

Smoke Bugs

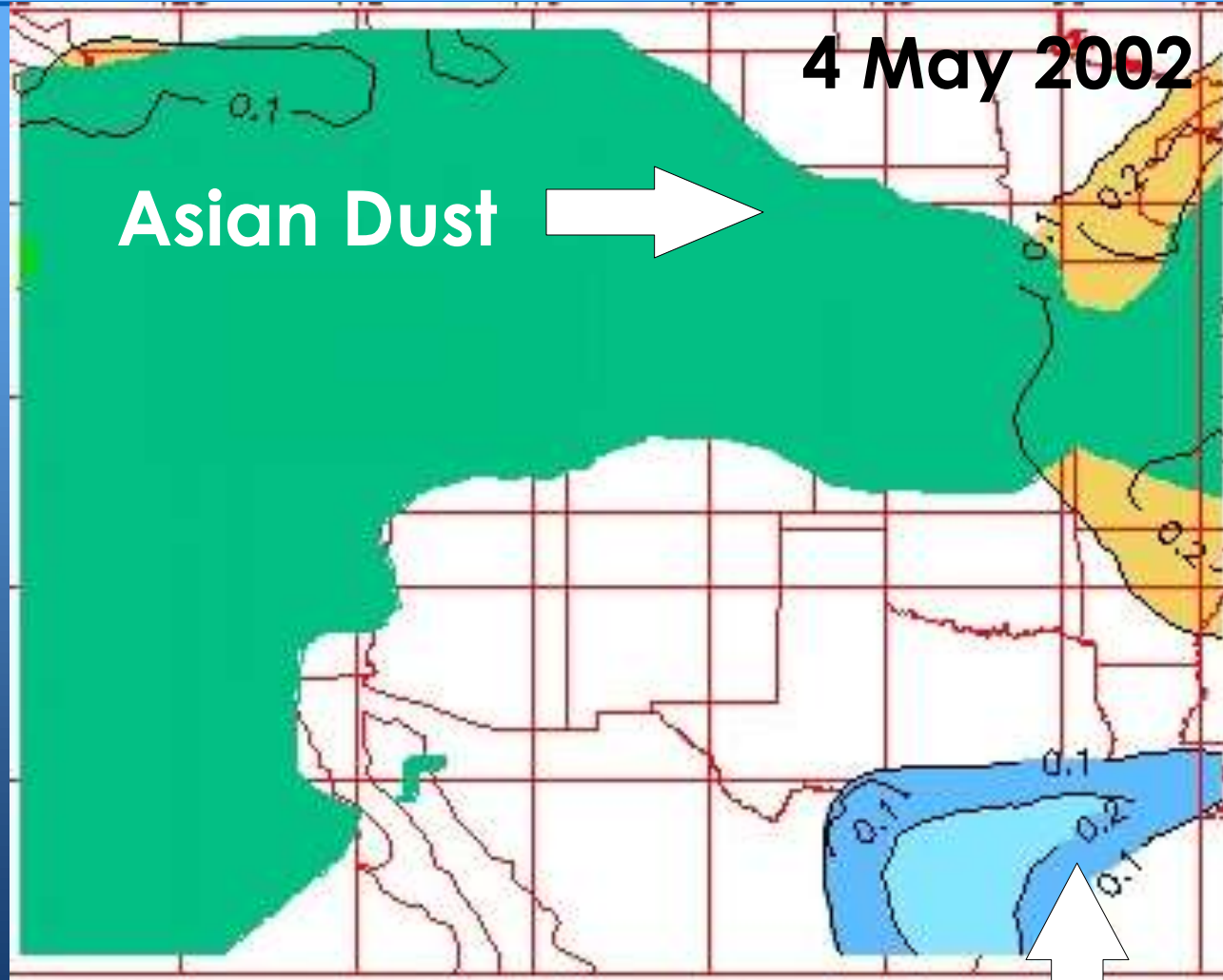
Fungal spores are transported in smoke
from biomass fires.

Sarah Mims

sarahmims@gmail.com

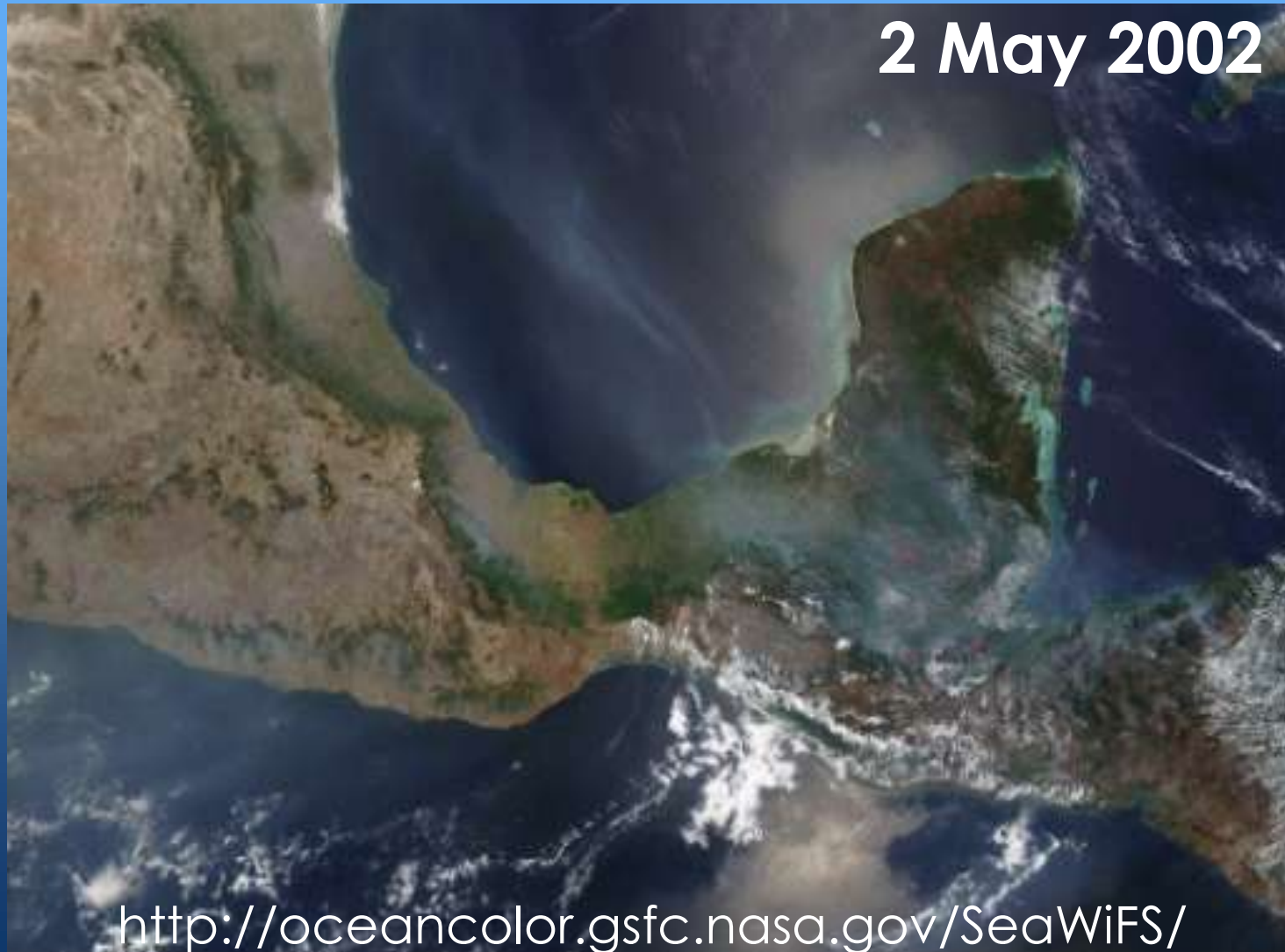
NAAPS Model

<http://www.nrlmry.navy.mil/aerosol/>



Central American Smoke

Smoke from Yucatan in SeaWiFS Satellite Image



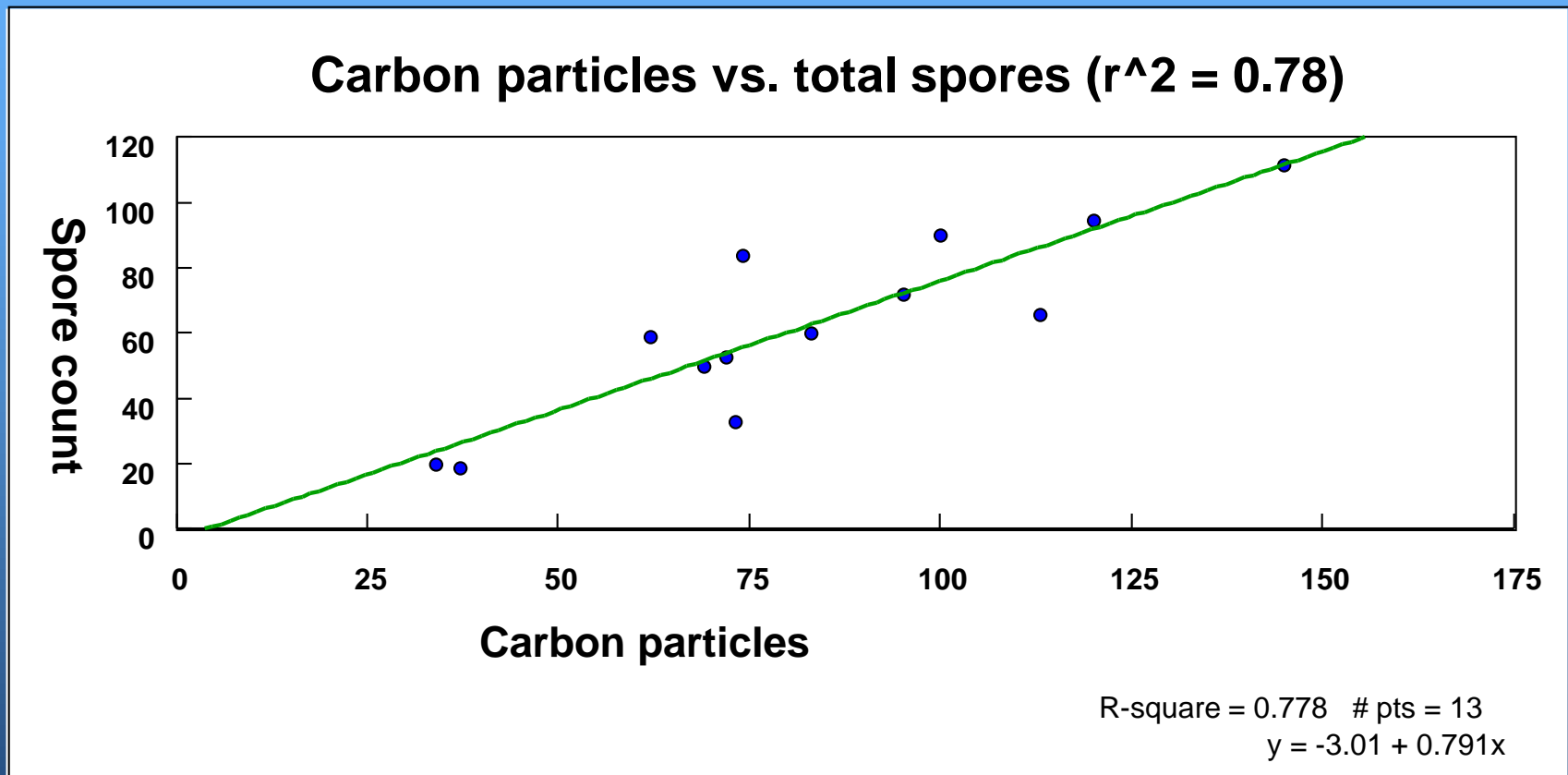
Various Fungal Spores During 2002 Central American Smoke Study



Microscope Slide Analysis



Scatter Graphs of Fungal Spores and Coarse Carbon Particles



Overall high correlation suggests that many spores were associated with Central American smoke.

Gulf Coast Smoke Studies



Air sampler being flown from kite at Padre Island, TX.

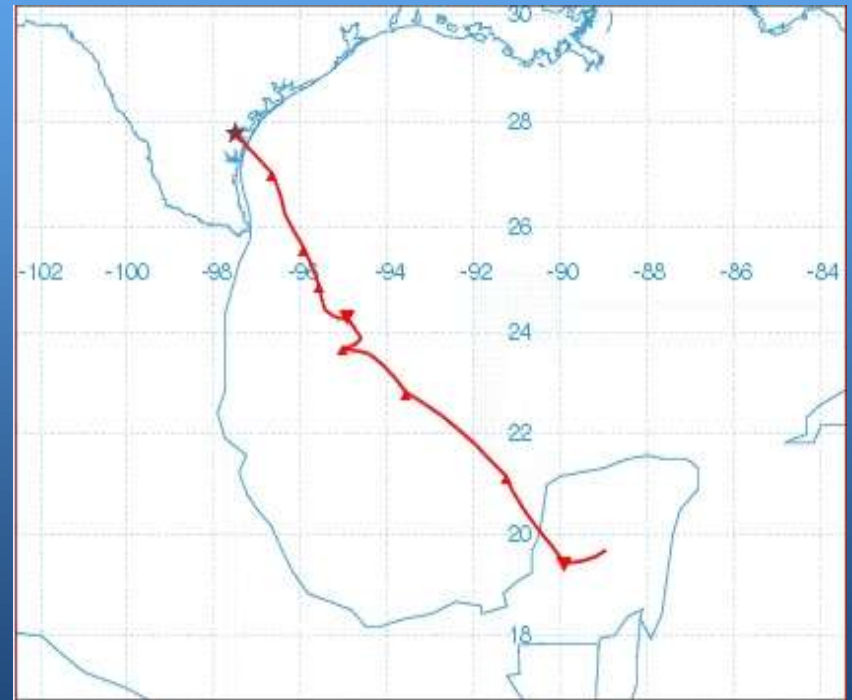
Gulf Coast Smoke Study

3-4 May 2003



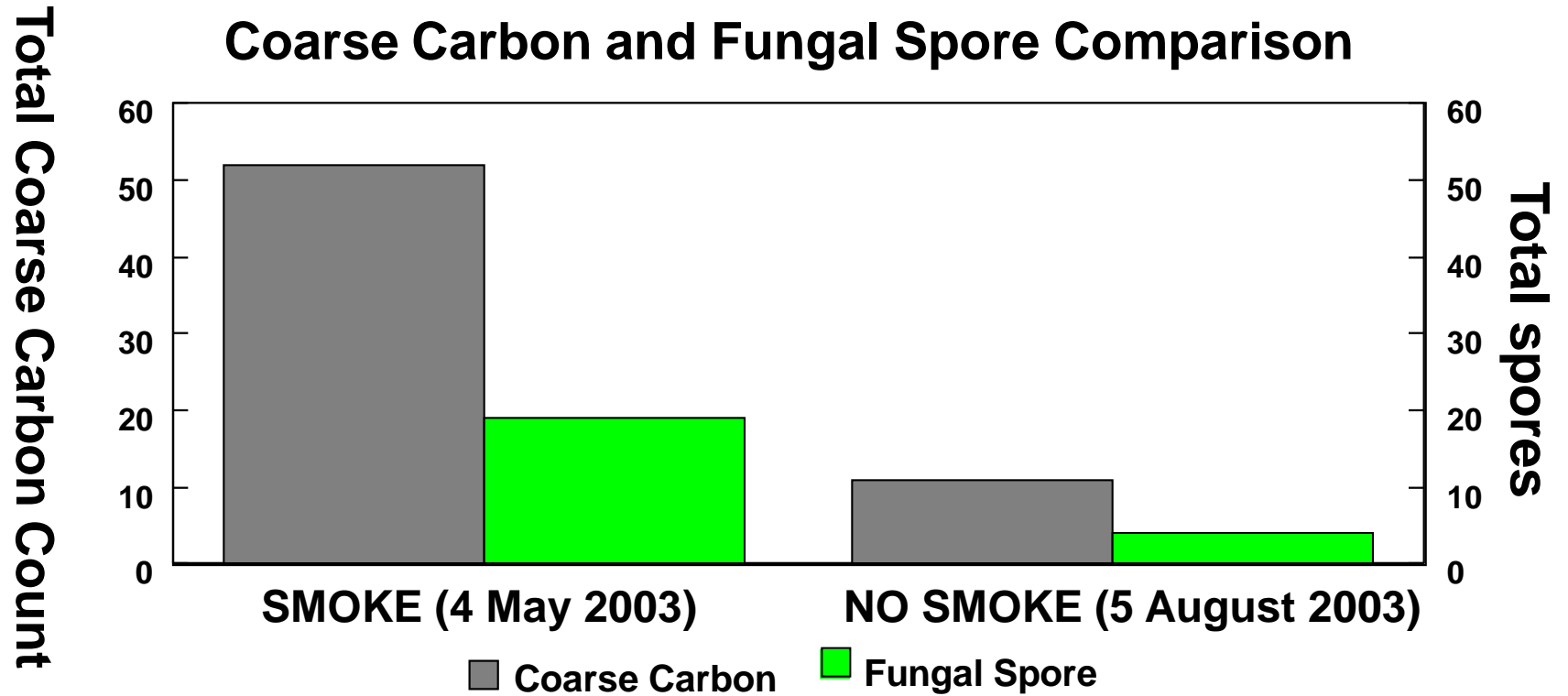
Smoke

5 August 2003



No Smoke

Gulf Coast Smoke Study



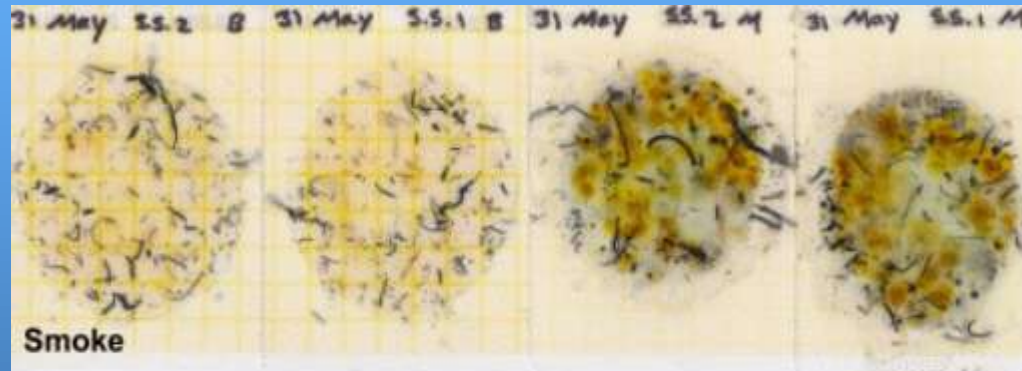
Validation Smoke Study 1



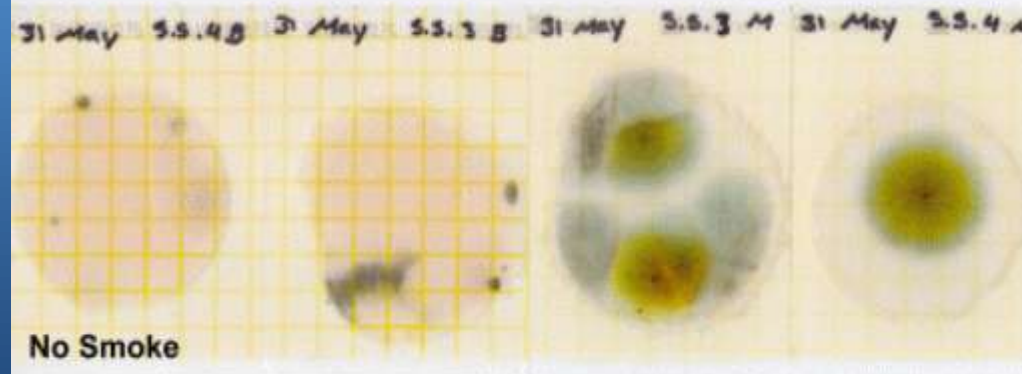
Petriefilms exposed to burning biomass.

Validation Pilot Study

Smoke



No Smoke



Petrifilms exposed to smoke from burning Johnson grass.

Was it worth the effort?



Fungal spores are transported long distances in smoke from biomass fires

Sarah A. Mims, Forrest M. Mims III*

Geronimo Creek Observatory, 433 Twin Oak Road, Seguin, TX 78155, USA

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Abstract

Viable fungal spores are present in smoke from distant biomass fires. This finding has potentially important implications for prescribed burning, agricultural management and public health. While attempting to find fungal spores in dust blown from China to Texas, one of us (S.A.M.) discovered that smoke from Yucatan contains viable bacteria and fungal spores, including the genera *Alternaria*, *Cladosporium*, *Fusariella* and *Curvularia*. There was a high correlation ($r^2 = 0.78$) of spores and coarse carbon particles collected on microscope slides during 13 days of the 2002 smoke season. To eliminate possible contamination by local spores, an air sampler was flown from a kite at a Texas Gulf Coast beach during and after the 2003 smoke season on days when the NOAA back trajectory showed air arriving from Yucatan. Fifty-two spores and 19 coarse black carbon particles ($> 2.5 \mu\text{m}$) were collected during a 30-min kite flight on the smoke day and 12 spores and four carbons on the day without smoke. We have found spores in smoke from an Arizona forest fire and in Asian smoke at Mauna Loa Observatory, Hawaii. We have tested these findings by burning dried grass, leaves, twigs and flood detritus. The smoke from all test fires contained many spores.