National Atmospheric Deposition Program

2013 Annual Meeting and Scientific Symposium
Western U.S. Monitoring and Analysis: Progress and Current Issues
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UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO
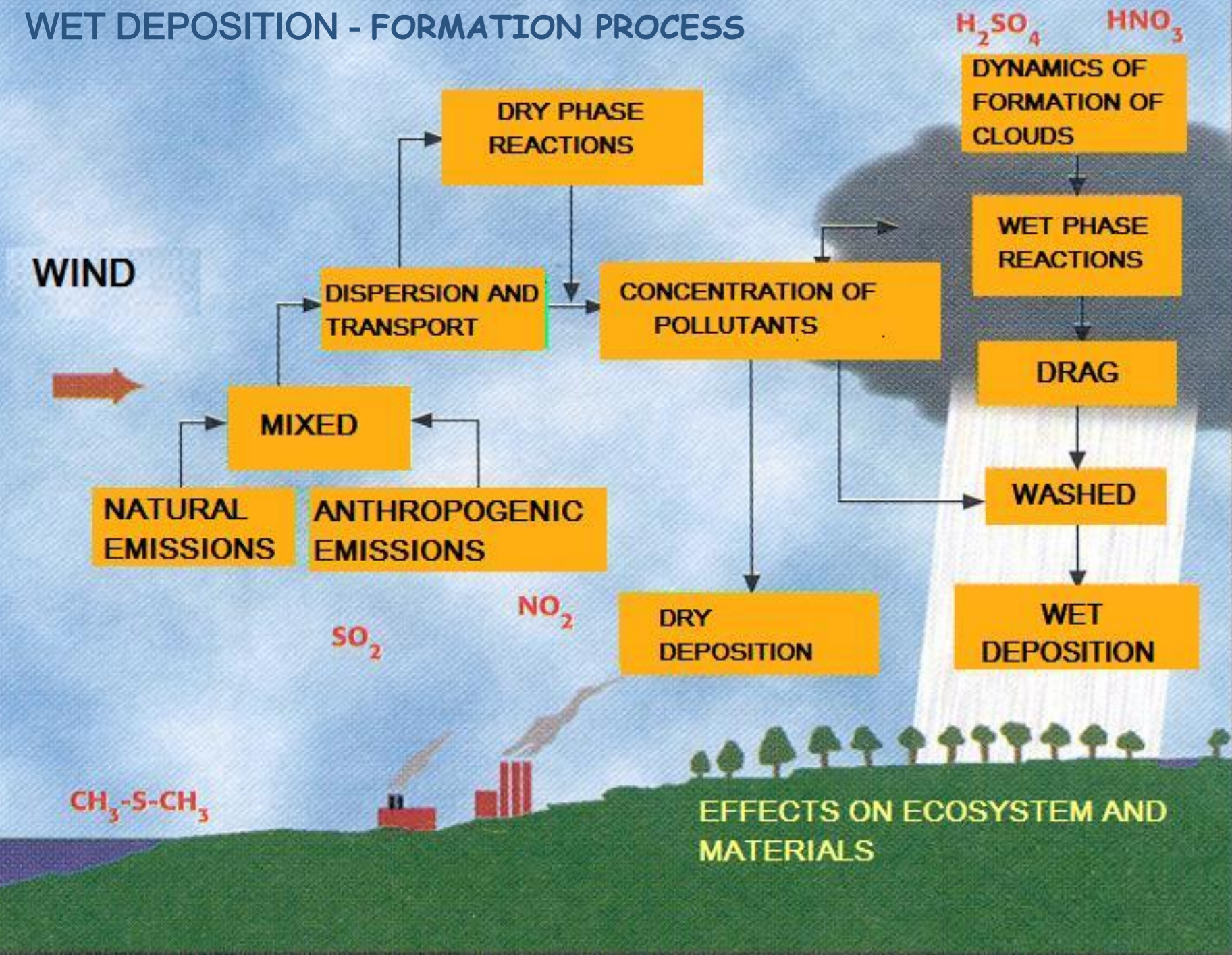## CENTRO DE CIENCIAS DE LA ATMÓSFERA
SECCIÓN DE CONTAMINACIÓN AMBIENTAL

ACID WET DEPOSITION IN THE MEXICO CITY METROPOLITAN ZONE (MCMZ).

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María del Carmen Torres B.*, Pablo Sánchez A.*, Ana Luisa Alarcón J.*
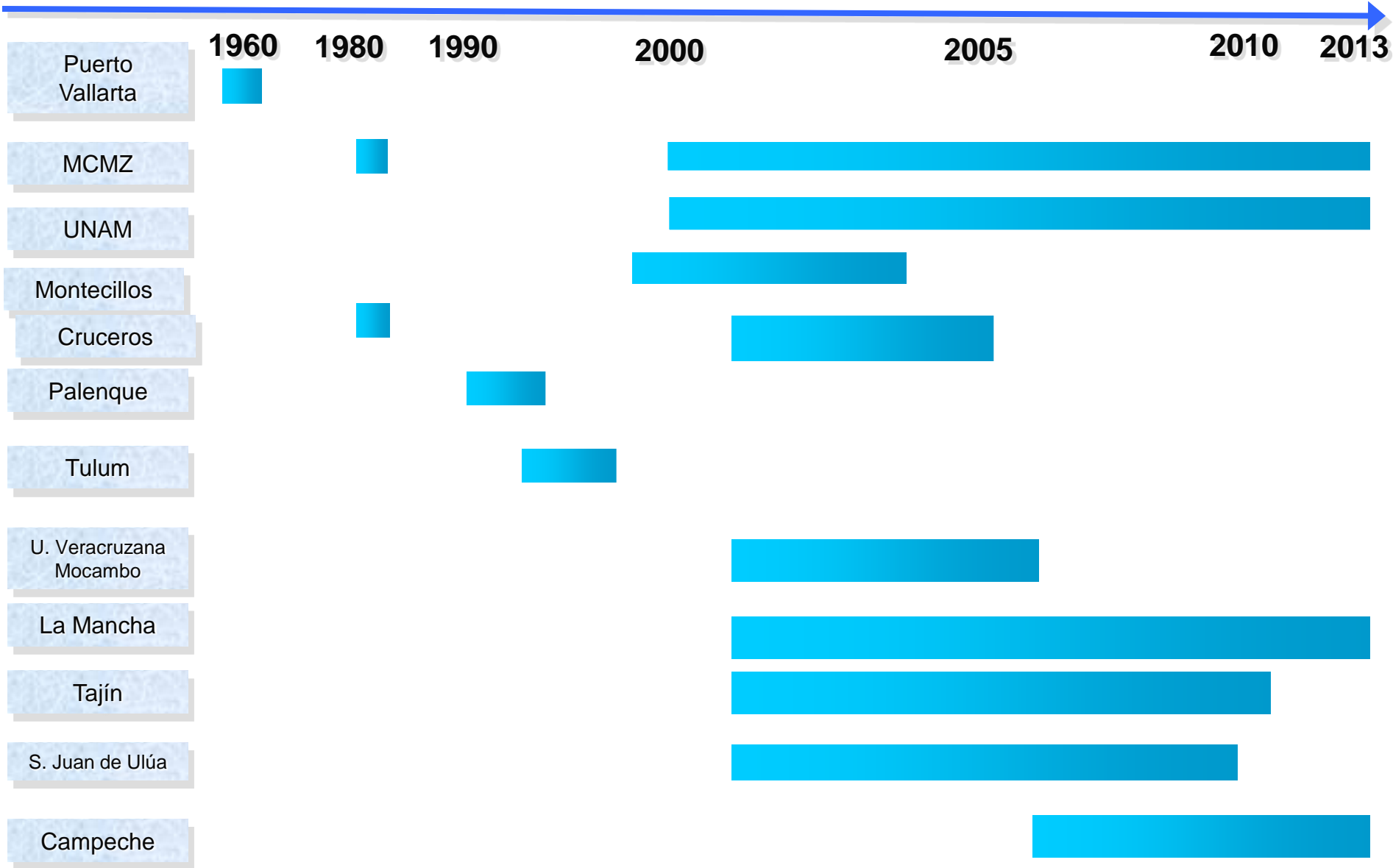Armando Retama H.**, Olivia Rivera H.**

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WET DEPOSITION - FORMATION PROCESS

H_2SO_4 HNO_3

DYNAMICS OF FORMATION OF CLOUDS

DRY PHASE REACTIONS

WIND

WET PHASE REACTIONS

DISPERSION AND TRANSPORT

CONCENTRATION OF POLLUTANTS

DRAG

MIXED

NATURAL EMISSIONS

ANTHROPOGENIC EMISSIONS

WASHED

NO_2

SO_2

DRY DEPOSITION

WET DEPOSITION

CH_3-S-CH_3

EFFECTS ON ECOSYSTEM AND MATERIALS

Chronology acid rain studies in Mexico

Sampling Acid Deposition Network in Mexico

Stations by Atmospheric Deposition Network of the Government of Mexico City.

- Estación de monitoreo
- Distrito Federal
- Delegación o municipio
- Curvas de nivel

Veracruz

Mexico City

Stations List Operated by SCA CCA UNAM.

1. Tajín, Veracruz.
2. El Morro, Veracruz.
3. San Juan de Ulua, Veracruz.
4. Instituto de ingenieria, UV.
5. Villahermosa, Tabasco.
6. Palenque, Chiapas.

7. Campeche, Campeche.
8. Tulúm, Quintana Roo.
9. Monterrey, Nuevo León.
10. Tijuana, Baja California.
11. Montecillos, Estado de México.
12. Ciudad Universitaria, México City.

300 km

SCA/CCA/UNAM
NOAA
Secretaría de Marina

Rain Colector and TSP

1986
Gulf of Mexico
Cruise

Gulf of Mexico Cruise

SO$_2$ emissions in MCMZ

SO$_2$ Tons/Year

0.1 - 1
1 - 6
6 - 52
52 - 120
120 - 246

Km

7   0   7   14   21

N

GDF-SMA-DPCAIE, 2007

Wind Velocity

(m/s)

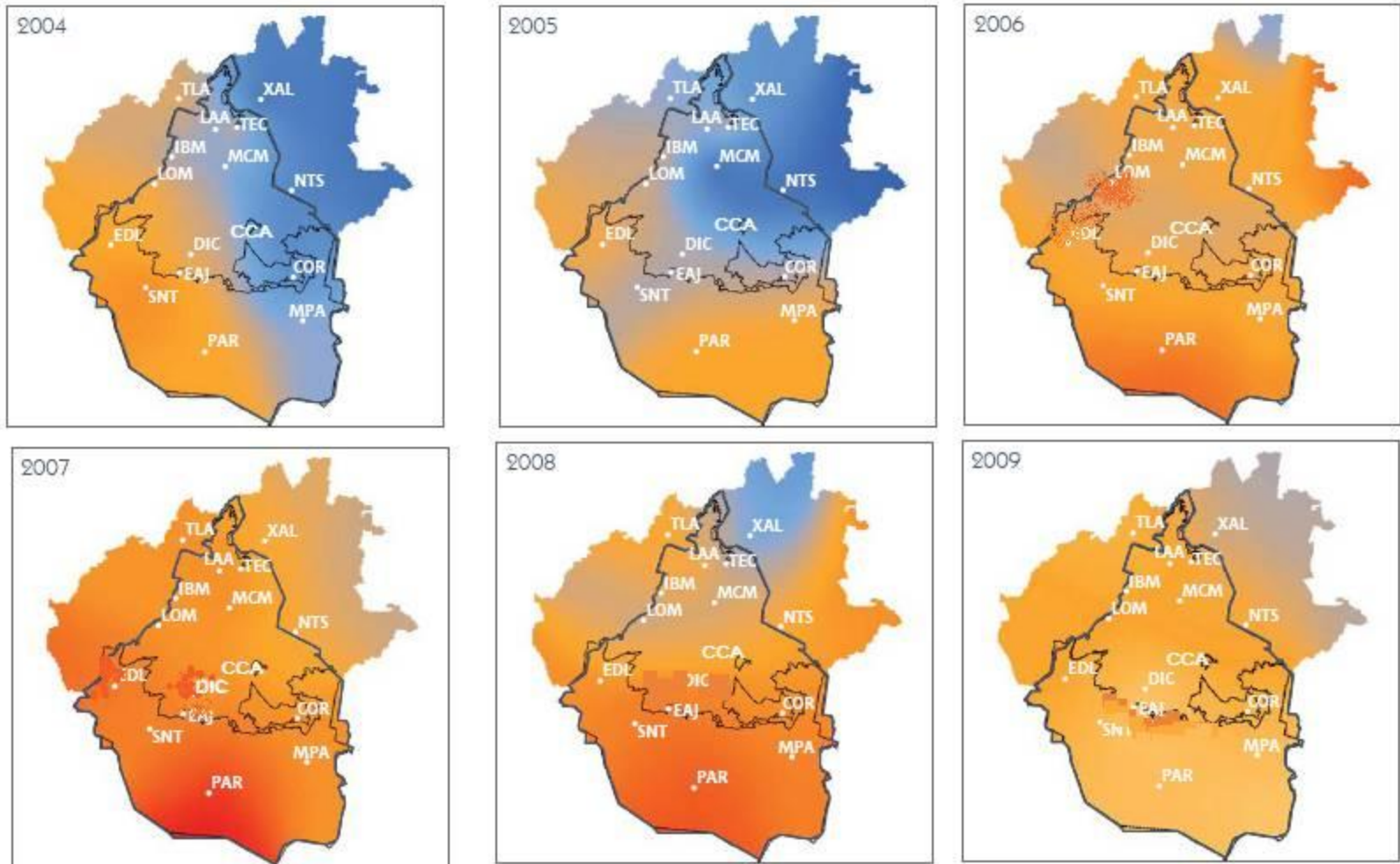|	
■	>= 10.8
■	8.1 - 10.8
■	5.6 - 8.1
■	3.3 - 5.6
■	1.7 - 3.3
■	0.5 - 1.7
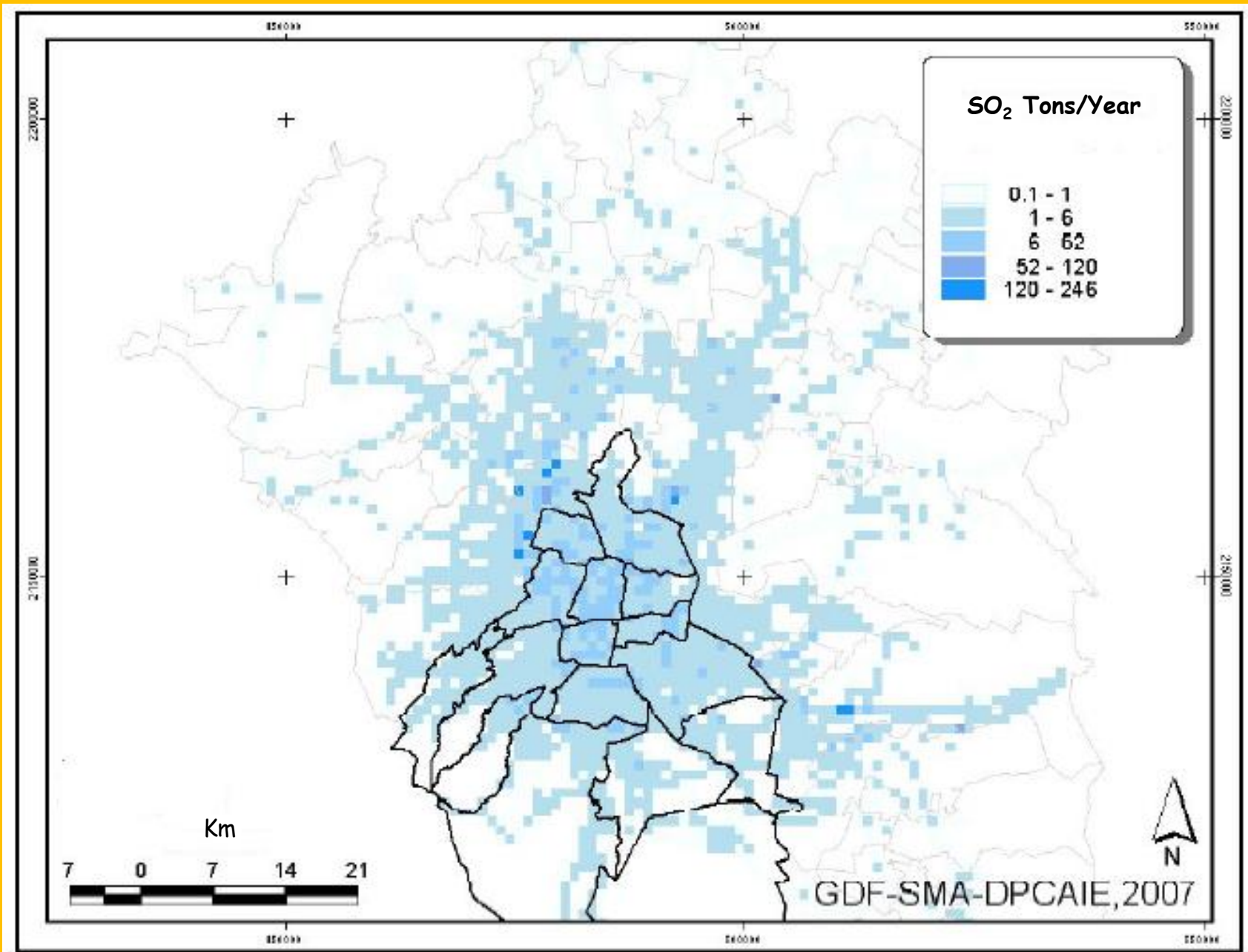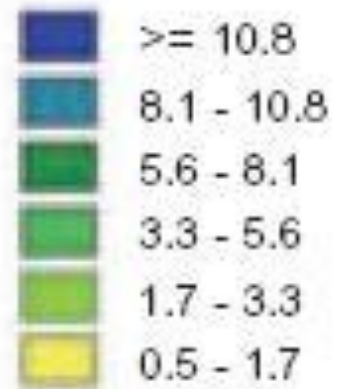
Calms: 2.33%

Preveling winds 10:00hs to 13:00hs, MCMZ.

pH DISTRIBUTION

Source: SMA. Informe anual de Calidad del aire 2009.

pH VALUE

4,5   5.0   5.5   6.0   6.5   7.0
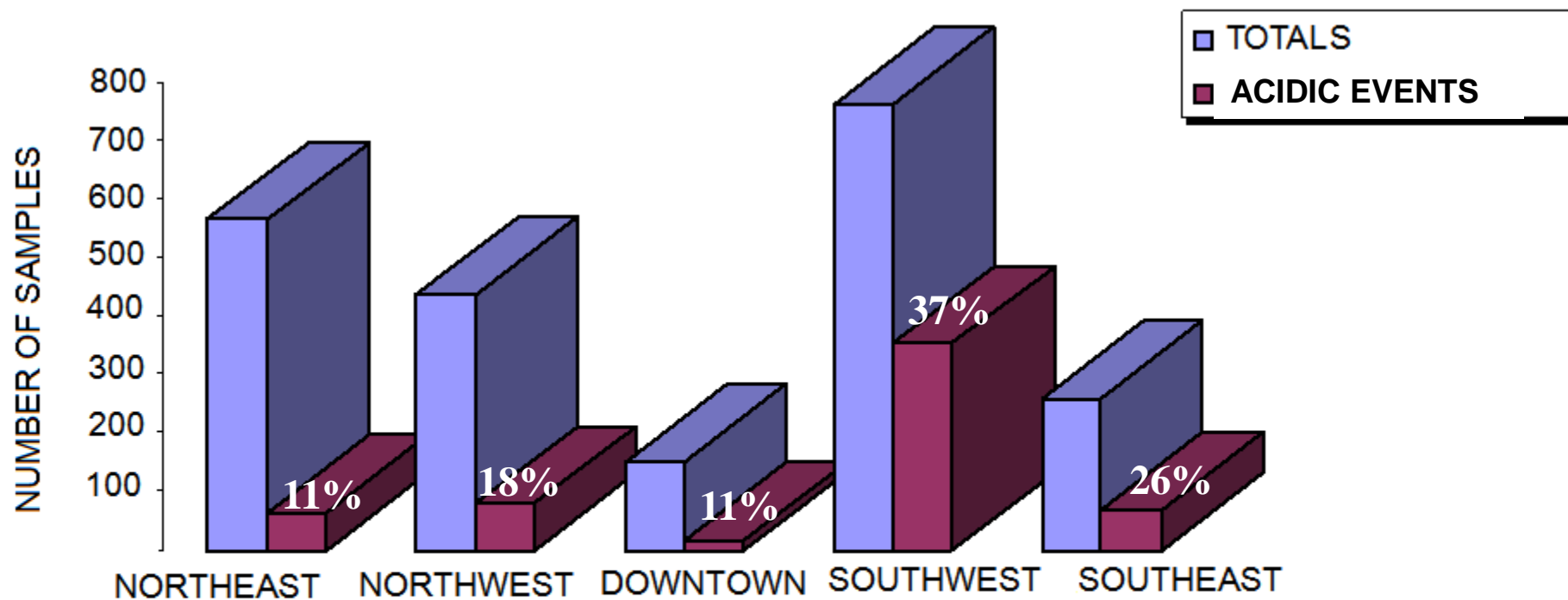
CONCLUSIONS AND RECOMMENDATIONS

• The acidity increased from the North to the South part of the Metropolitan Area. An annual acidity of 4.16 was recorded at the LOM Station in the Southwest region (2006).

• The acidic samples collected in the Southwest represent 37% of all samples collected in this region. The PAR station had more of the acidic events.

• After 2003, there was an increase in the acidity in all sampling sites.

CONCLUSIONS AND RECOMMENDATIONS

• The ratio of sulphate with H^+ ion, displays a maximum of 45% for the Southwest and 25% for other regions.

• It is recommended to identify the source of the precursors of acid wet deposition with the application of back trajectory model.

• It is recommended that Latin American Countries follow strict protocols for sampling and analysis to obtain data which can be compared at national and international levels.

THANK YOU!