Meteorological Service of Canada
Environment Canada

First AEROCOM Worksop
June 2-3, Paris

Global Sea-salt Production Fluxes

Sunling Gong

Formulations

Monahan [1986]

$$\frac{dF_0}{dr} = 1.373 u_{10}^{3.41} r^{-3} \left(1 + 0.057 r^{1.05}\right) \times 10^{1.19 e^{-B^2}}$$

B=(0.380-*log* r)/0.650

Smith [1993]

$$\frac{dF}{dr} = \sum_{i=1,2} A_i \exp\left[- f_i \left(\ln\left(\frac{r}{r_{0i}} \right) \right)^2 \right]$$

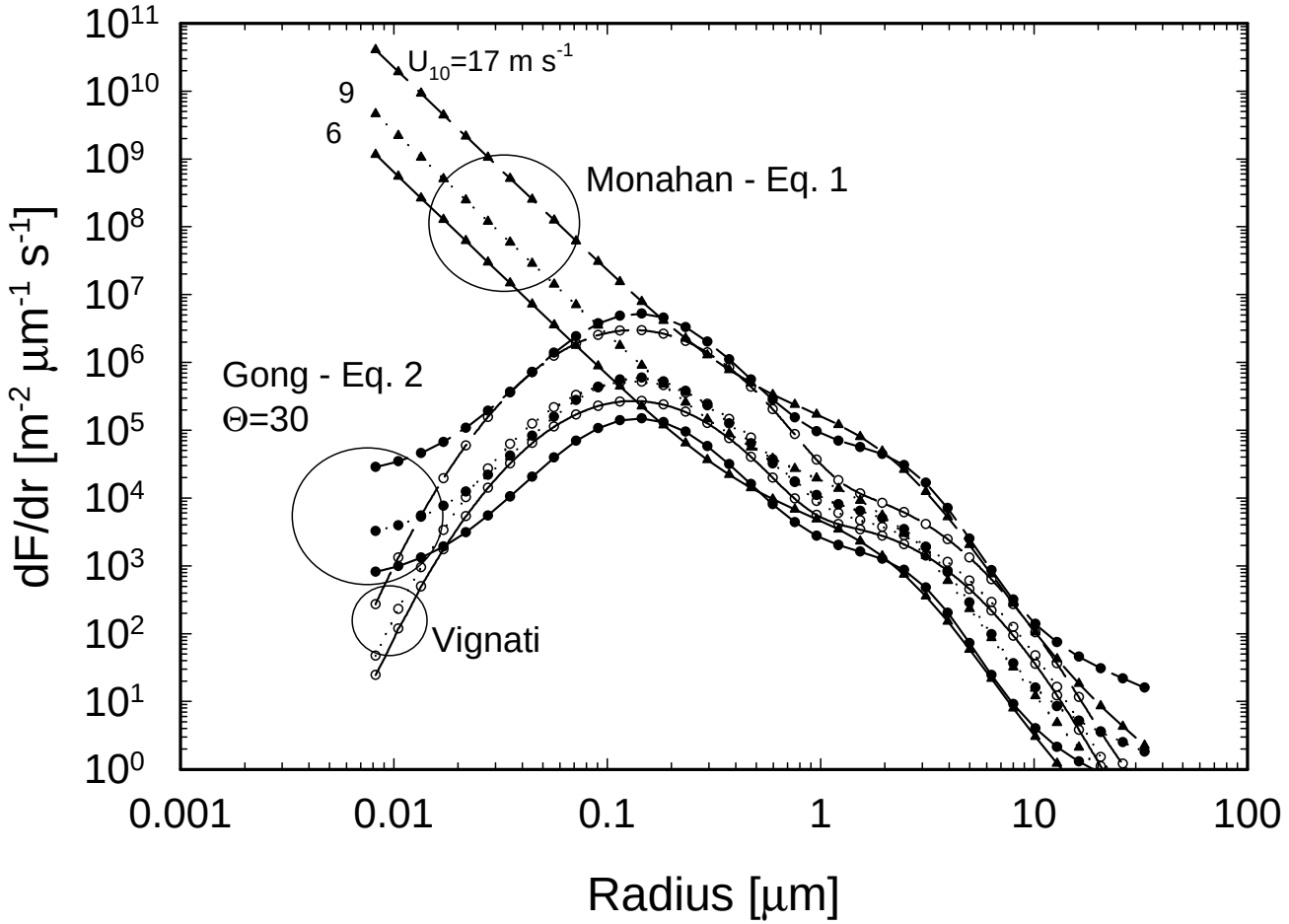
Gong-Monahan [2003]

$$\frac{dF}{dr} = 1.373 u_{10}^{3.41} r^{-A} \left(1 + 0.057 r^{3.45}\right) \times 10^{1.607 e^{-B^2}}$$

$$A = 4.7(1 + \Theta r)^{-0.017 r^{-1.44}}$$

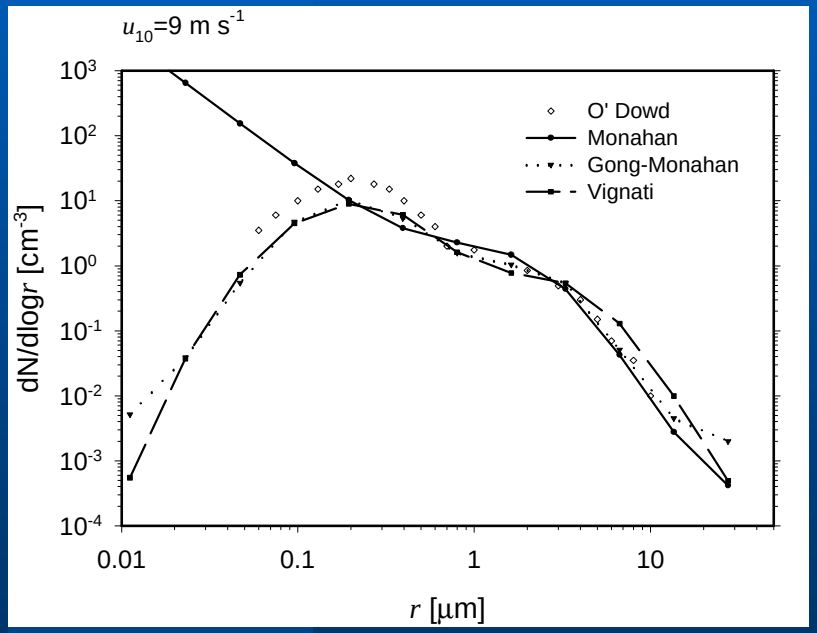
B=(0.433-*log* r)/0.433

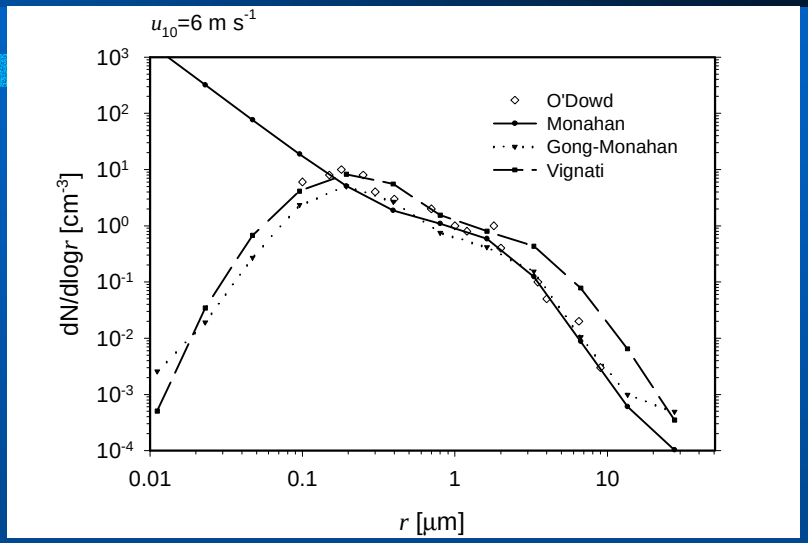
Number Density

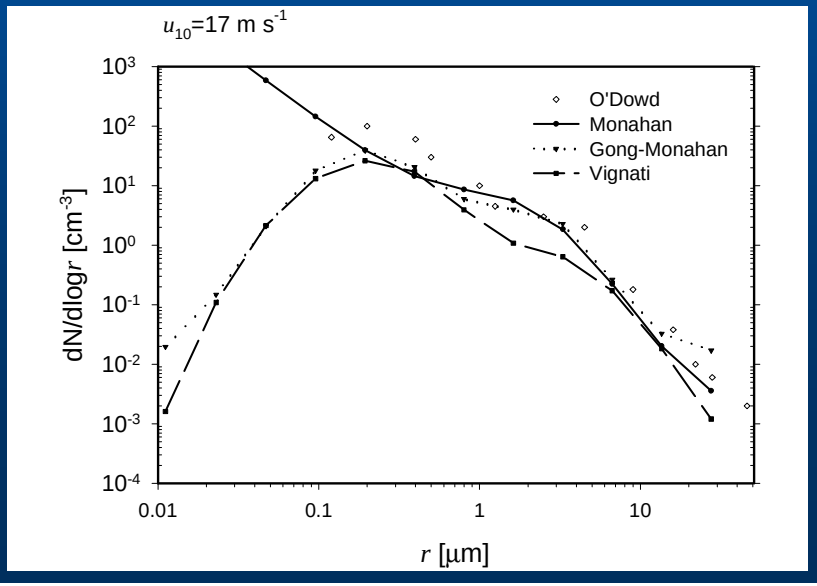


Meteorological Service of Canada
Environment Canada

Number Concentrations vs Observation

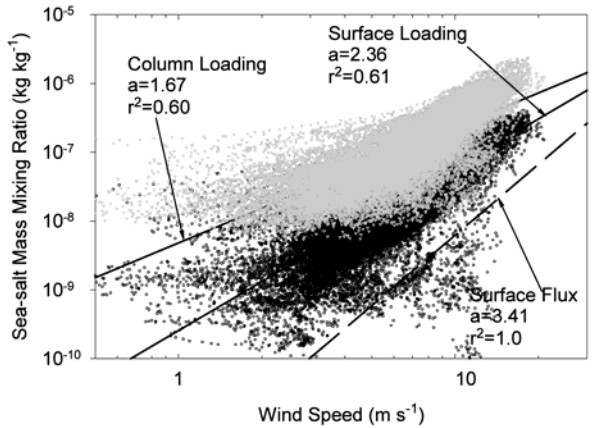




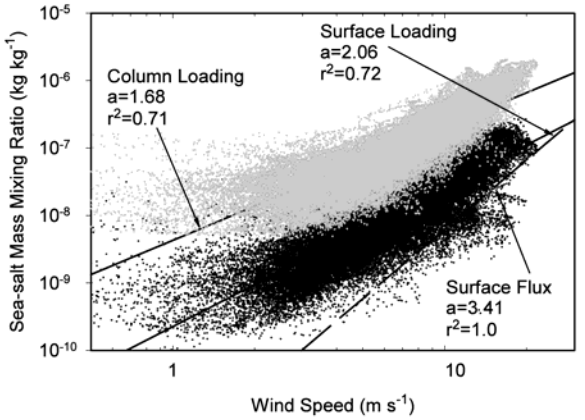


Wind-dependence of Sea-salt – Gong/Monahan

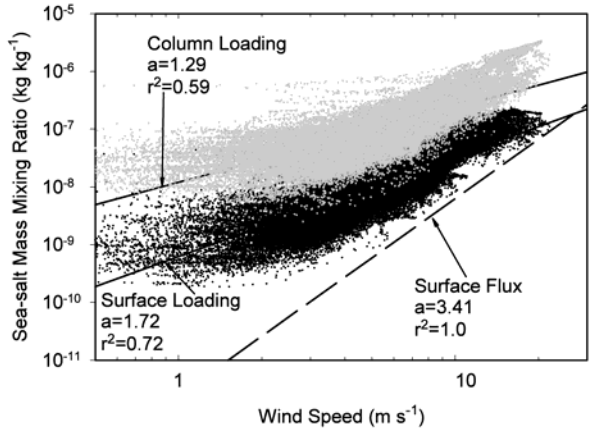
(a) North Atlantic



(b) Roaring 40s South



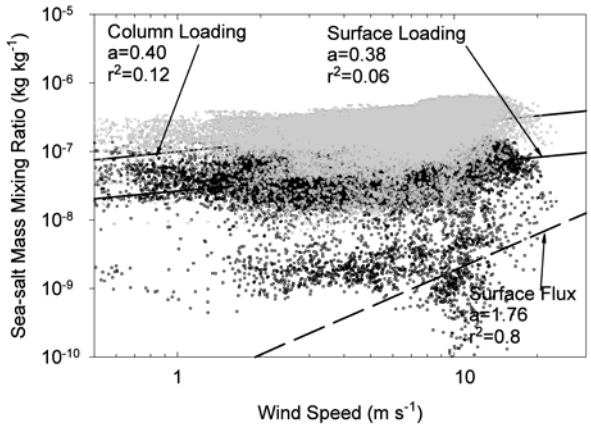
(c) Tropical Pacific



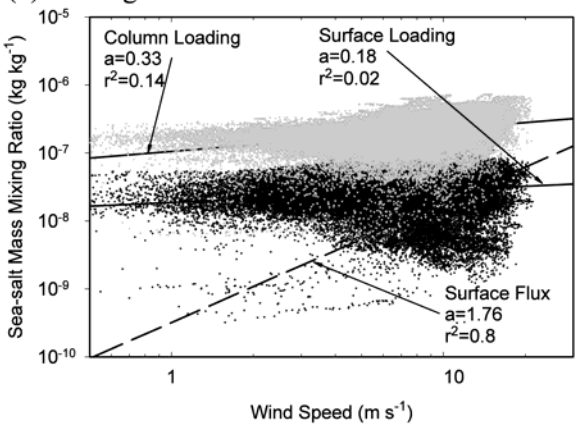
Meteorological Service of Canada
Environment Canada

Wind-dependence of Sea-salt - Smith

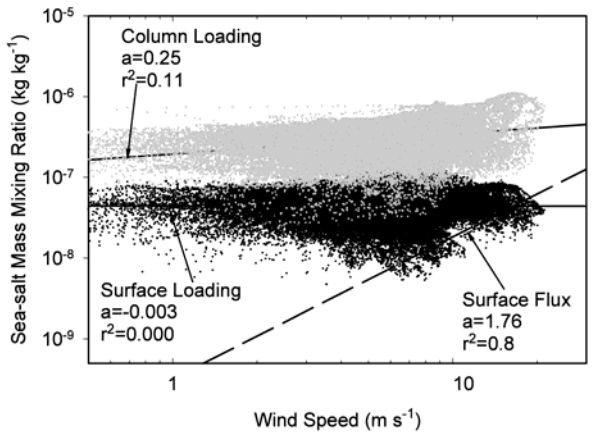
(a) North Atlantic



(b) Roaring 40s South

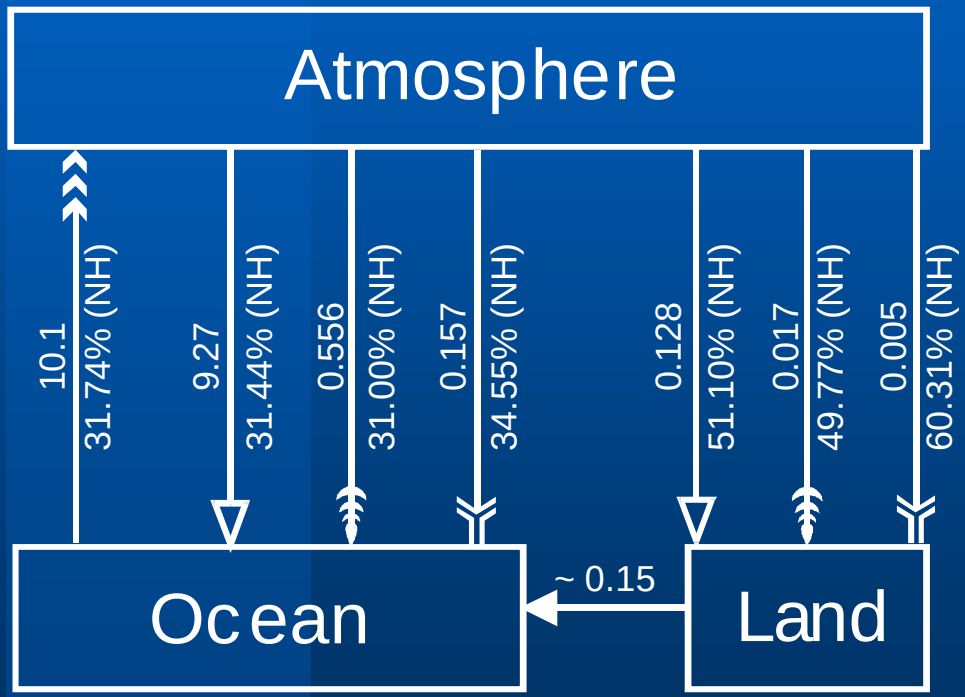


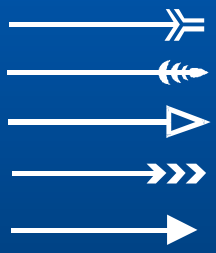
(c) Tropical Pacific



Meteorological Service of Canada
Environment Canada

Global Sea-salt Budgets





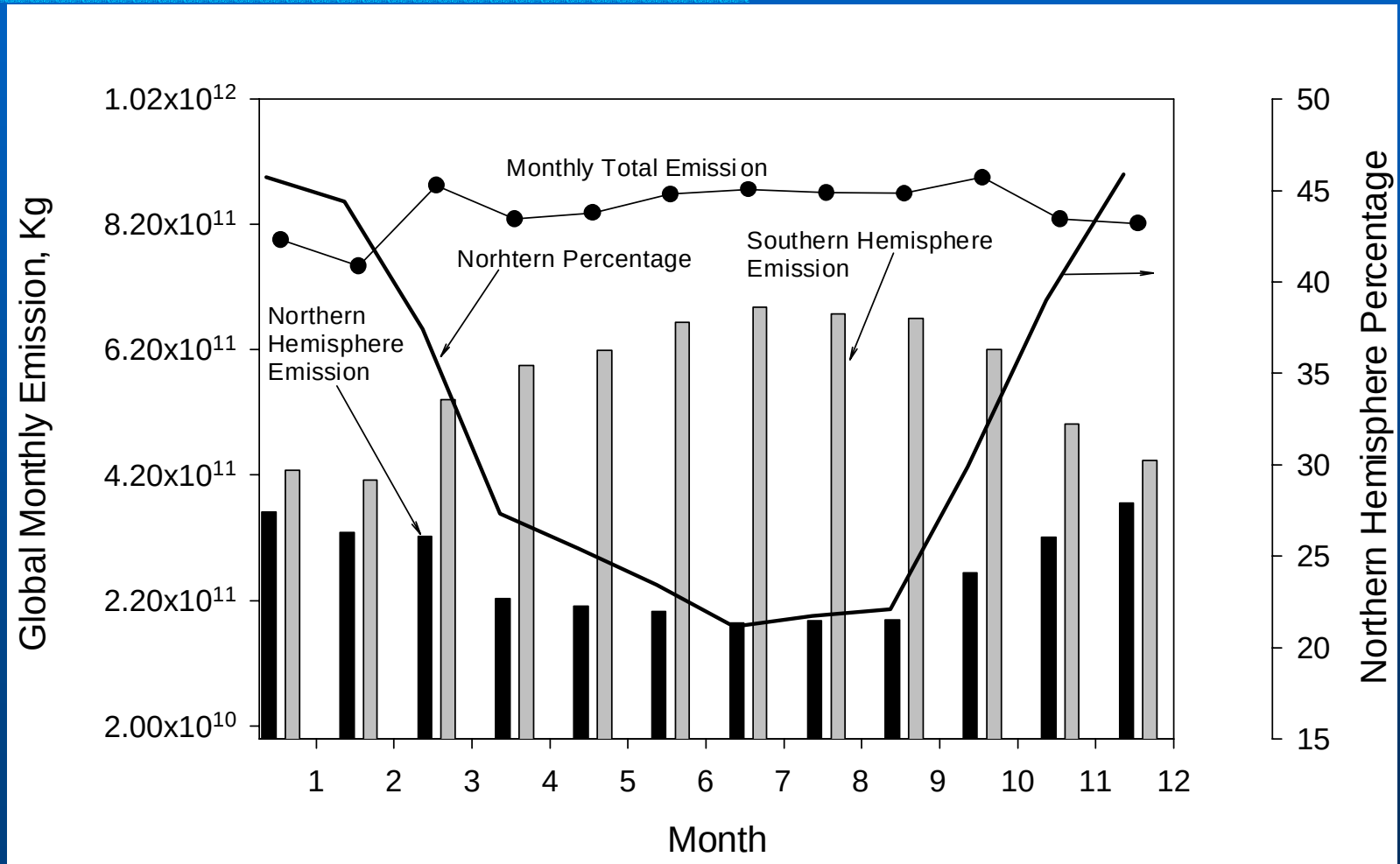
In-cloud
Below-cloud
Dry Deposition
Surface Emission
Land Run-off

$\times 10^{12}$ kg

Meteorological Service of Canada
Environment Canada

Seasonal Variations of Sea-salt Fluxes

(Gong et al 2003)



AEROCOM Sea-salt

Size Segregation

80% RH

- 0.1 – 1 μm
- 1 – 10 μm
- 10 – 40 μm