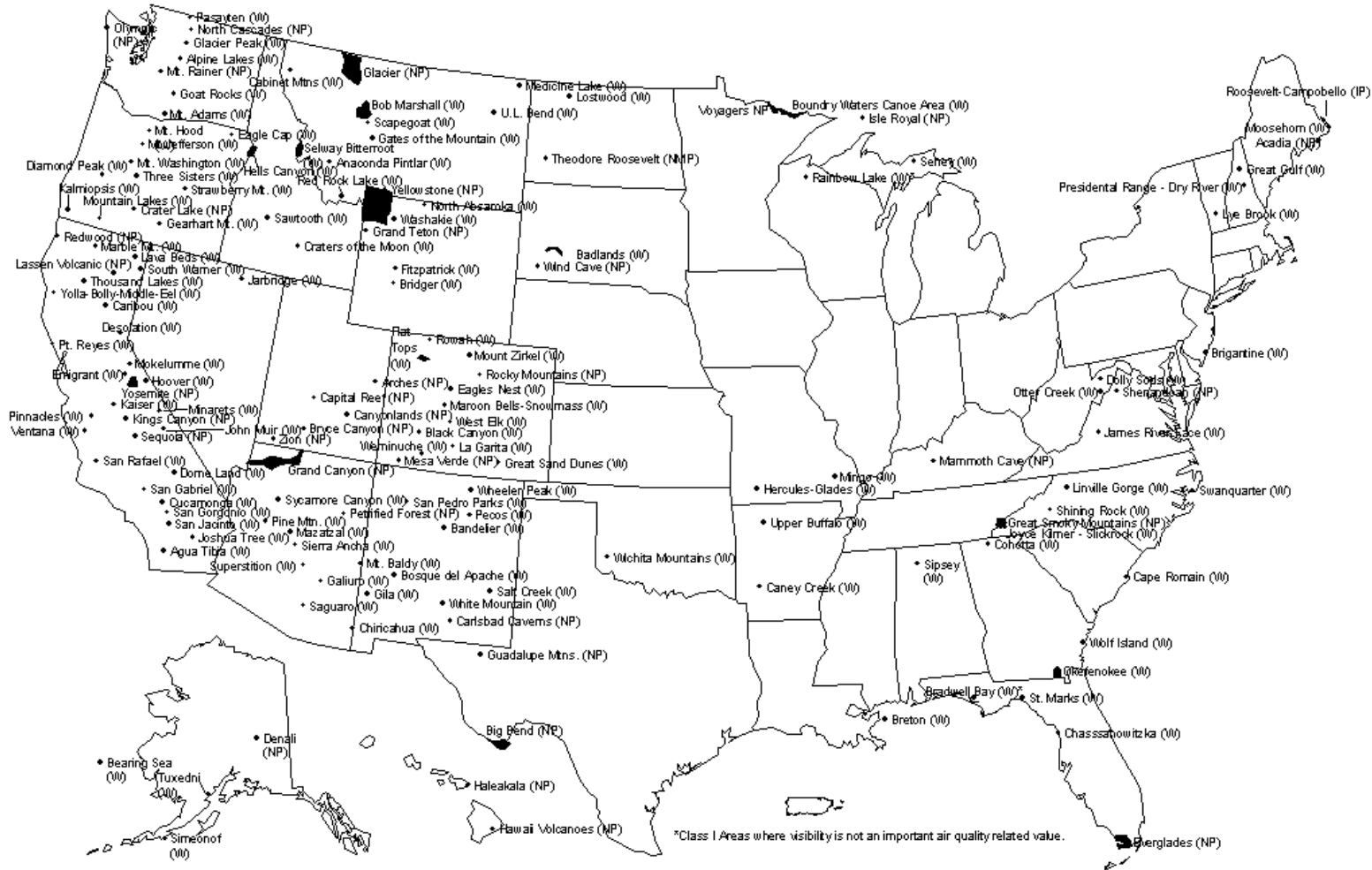
Series of 12-hour forecasts starting every 12 hours from the ECMWF operational analyses.

Suggested initial validation period – January to June 2003

EMEP

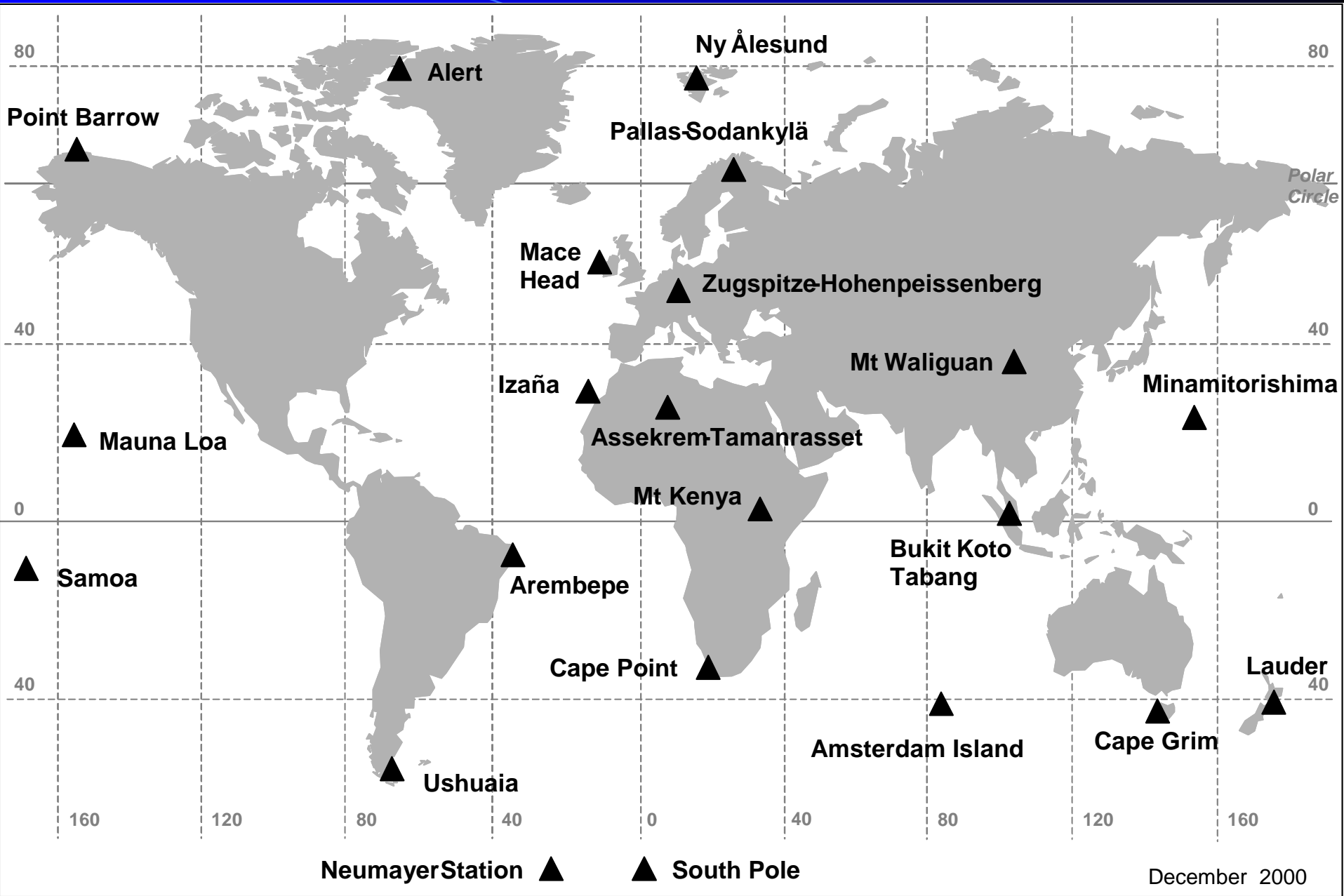


IMPROVE

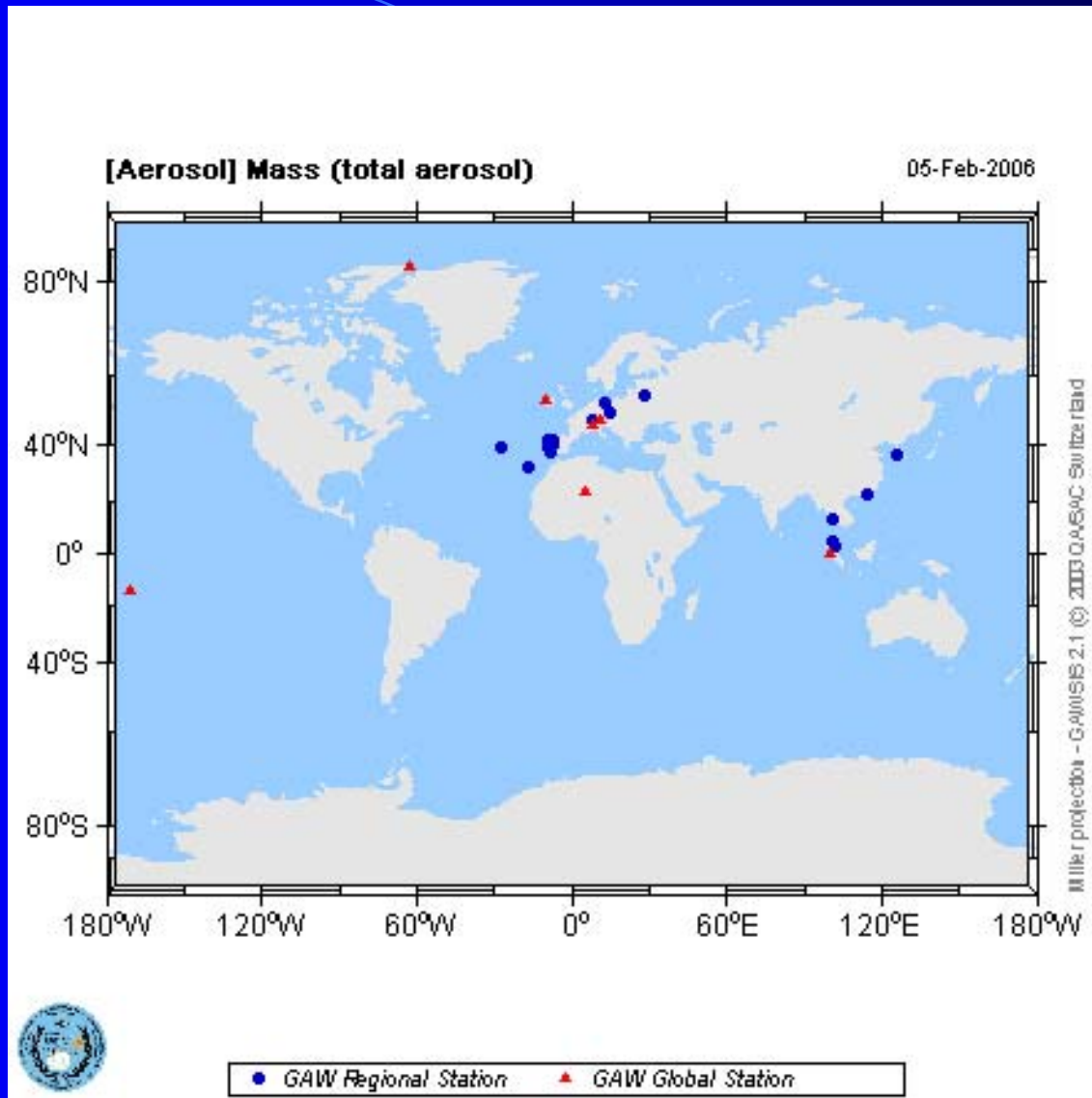


Map of 156 National Park and Wilderness Areas Protected by EPA's Regional Haze Rule

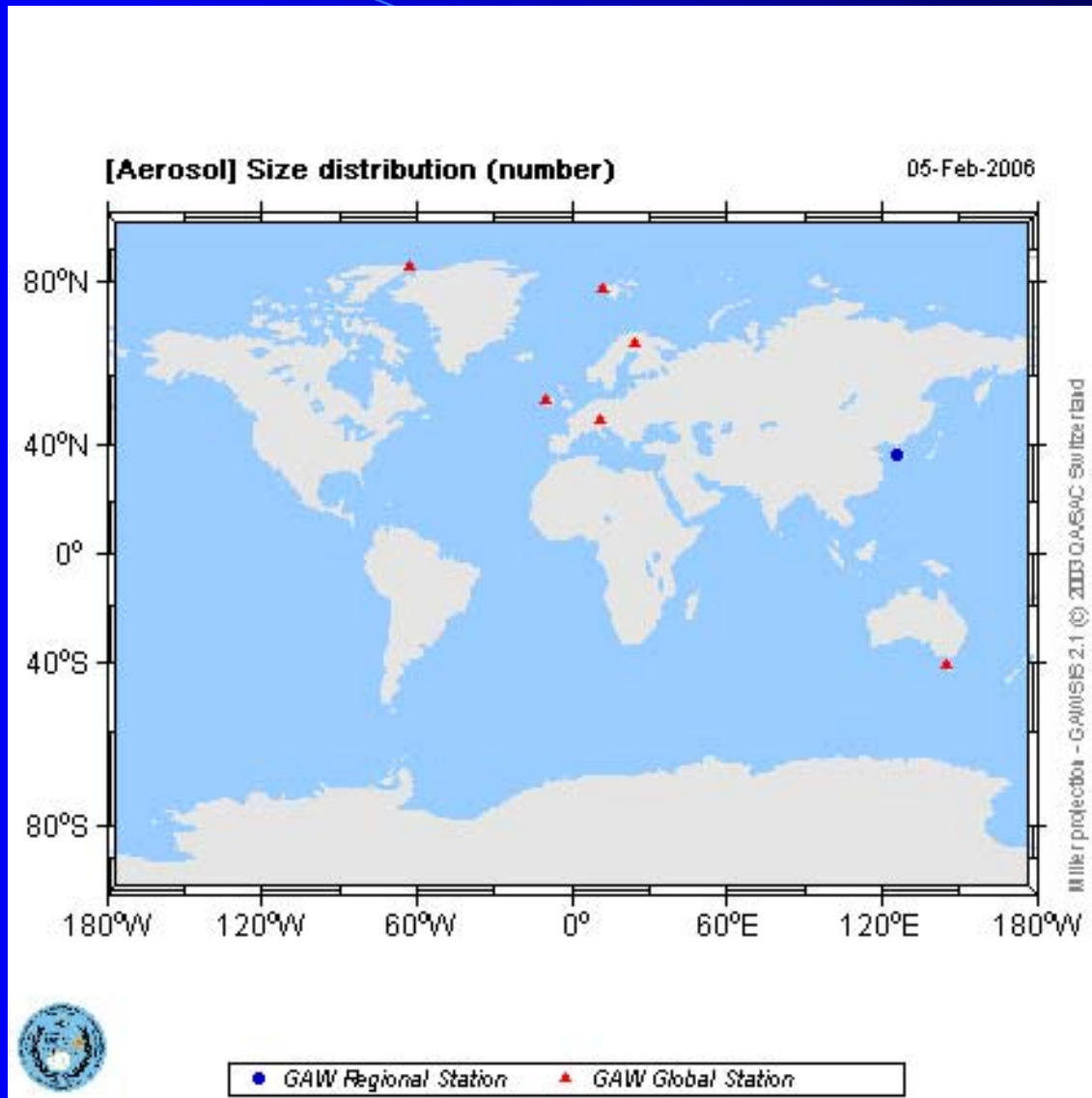
GAW



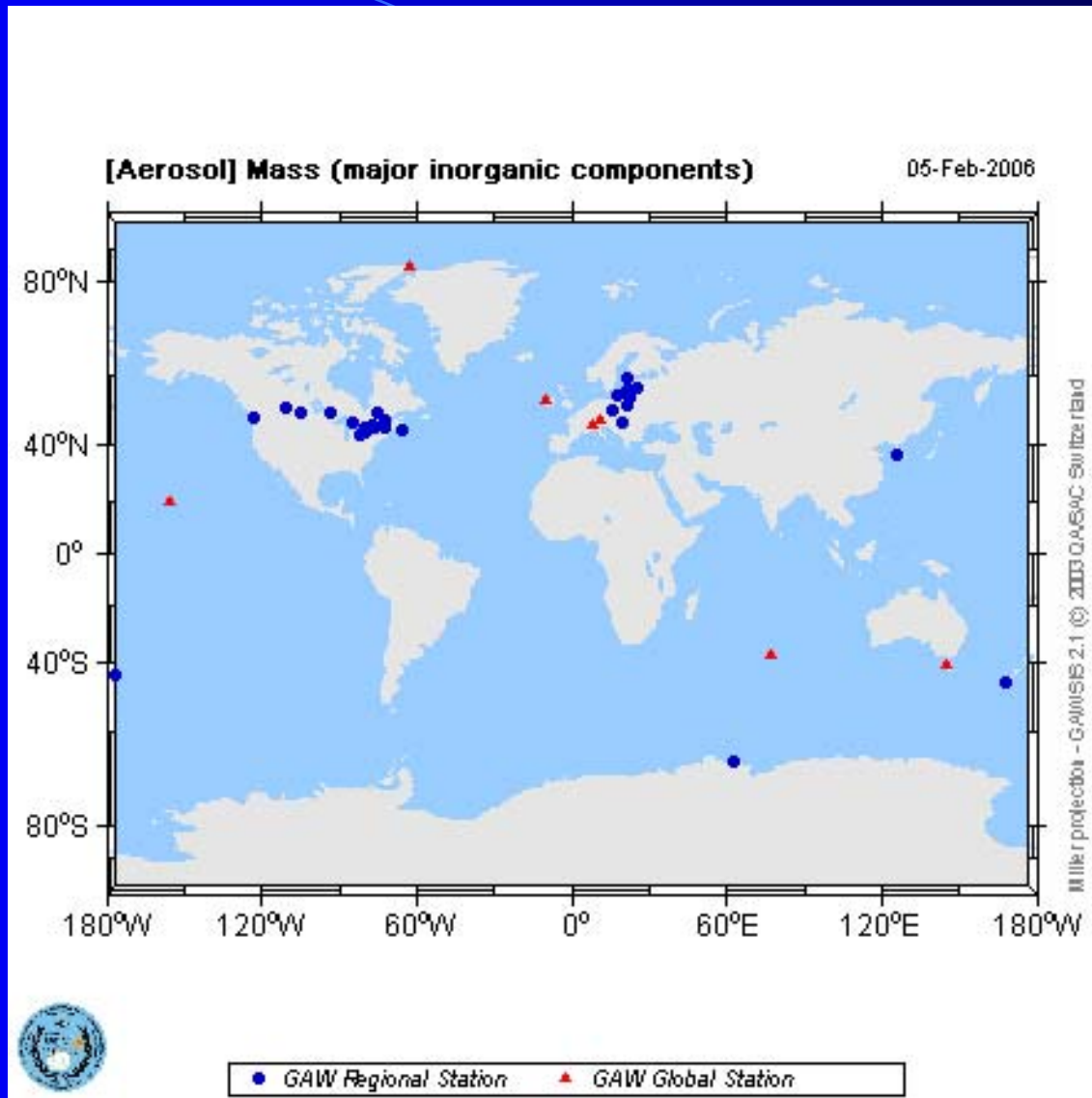
GAW



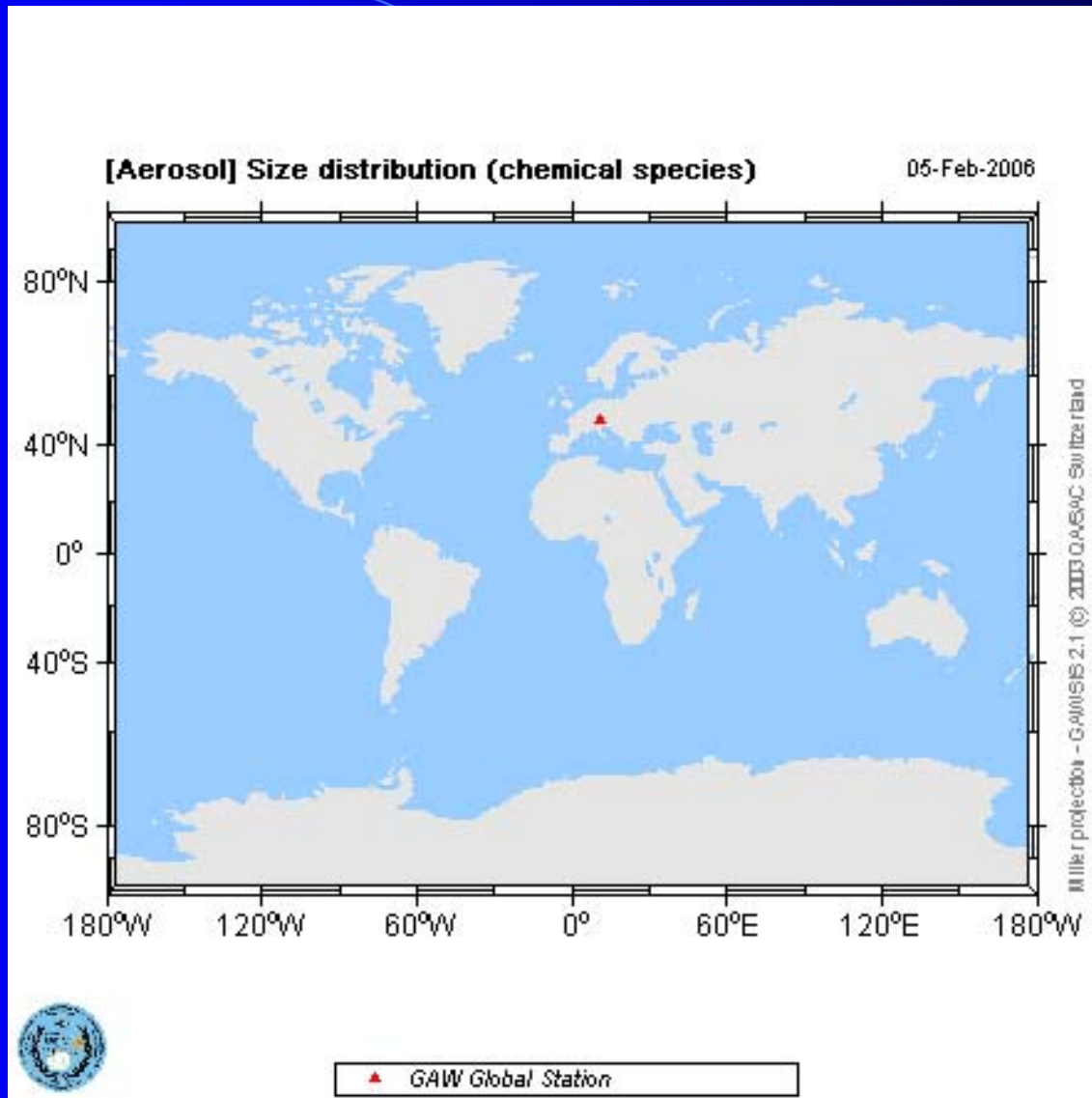
GAW



GAW



GAW



Efforts to Date

Collation of databases:

All available EMEP, GAW and IMPROVE data downloaded to NUIG.

Analysis for particular data/parameter coverage (on-going)

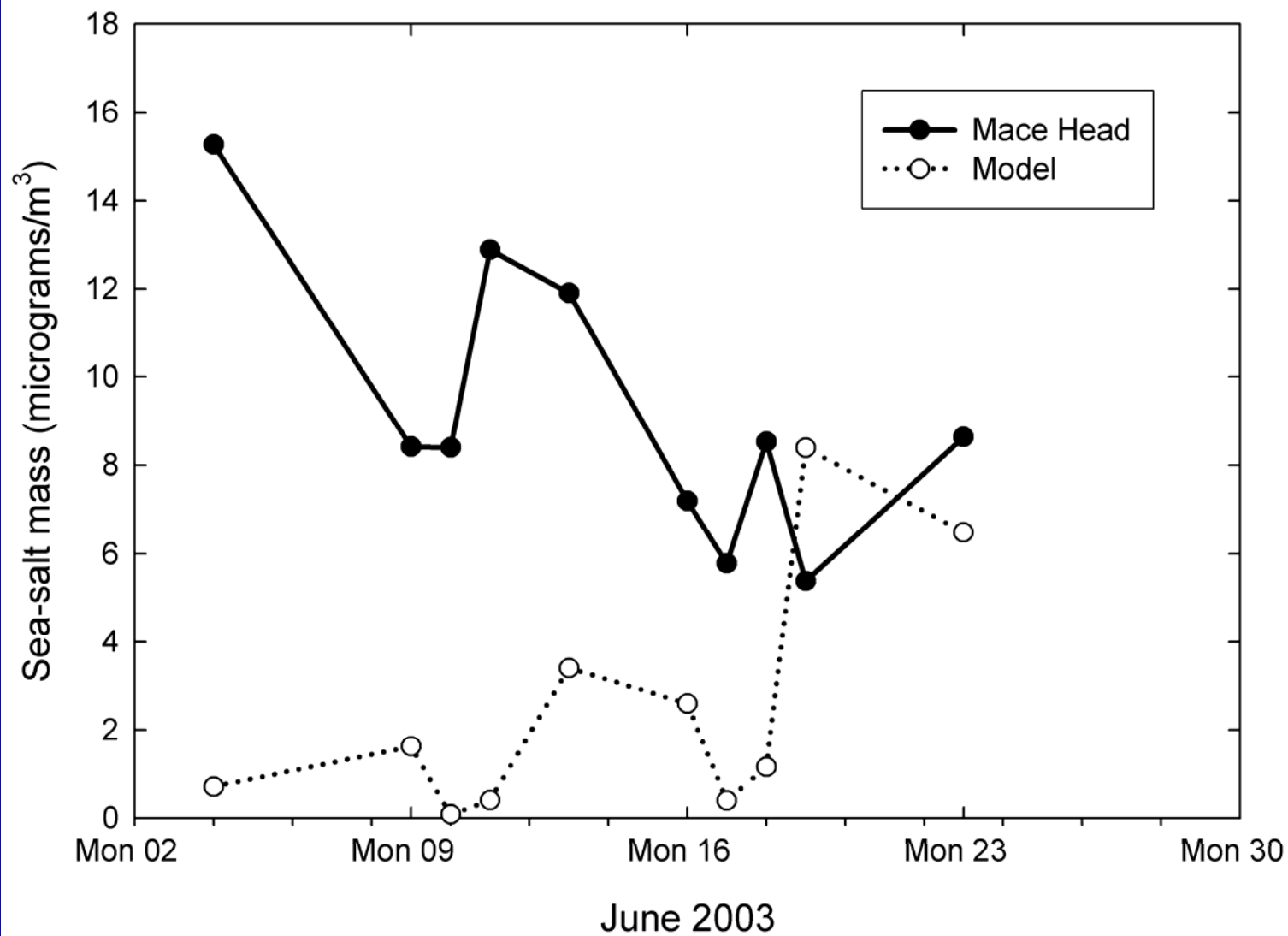
Registration on GEMS-MARS system

Development of MARS decoder and extraction software for extracting model aerosol fields for comparison with databases.

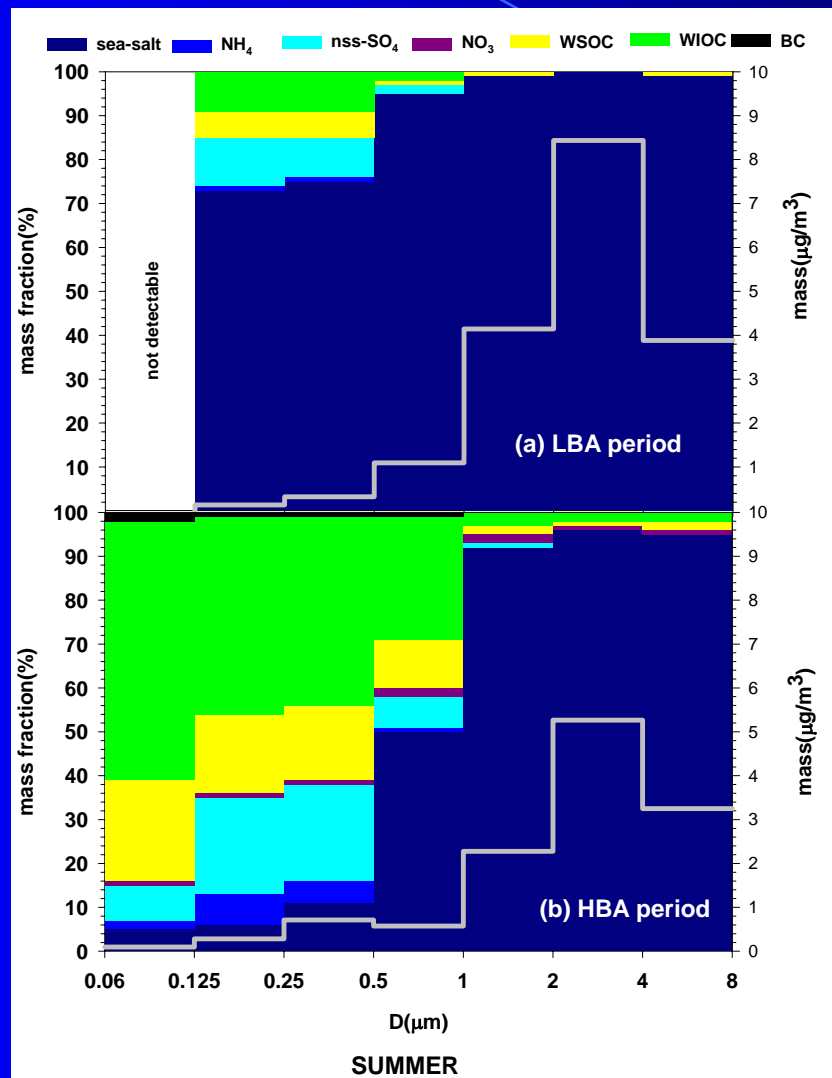
Identification of 'clean-air' periods over NE Atlantic (Mace Head) for comparison of model sea-salt distributions:

- (1) Near daily 24-hour PM10 sea-salt**
- (2) Weekly samples of size segregated sea-salt fields**

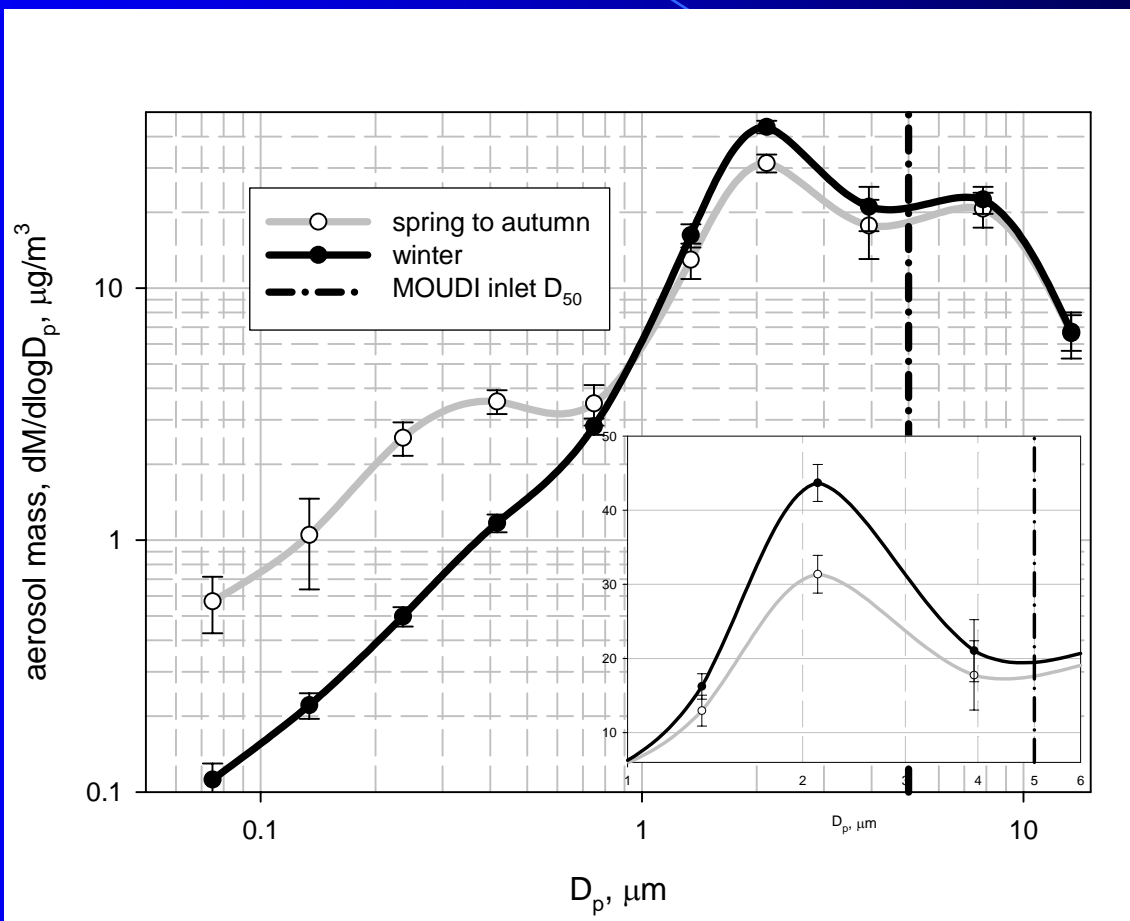
Initial Sea-Salt Mass Comparison – N. Atlantic



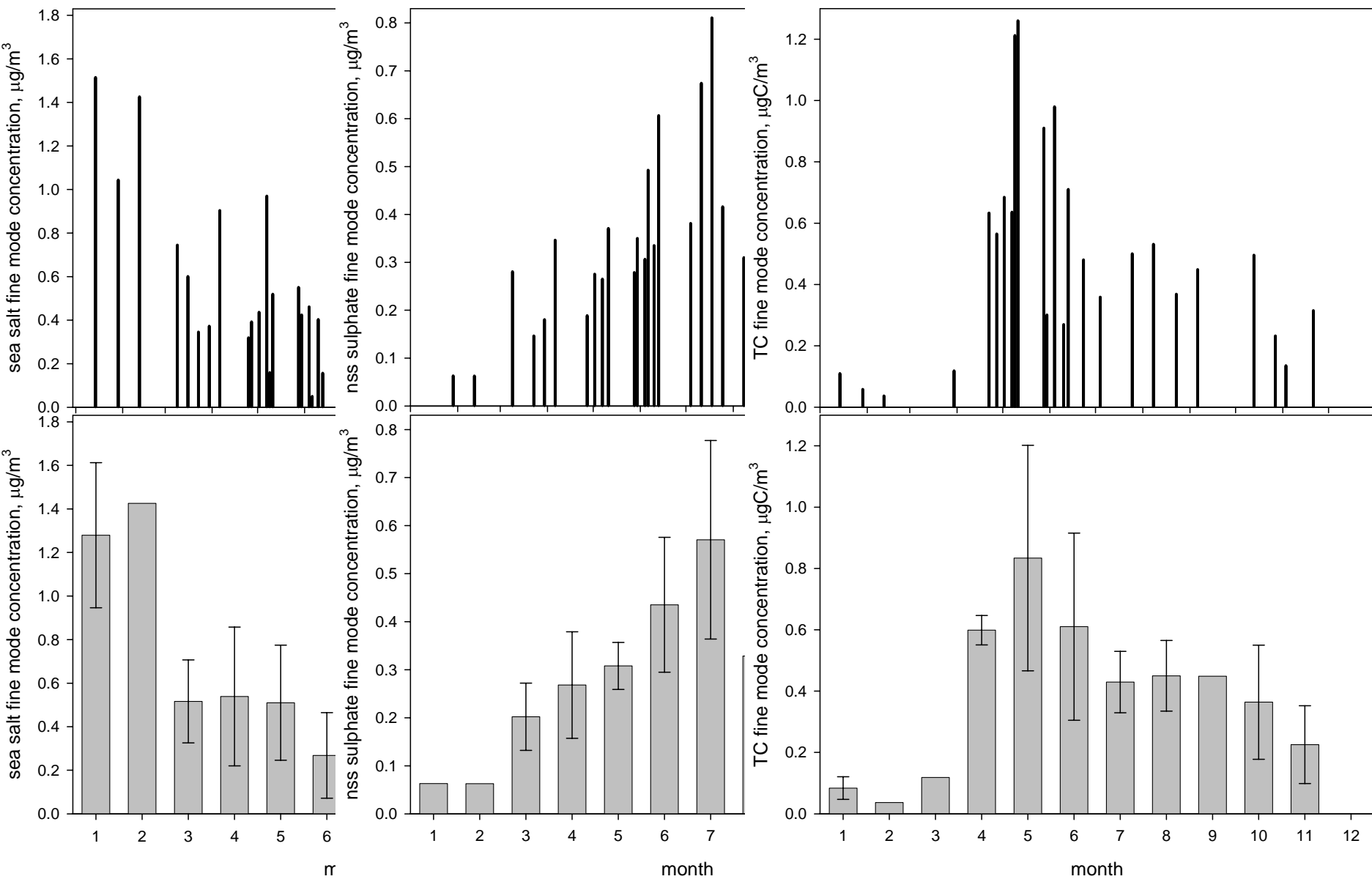
Sea Spray Chemistry over the North East Atlantic



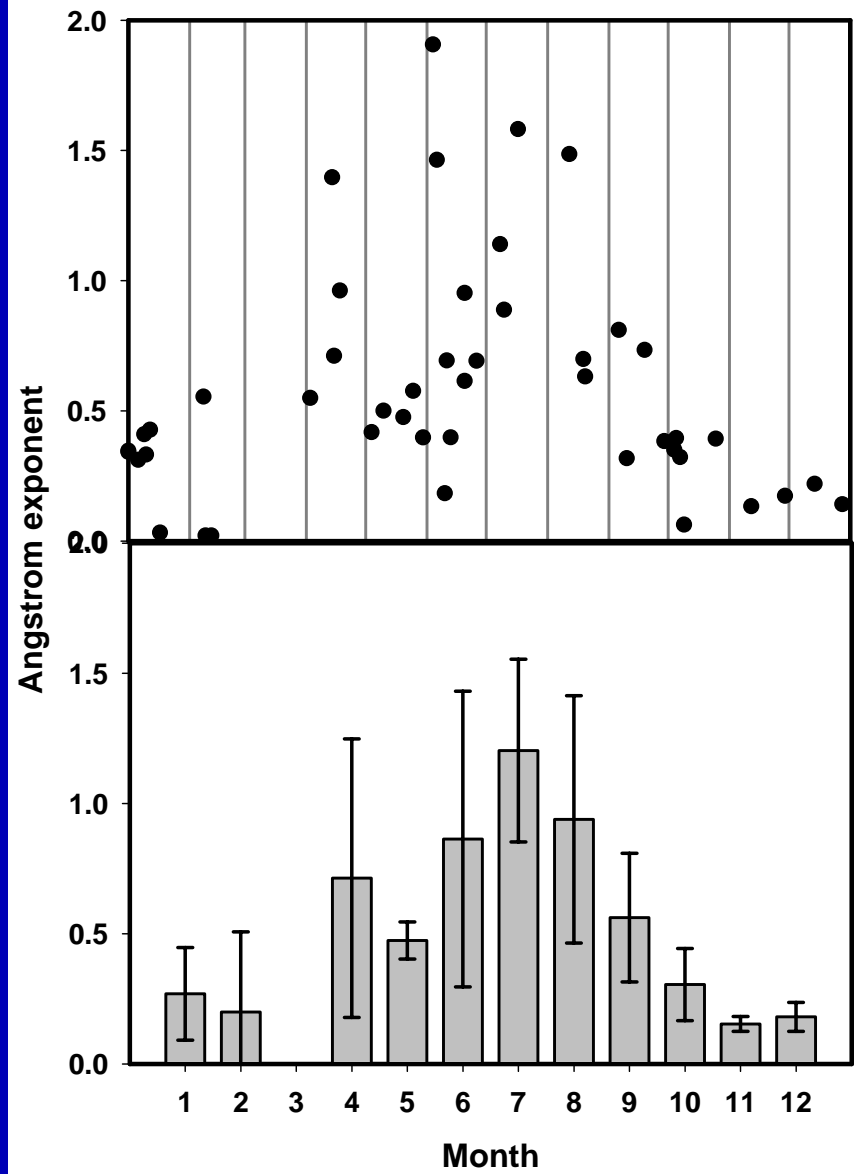
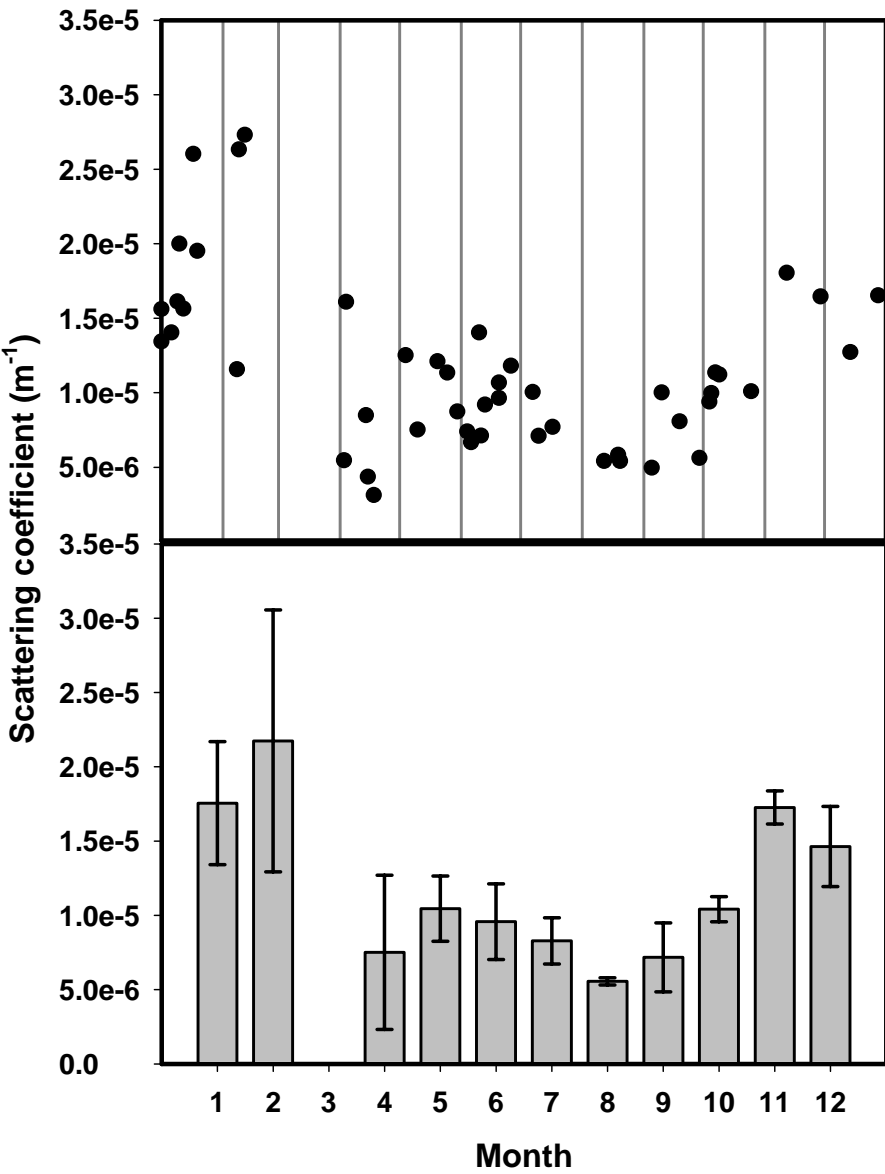
Seasonality in aerosol mass over the North East Atlantic



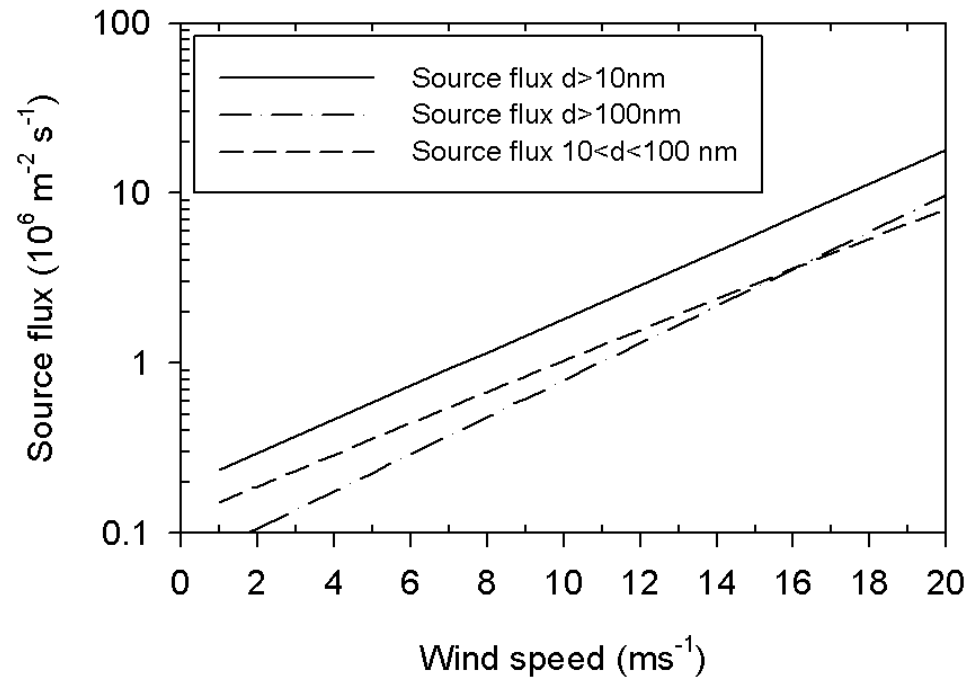
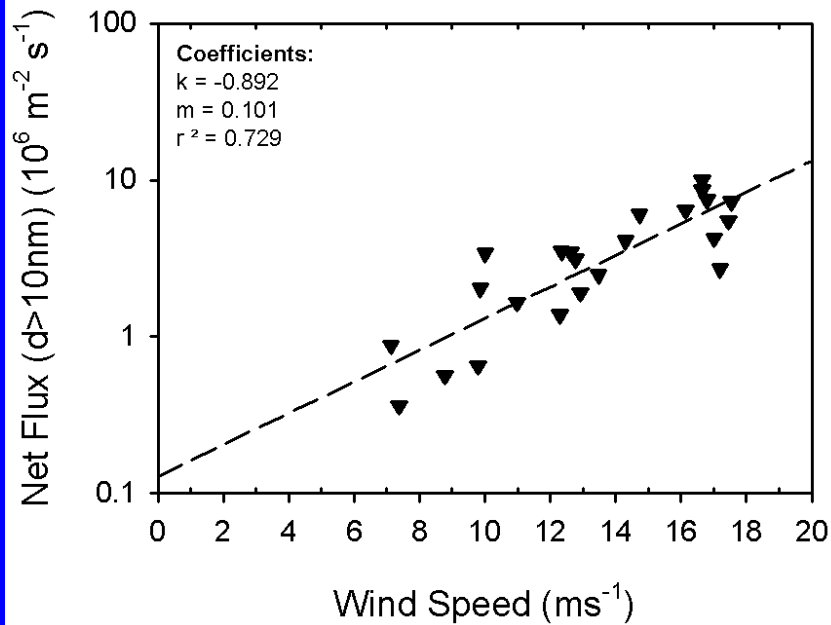
Sea Spray Chemistry over the North East Atlantic



Aerosol Scattering over the North East Atlantic



In-Situ Sea Spray Fluxes over the North East Atlantic



Sea Spray Chemistry over the North East Atlantic



<http://www.empa.ch/gaw/gawsis/default.asp>

and selecting by parameter
[Aerosol] Mass (major inorganic components)

The Contributing stations are

Gaw Global Stations

Amsterdamm Island

Cape Grim

Mace Head

Mauna Loa

Alert

Jungfrauoch

Then there seems to be a few GAW Regional Stations such as

such as UTO, SNIEZKA, K-PUSTA, Anmyeon-do, Saturna Island, Kejimkujik Iba
Experimental Lakes area, Esther and Algoma