- OFCM Special Session -

Atmospheric Transport and Dispersion Modeling Support for Homeland Security

Panel 2: ATD Research Needs and Priorities

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George Mason University

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NOAA/ARL/SORD

September 11, 2001 and increased worldwide terrorism vigilance has thrust ATD into:

- **public awareness**
- **political spotlight**

It is incumbent upon our scientific community and the Department of Homeland Security to conduct responsible ATD research to ensure efforts to safeguard our people, property, and infrastructure are effective

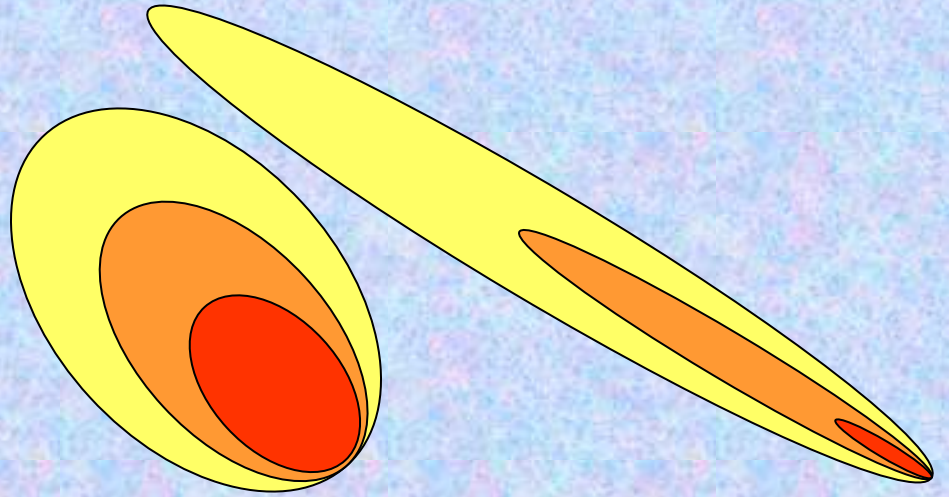
Conveyance of Threat

- **How do we define the "threat" from an ATD/ meteorological perspective?**

  - many variables and parameters determine the assessment (many degrees of freedom)

  - public impact (morbidity vs. mortality)

		POPULATION	
		rural	city
AREA	small		
	large		



Conveyance of Threat (cont.)

- **Presentation of information must be:**
  - **Credible and Accurate**
  - **Useable and Understandable**

Graphics	**vs.**	**Text**
flashy		lackluster
colorful		jargon
Memorable		
"good/bad" line		

- **Realistic Portrayal of Uncertainties is Crucial**

Continue local and regional studies

- **The study of smaller flow regimes (ie. urban street canyons, building interior HVAC transport) is important to extend our ATD assessment tools**
- **It is also important to increase our understanding of the regional scale flow phenomenon , which also affects ATD model outcomes**
- **Need better understanding of all ATD scales to sharpen our models that provide key protective action information after any event that disperses radiological, chemical, or biological agents**

Local and Regional Studies (cont.)

- **OKC Study**
  - **great example of important research**
  - **continued examination of the urban scale**
- **Prairie Grass II**
  - **need to continue to pursue this**
  - **evaluate and sharpen understanding of older theories**
  - **development of new hypotheses to improve codes**

Meso-scale/ATD model coupling

- **As computers continue to increase in execution speed and storage capacity; mesoscale models will**
  - **further increase resolution, and**
  - **better drive ATD models**
- **Continued work needs to be preformed to:**
  - **support,**
  - **benchmark**
  - **verify and validate**

  the increased detail of the data generated.

Meso-scale/ATD model coupling (cont.)

- **Extended capability results in the need to monitor and acquire more detailed higher resolution data to satisfy model input requirements**
- **Observations vs. Model generated data**
  - **appears to be a shift:**

    Observations => models
  - **Observations are occurring; not predicted to occur**
  - **Special operations and testing still use on-scene observations to support activities.**

Meso-scale/ATD model coupling (cont.)

As computers continually become more powerful and compact;

Field personnel armed with laptop, cell phone, on-scene weather observations, and ATD models become a Consequence Assessment "Army of One"

- **Interact directly with Response Commanders and other response personnel**
- **Provide timely and accurate protective action recommendations**

Wrap - up

- **“Pressing Needs” is a by-product of**
  - **current politics,**
  - **perceived pertinent issues**
  - **state of the 21st Century world.**
- **Pursue Threat Conveyance**
  - **sooner rather than later**
  - **education of public and user groups**

Wrap – up (cont.)

- **Collaboration and coordination**
  - **focus on the advancement of the science**
  - **“it’s all about the science”**