

# Potential Upgrades to the INL Dispersion Modeling Provided by NOAA

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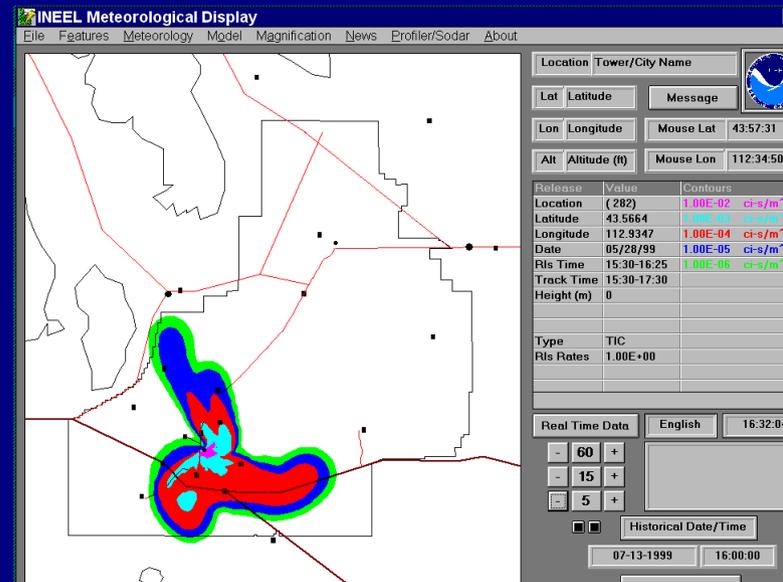
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# Limitations of Current MDIFF Model

- Resources now insufficient to maintain 100% “in-house” modeling system
  - Expensive to develop, maintain, upgrade, validate a model
  - Higher expectations than in past
  - No effective support from other parts of NOAA
- Existing system largely unchanged since 1990's
  - Still using OS/2
  - INLViz still DOS/Win3.1 based

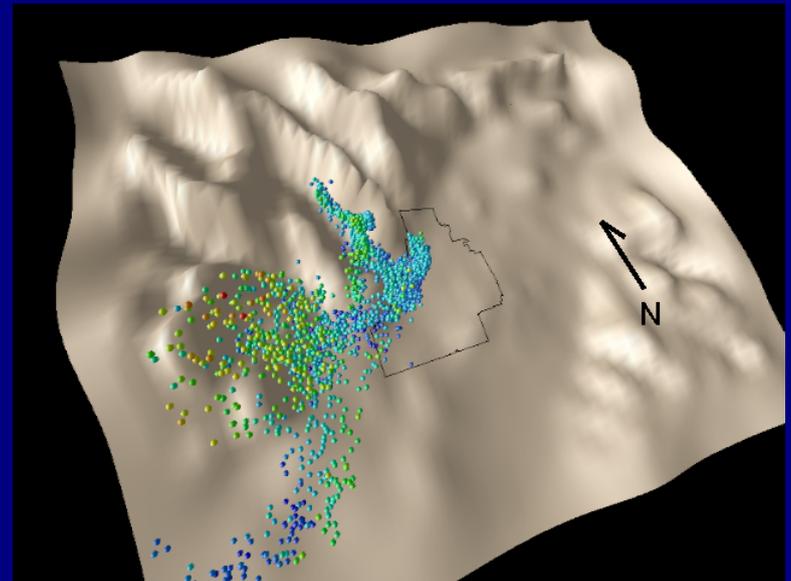
# MDIFF Technical Limitations

- Lacks deposition, radioactive decay, tracking of specific radionuclides
- Interpolated 2D wind field
- Mostly “nowcast” with very limited forecast capability
- Obsolescent algorithms
- Output often confusing for decision makers in EOC



# NOAA HYSPLIT Model

- Modern dispersion model with extensive support and widespread use
  - FRD can leverage limited resources through interaction with broader HYSPLIT community
  - Focus on INL issues
  - Benefits both DOE/INL and NOAA
- Options for simple or more complex configurations
  - Quick turnaround using simple configuration
  - More realistic runs when time permits



# HYSPLIT Technical Features

- Addresses most of the limitations of MDIFF
  - 3D wind field with topography effects
  - Deposition, decay, multiple species
  - Dispersion forecasts
  - Extensive validation
  - GIS output available
- Can be used beyond Mesonet coverage (e.g., Fort St. Vrain)

Deposition Definition for Pollutant 1

Set Simple Defaults-> Particle or Gas Dry Deposition Wet Deposition  
 Particle  Gas  Yes  No  Yes  No

Particle Diameter(um), Density(g/cc), Shape : 0.0 0.0 0.0

Vel(m/s), Mol Wgt(g), A-Ratio, D-Ratio, Henry: 0.0 0.0 0.0 0.0 0.0

Henry's(M/a), In-cloud(l/l), Below-cloud(1/s): 0.0 0.0 0.0

Radioactive decay half-life(days) : 0.0

Pollutant Resuspension Factor(1/m) : 0.0

Quit Done Help Reset

# Transition Issues

- INL specific graphical interface and output
  - Number crunching separate from graphics
- Development of INL release scenarios in format suitable for HYSPLIT
- Integration with Mesonet and local weather modeling
- New server setup, testing

# Funding

- Adjustment to annual budget preferable to lump sum
  - Lump sum will repeat existing stagnation
  - Small staff makes lump sum difficult to handle
  - Integration with other FRD programs
- Smaller initial sum for one-time costs + annual funding for model and graphics maintenance
  - 0.5 FTE modeling, 0.5 FTE graphics & IT
  - Rebuilding rather than “new” capability