UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
HANDS-ON, MINDS-ON
METEOROLOGY
DEPARTMENT OF ATMOSPHERIC SCIENCES
DAS
UIUC

Air Pollution & Meteorology

WHAT YOU SHOULD LEARN IN THIS EXERCISE:
- How meteorology affects pollution concentrations

Part A: Background Information

Your TA will explain how meteorology contributes to the formation of a high air pollution episode

Part B: Getting Started

B1. Launch a web browser and direct it to "Smog City"
http://www.smogcity.com

B2. Choose the link on the left menu bar titled: "Run Smog City"

B3. What you will see is an idealized environment. You can change various factors that contribute to pollution and see how they affect the concentrations of ozone. The EPA Air Quality Guide for Ozone is shown below:

Air Quality Index

Index Value	Descriptor	Color
0 - 50	Good	Green
51 - 100	Moderate	Yellow
101 - 150	Unhealthy for Sensitive Groups	Orange
151 - 200	Unhealthy	Red
201 - 300	Very Unhealthy	Purple
301 - 500	Hazardous	Maroon

Good: No health impacts are expected when air quality is in this range.

Moderate: Unusually sensitive people should consider limiting prolonged outdoor exertion.

Unhealthy for Sensitive Groups: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.

Unhealthy: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

Very Unhealthy: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.

Hands-On Meteorology
Part C: Exploring Smog City

Variables are defined as the changeable elements of the simulation: temperature, depth of mixing layer, wind speed, cloud cover, population, and emissions. Mouse over to see what each emission category includes.

C1. Keep all the variables the same except for wind speed. How does changing the wind speed from slow, to moderate, to fast effect ozone concentrations?

C2. Keep all the variables the same except for temperature. How does changing the temperature from 80°F to 120°F effect ozone concentrations?

C3. Keep all the variables the same except for cloud cover. How does changing the cloud cover from clear to overcast effect ozone concentrations?

Hands-On Meteorology
Part D: Forecasting Ozone Concentrations from Weather Maps

D1. The map below shows conditions across the United States. Using the map as a guide
to meteorological conditions, and the Smog City simulation, forecast the ozone
concentrations for each city your TA states. Provide a reason for your forecast.

Take into account: cloud cover   wind speed   population

                          temperature   vehicle emissions

City	Ozone Forecast	Reasons
_____	_____	_____
		_____
		_____
_____	_____	_____
		_____
		_____

Current Surface

LT RAIN/DRIZZLE   MOD/HVY RAIN   FRZ RAIN/SLEET   LT SNOW/FLUR   MOD/HVY SNOW   FOG

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