The Evolving Roles and Responsibilities of Federal Agencies in Providing Transport and Dispersion Support

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Office of Response and Restoration

Hazardous Materials Response Division

- Under the National Contingency Plan, NOAA provides scientific support to the Federal On-Scene Coordinator for spills of oil or other hazardous materials.

- Under ESF-10 of the Federal Response Plan DOC (NOAA) provides forecasts (old) Under ESF-11 DOC has restoration responsibilities (new).

- The joint NOAA and EPA CAMEO program provides tools for end users to meet regulatory needs of EPCRA and CAA-RMP

NOS Emergency Response Needs

- Develop, communicate, and apply practical and credible science in responding to risks and mitigating the consequences from spills and other hazards threatening coastal environments and communities.

- Provide continuity of support to First Responder constituents as part of joint EPA/NOAA EPCRA and OCA implementations (CAMEO)

Office of Response and Restoration

field presence

Coastal Protection and Restoration Division - CRC
Damage Assessment Center - DAC
Hazardous Materials Response Division - SSC
Office of Response and Restoration Headquarters - OR&R

Where does NOS fit into IMAAC?

- Local resources available to IMAAC through SSCs/CRCs/IACs (those and other NOAA resources can be accessed through NOAA HSOC representative).

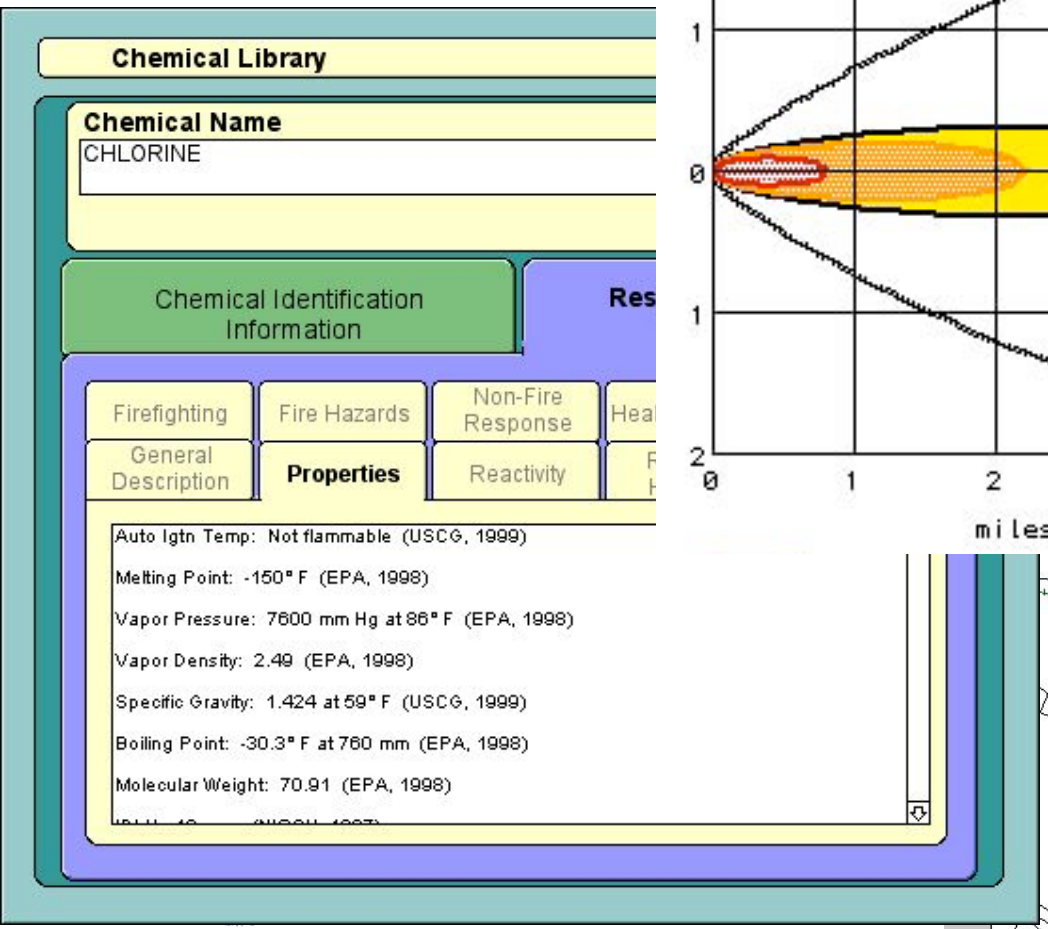
- Local agencies/first responders likely to have CAMEO/ALOHA. For HS incidents will need coordination or transition for Federal support.

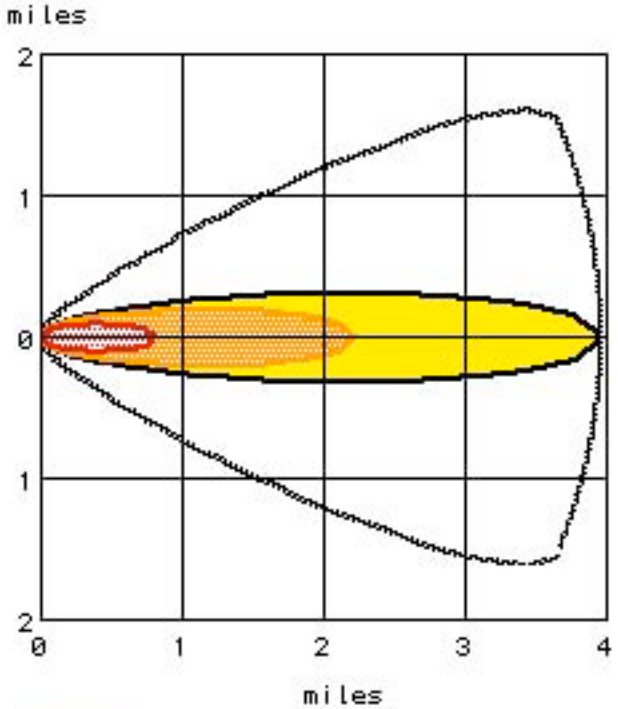
Joint NOAA/EPA Tools

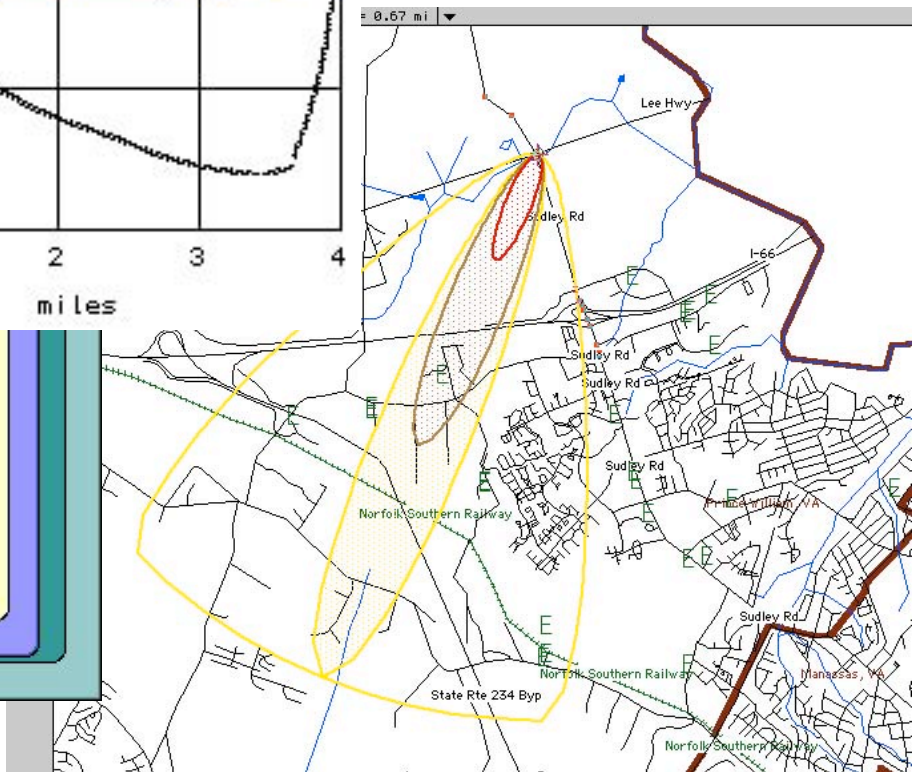
ALOHA

CAMEO

Marplot

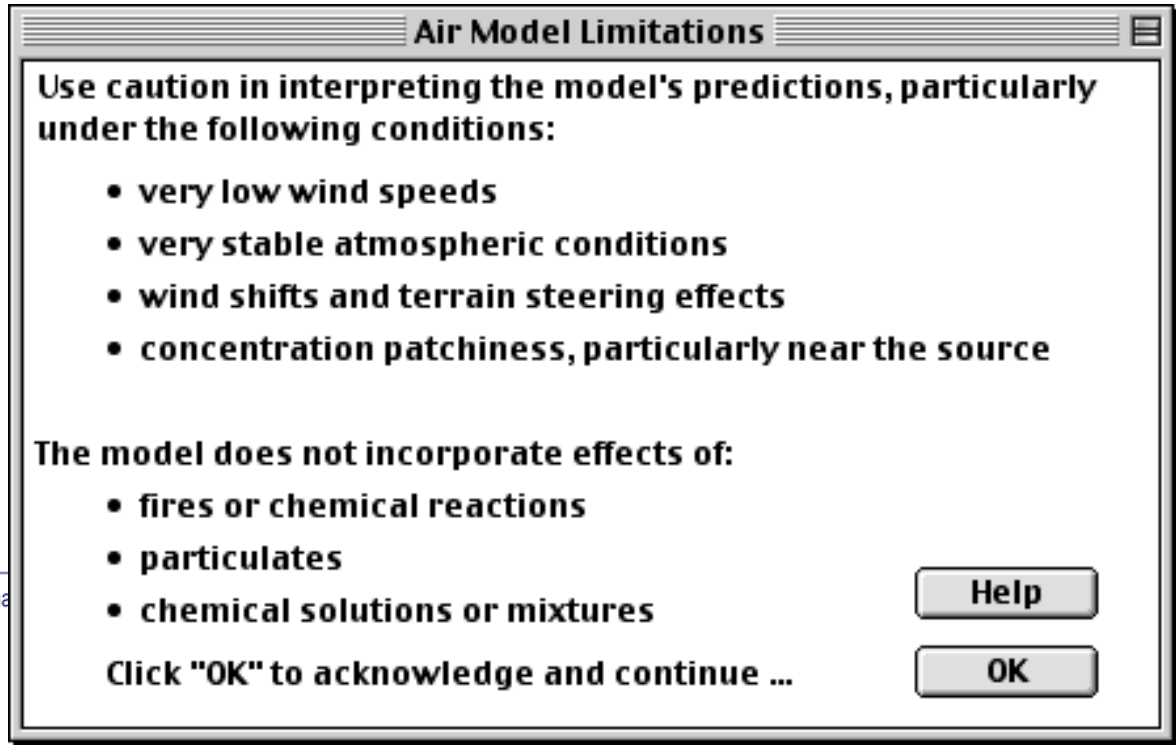






ALOHA is a Scaling Model

- Length/Time scale (10 km/60 minute)
- Industrial chemicals only (no rad, no bio)
- No multiple met data input capability
- No elevated dense-gas releases
- No time dependent meteorology
- No Complex topography



CAMEO

- CAMEO, ALOHA, MARPLOT
  - Over 100,000 downloads since May, 2002
  - 19 states use CAMEO to manage hazardous chemical inventory through the Tier 2 reporting requirements (>66,000 facilities)
  - Translated into multiple languages, introduced in over 50 countries by the UN/UNEP/APELL program
  - ODP/WMD training to be presented to over 5,000 first responders over next two years

History of ALOHA

- 1984 ALOHA 4.x and earlier versions
- 1986 ALOHA 4.x for outside distribution
- 1990 ALOHA 5.0 - Heavy Gas and S(t)
- 1992 ALOHA 5.1 - Windows version released
- 1995 ALOHA 5.2 - improvements in disp & source
- 1999 ALOHA 5.2.2 - chem lib changes, pipe changes
- 2002 ALOHA 5.2.3 - plotting changes, upgraded chems
- 2003 ALOHA 5.3 - aqueous slns, smart LOCs, comp.
- 2004 ALOHA 6.0 - flammables/explosives, NARAC links

Top five things we get asked for by First Responders

- Flammable/Explosive threat distances
- Releases over (onto) water
- Burn products and dispersion
- More source choices
- Liquids in pipes

Continued Development
Goal: Keep Focus on First Responder

- Flammables and Explosives
- Source strength calculations over water
- Enhance network/web capabilities

Our Response Gaps (ATD)

- Improvements in First Response tools
  - Science
    - Parameterizations (urban, shorelines, infiltration)
    - Uncertainty
    - Source characterizations (weaponized releases)
    - Averaging times (dispersion and toxicity)
    - Techniques for threat assessments (probability vs. ensemble)
  - Technology
    - Data transfer
    - I/O requirements
    - Conveying uncertainty
    - Rapidly deployable instrumentation and assimilation

HAZMAT and the IMAAC

- Reachback is a GOOD thing – what about non HS events?
- First responders will still need to scale the problem in the first few minutes of an event, then they'll need to know how to communicate with IMAAC and how to integrate additional information into response.
- Presenting probabilities is probably preferable!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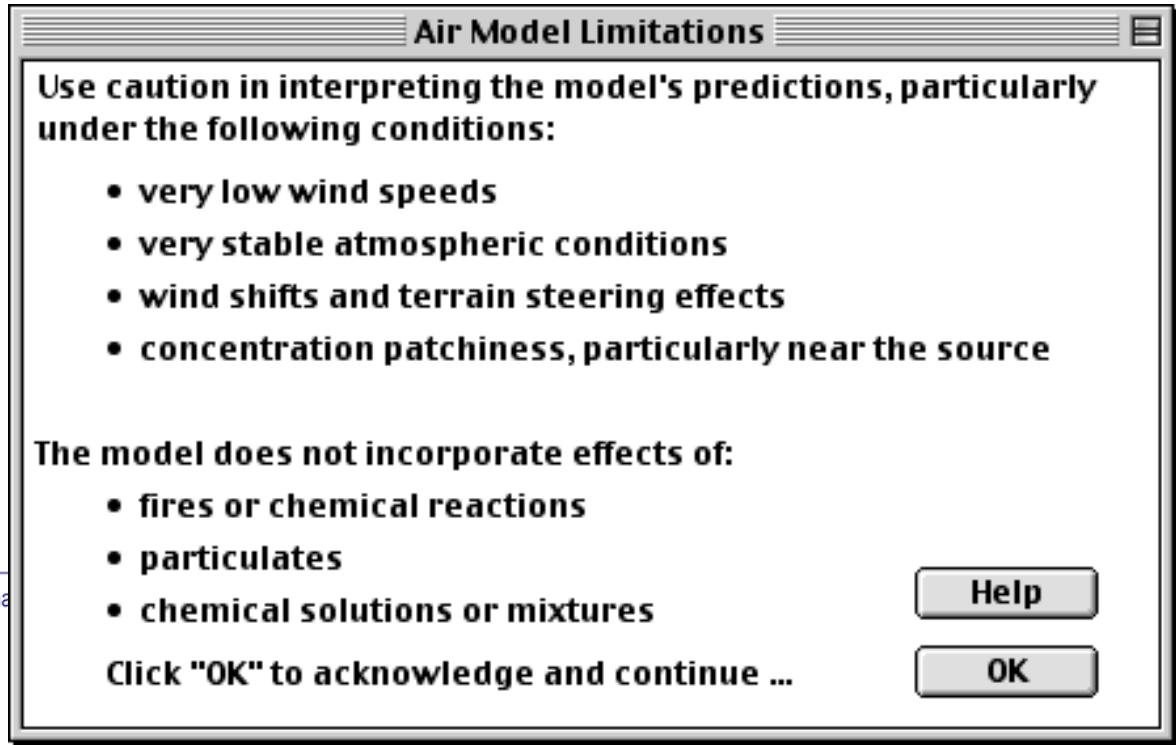
Design Challenges

- Data sparse environment
- Limited knowledge of uncertainty(ies)
- Guiding users to credible science



ALOHA Strengths

- Link to CAMEO (80K synonyms, 6K chems, 15K identification numbers, 10K organizations)
- Link to simple mapping capability (MARPLOT) as well as more complex GIS
- Training tool/intuition builder
- Usability, accessibility, fitness to purpose
- Transportability
- Responsive technical support, limited reachback

Present Design Criteria

- Quick to set up and run in the field
  - Cues for infrequent users
  - Ask ?s that can reasonably be answered
  - Minimize inputs/reasonable defaults
  - Variable I/O units

- Easily Interpreted Output
  - Graphical/text
  - Variety of output options

Stop !

HEXYLTRICHLOROSILANE reacts with any water it contacts to produce hydrochloric acid and heat. ALOHA does not model chemically reactive substances and cannot accurately predict the air hazard from the release of this substance if it comes in contact with water.

Do you wish to continue and model this chemical as if it were a non-reactive chemical?

Cancel **Yes** **Help**

Note !

This chemical may flash boil and/or result in two phas flow.

OK **Help**

NOTES and WARNINGS

Warning !

Override the stability class table ONLY if you are sure that special circumstances exist. Otherwise, click Cancel.

OK **Cancel** **Help**

Footprint Window

```
Dispersion Module: Gaussian
User-specified LOC: 100 ppm
Max Threat Zone for LOC:  14 yards
Note: Footprint was not drawn because
   effects of near-field patchiness make dispersion
   predictions unreliable for short distances.
```

Guidance

INSTRUCTIONS

You may know that tank temperature is near the boiling point, but not be sure whether it is above or below the boiling point. If this is the case, try running your scenario twice - first with tank temperature set to just below boiling, and again with temperature set above boiling. Compare the two sets of results produced by ALOHA to find the range of release rates possible for your scenario. Running a liquid release scenario at a temperature ABOVE BOILING will give you the HIGHEST release rate and LARGEST footprint.