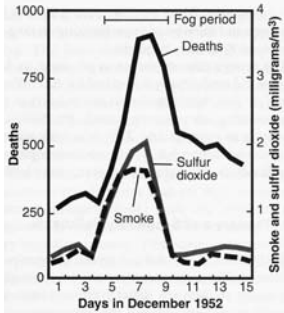


Sulfur Chemistry

Air quality (health effects of particulate matter)

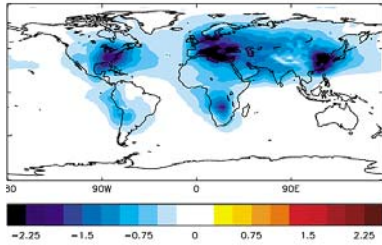


London Smog 1952

Ecosystems: Acid Rain



Climate



Visibility



Major Reservoirs and Burdens of Sulfur (TgS)

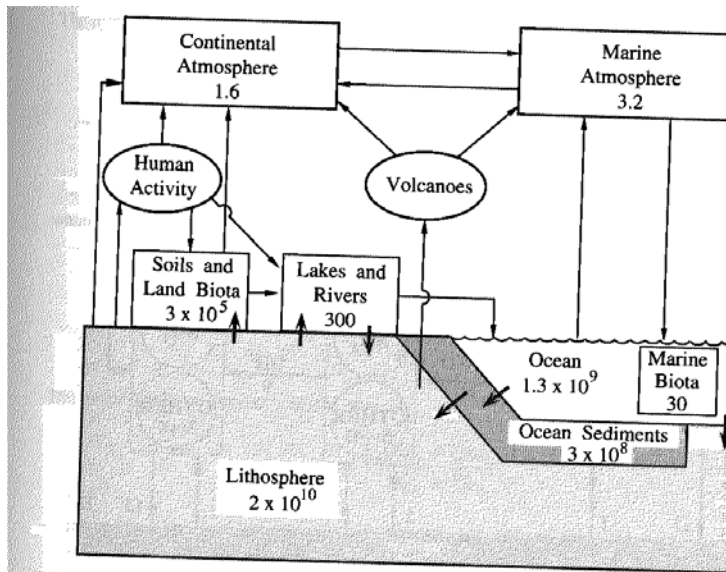


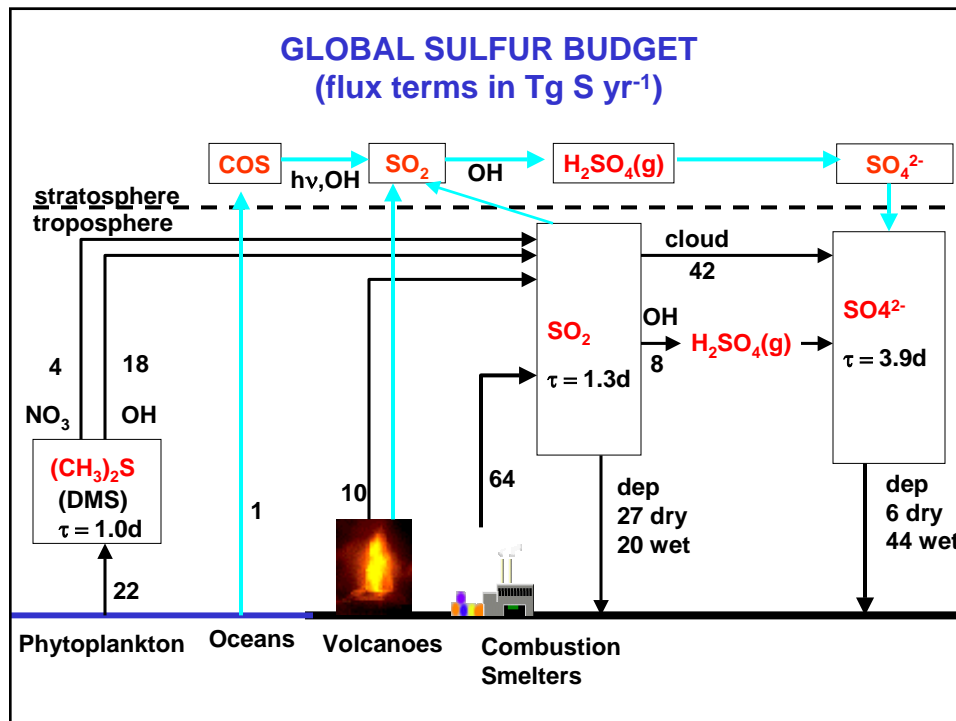
FIGURE 2.2 Major reservoirs and burdens of sulfur, in Tg(S) (Charlson et al., 1992). Reprinted by permission of Academic Press.

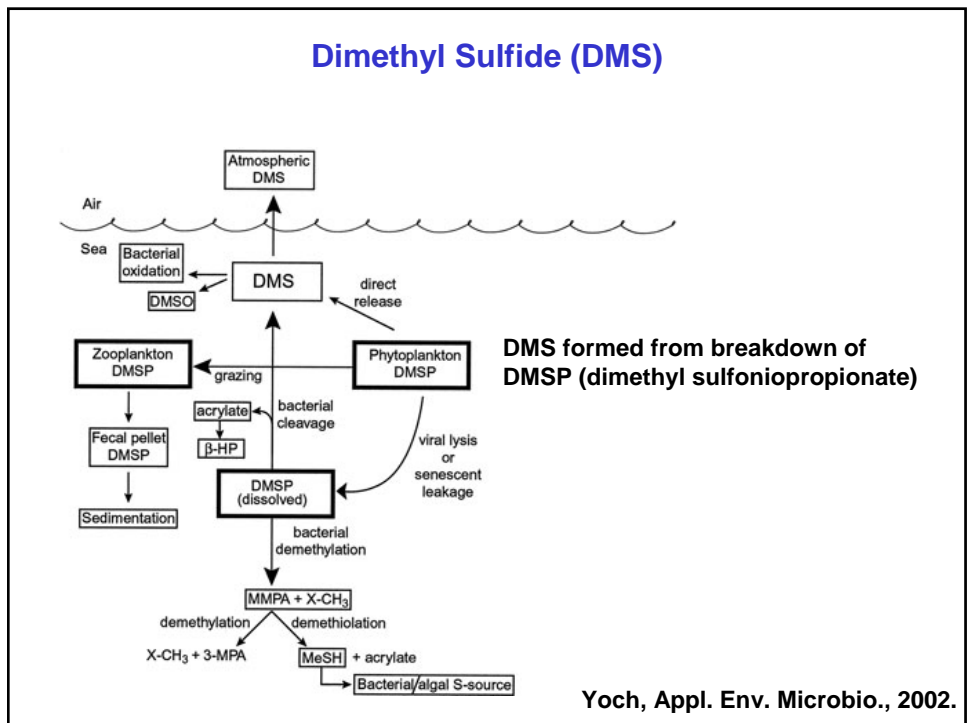
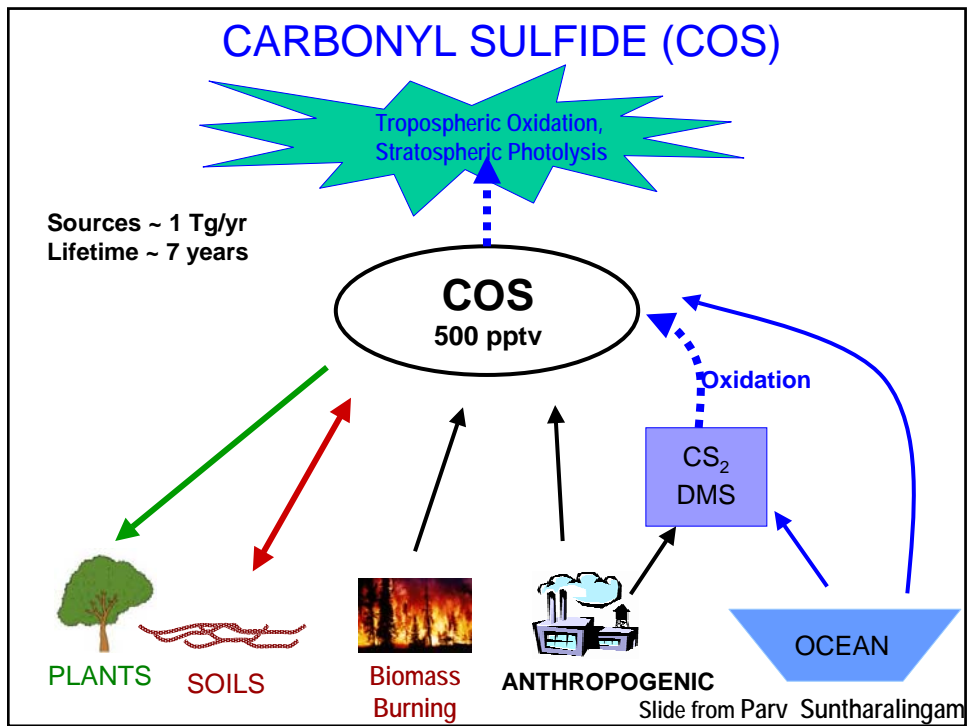
Global Sulfur Emission Estimates (TgS /yr)

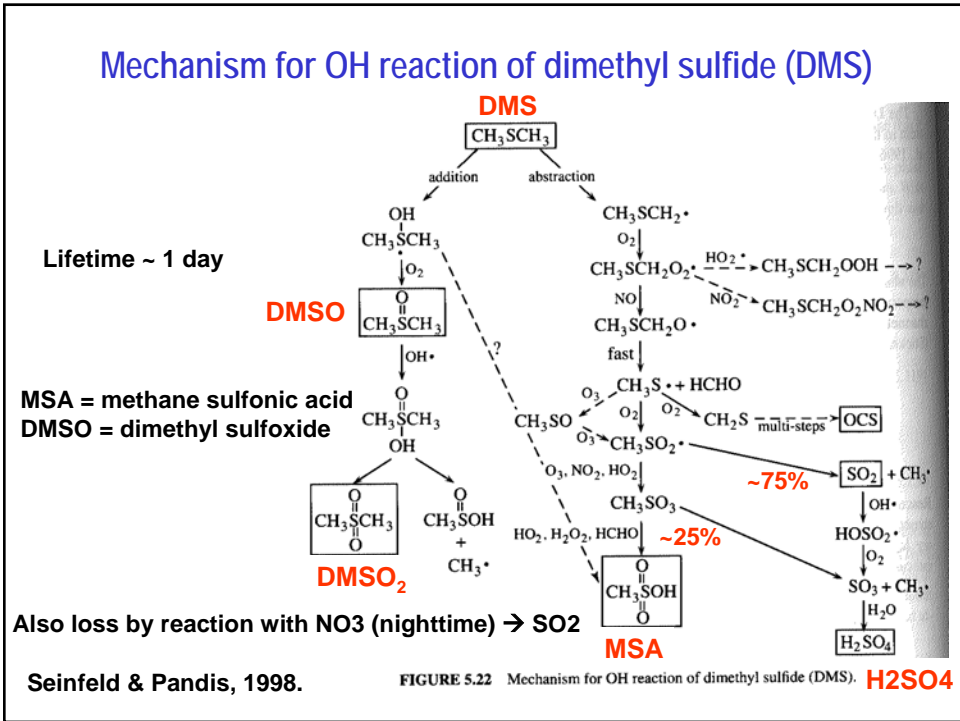
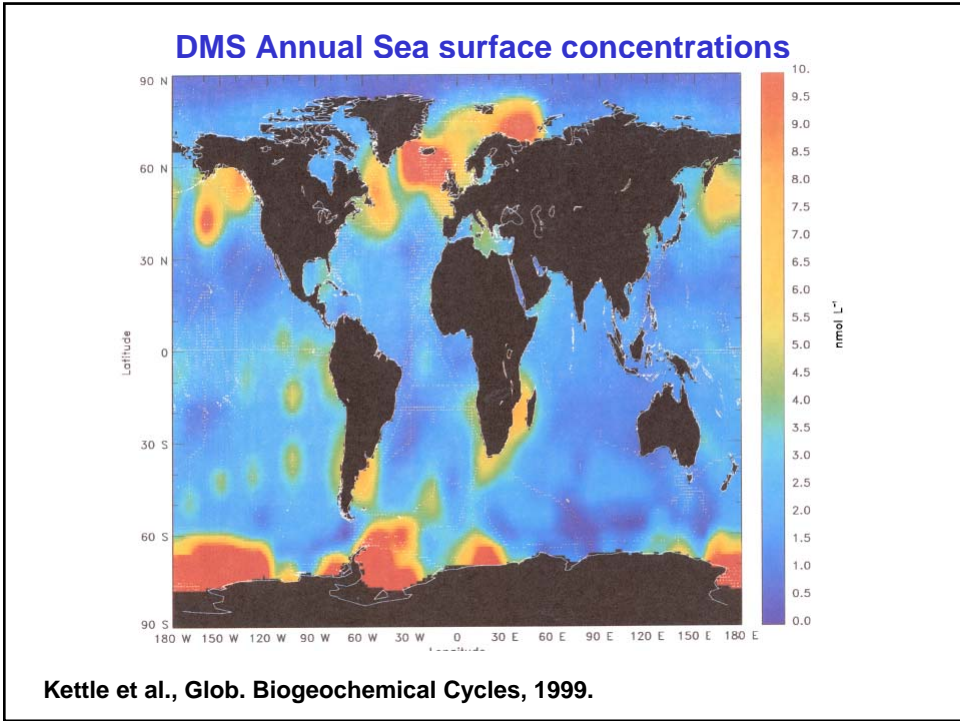
Sources	Compound	Emissions
Oceans (without sea-salt)	DMS (CS_2 , OCS)	15-25
Volcanoes	SO_2 , SO_4^{2-} (H_2S , OCS)	9-12
Plants + Soils	SO_4^{2-} , H_2S (DMS, CS_2)	0.2-1
Fossil Fuel Combustion (+industry)	SO_2 (SO_4^{2-} , H_2S , CS_2)	70-80
Biomass Burning	SO_2 (SO_4^{2-} , OCS)	2-3
	Total	98-120

Sinks	Compound	Emissions
Dry Deposition	SO_2 , SO_4^{2-}	50-60
Wet Deposition	SO_2 , SO_4^{2-}	50-60

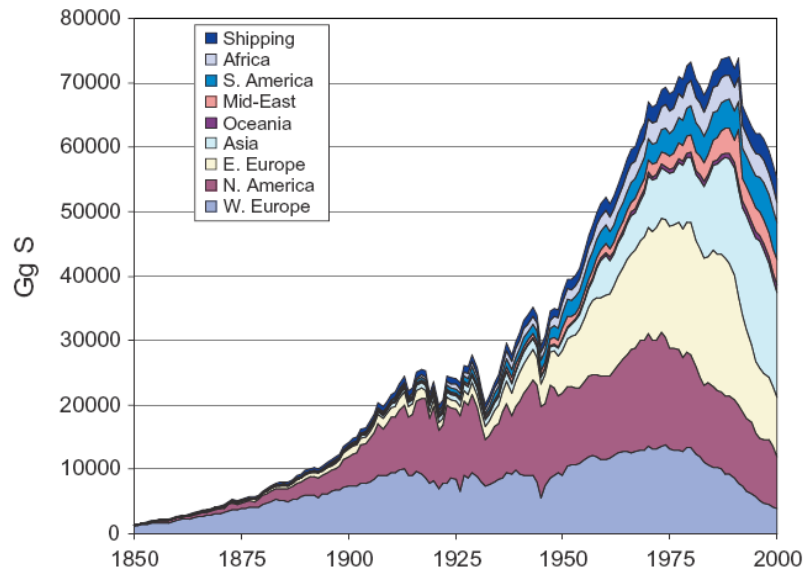
Seinfeld & Pandis, 1998.





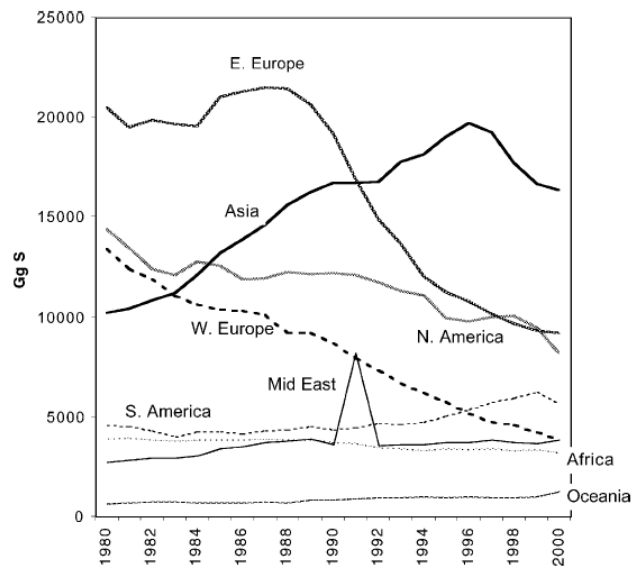


Trends in Anthropogenic Sulfur emissions (1850-2000)



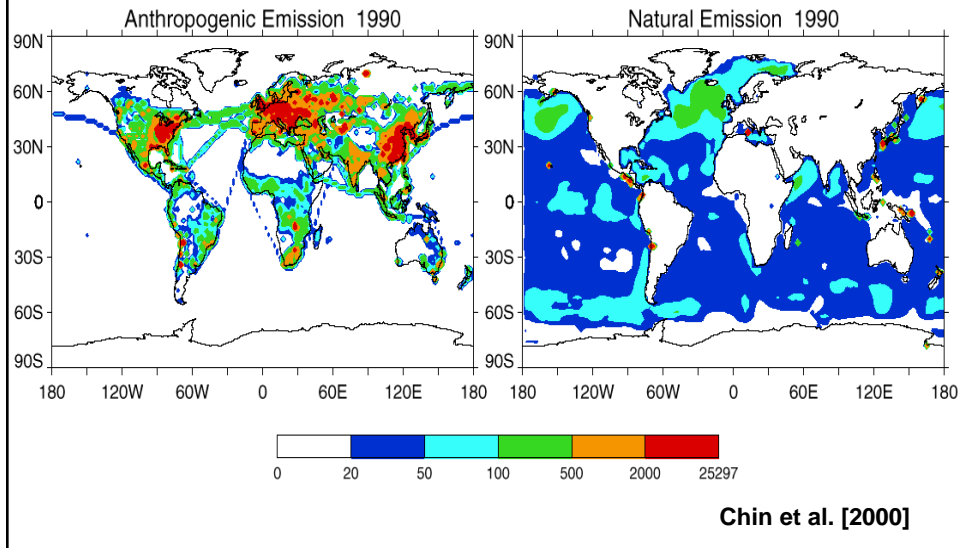
Stern, Chemosphere 58 (2005)

Recent Trends in Sulfur Emissions (1980-2000)



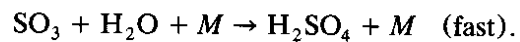
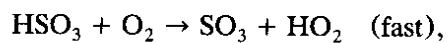
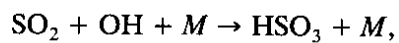
Stern, Chemosphere 58 (2005)

GLOBAL SULFUR EMISSION TO THE ATMOSPHERE 1990 annual mean



Oxidation of SO₂

- **Gas-phase oxidation of SO₂ (~15% of total**



- **Aqueous phase oxidation of SO₂ (~85% of total oxidation)**

