From Surveillance to Intervention to Policy Change: Air Pollution Models & Public Health

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Objectives

- Describe how models were used to proactively address public health problems
- Characterize the process by which collaborative efforts brought about reductions in chemical exposure

Toxic Release Inventory (TRI)

U.S. Environmental Protection Agency

TRI Explorer

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2004 State Fact Sheet

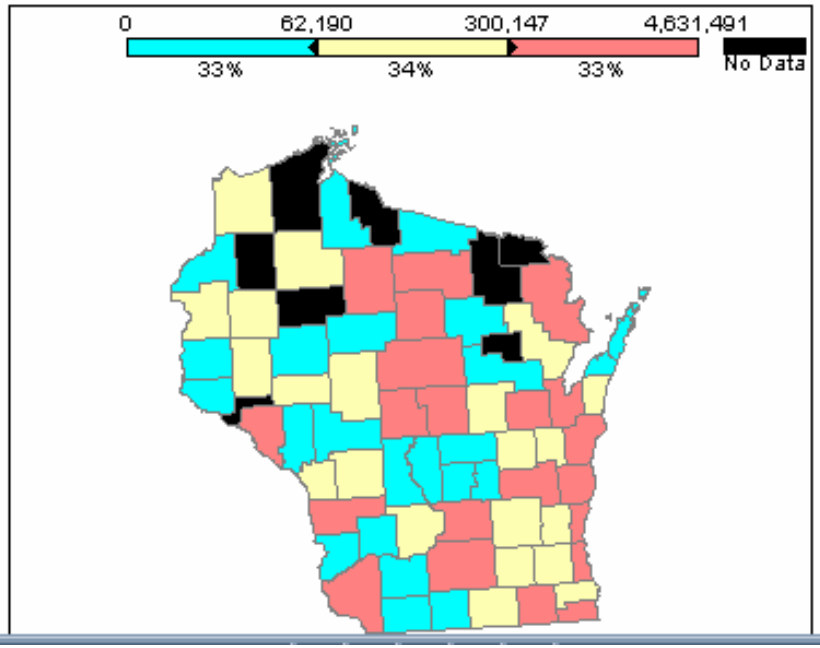
See Note Go To New Report

Wisconsin

Data source:2004 Data Update as of June 9, 2006

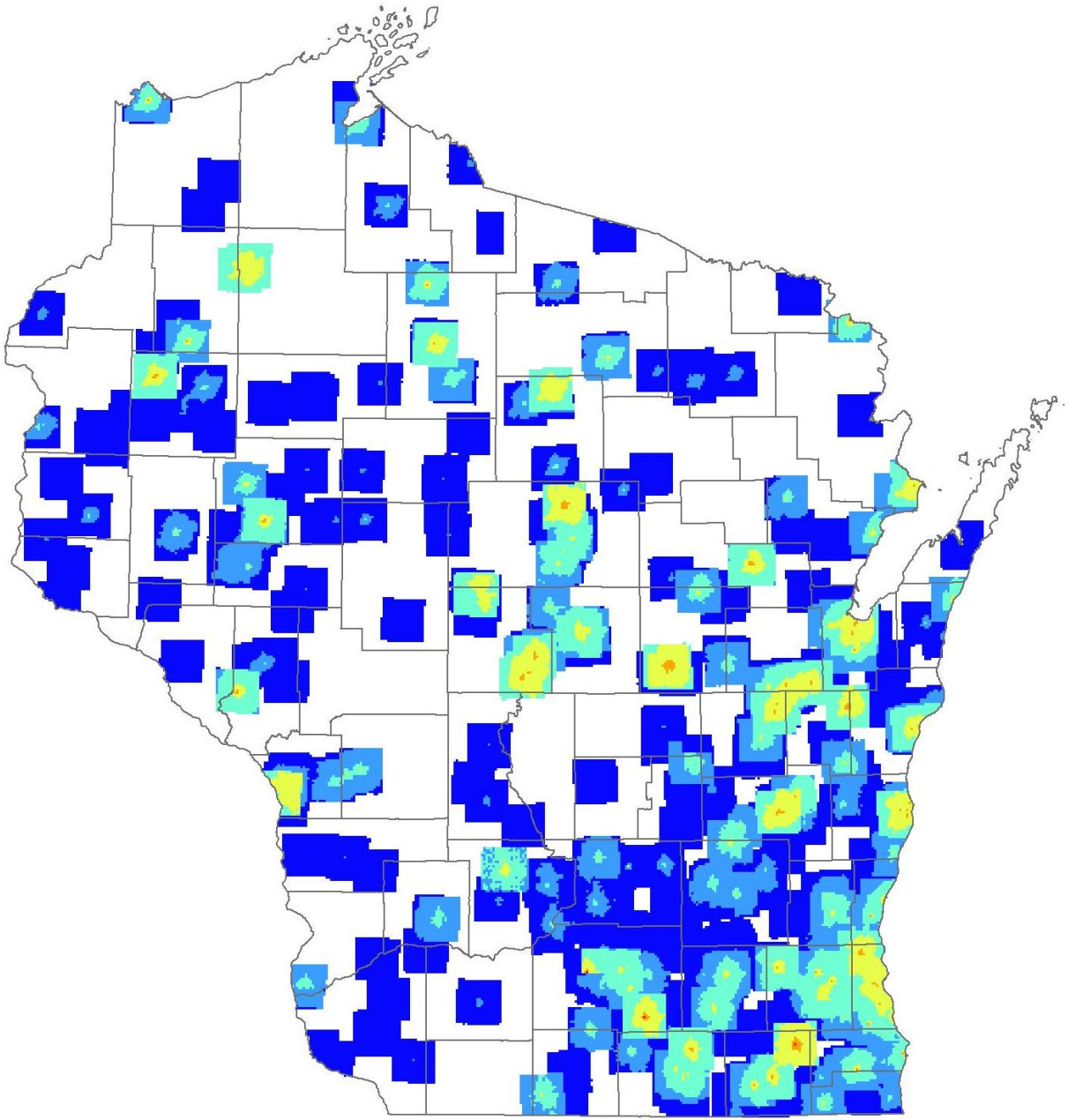
Reported Disposal or Other Releases and Other Waste Management Activities (in pounds)

	Total
On-site Disposal to Class I Underground Injection Wells, RCRA Subtitle C Landfills, and other Landfills	
Class I Wells	0
RCRA Subtitle C Landfills	0
Other Landfills	531,412
SubTotal	**531,412**
Other On-site Disposal or Other Releases	
Fugitive Air Emissions	2,051,245
Point Source Air Emissions	17,189,375
Surface Water Discharges	4,984,639
Class II-V Wells	0
Land Treatment	848,819
RCRA Subtitle C Surface Impoundment	54,867
Other Surface Impoundments	22,218
Other Land Disposal	393,145
SubTotal	**25,544,308**
Total On-site Disposal or Other Releases	**26,075,721**

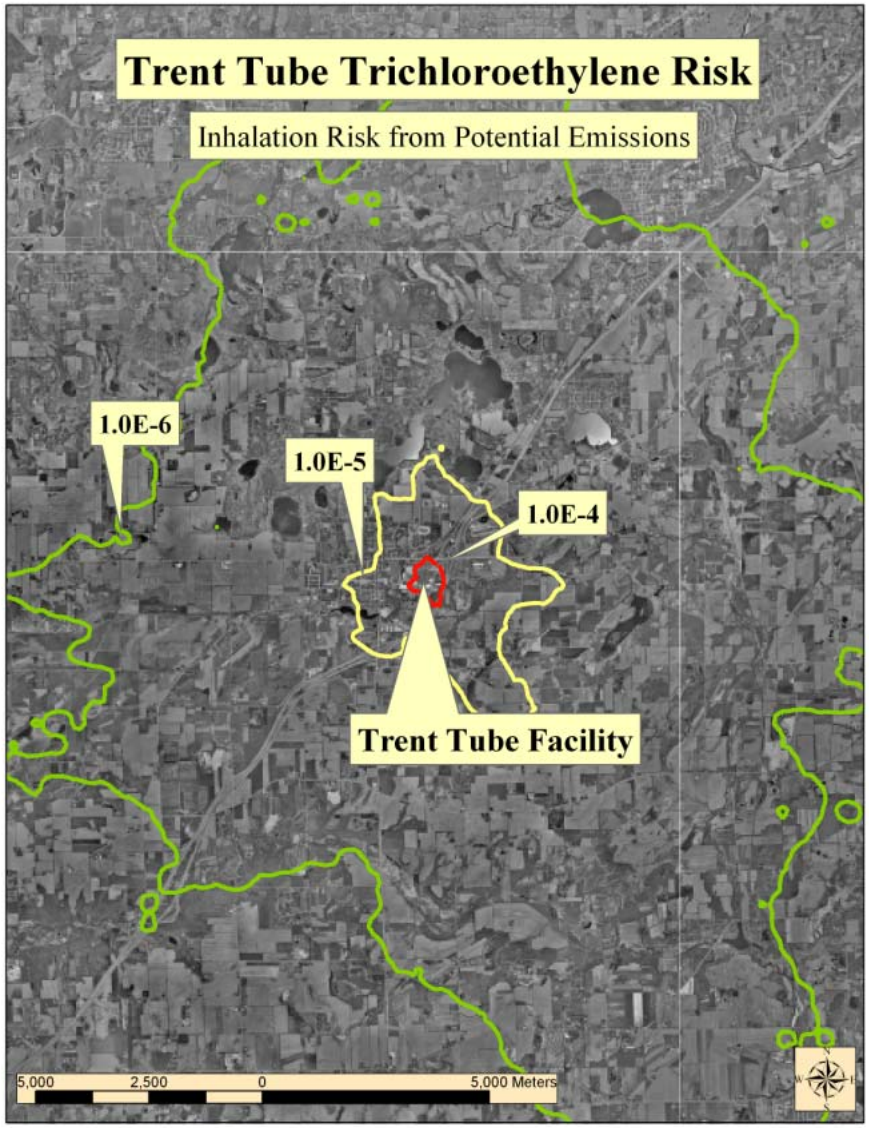


Response to Inquiry

- TRI data reviewed by WI DNR
- RAIMI (Regional Air Impact Modeling Initiative) output reviewed
  - Created by EPA Region 6 staff
  - Training, hardware and visual site verification provided by WI DHFS EPHT program
  - EPHT justification – development of tool for environmental health hazard surveillance



EPA RAIMI Model



- *Regional Air Impact Modeling Initiative*
- Multi-agency surveillance project.
- Predict combined risk from multiple contaminants/source.
- Cancer unit risk factor of 2×10^{-6} applied to modeled predictions of pollutant air concentrations.

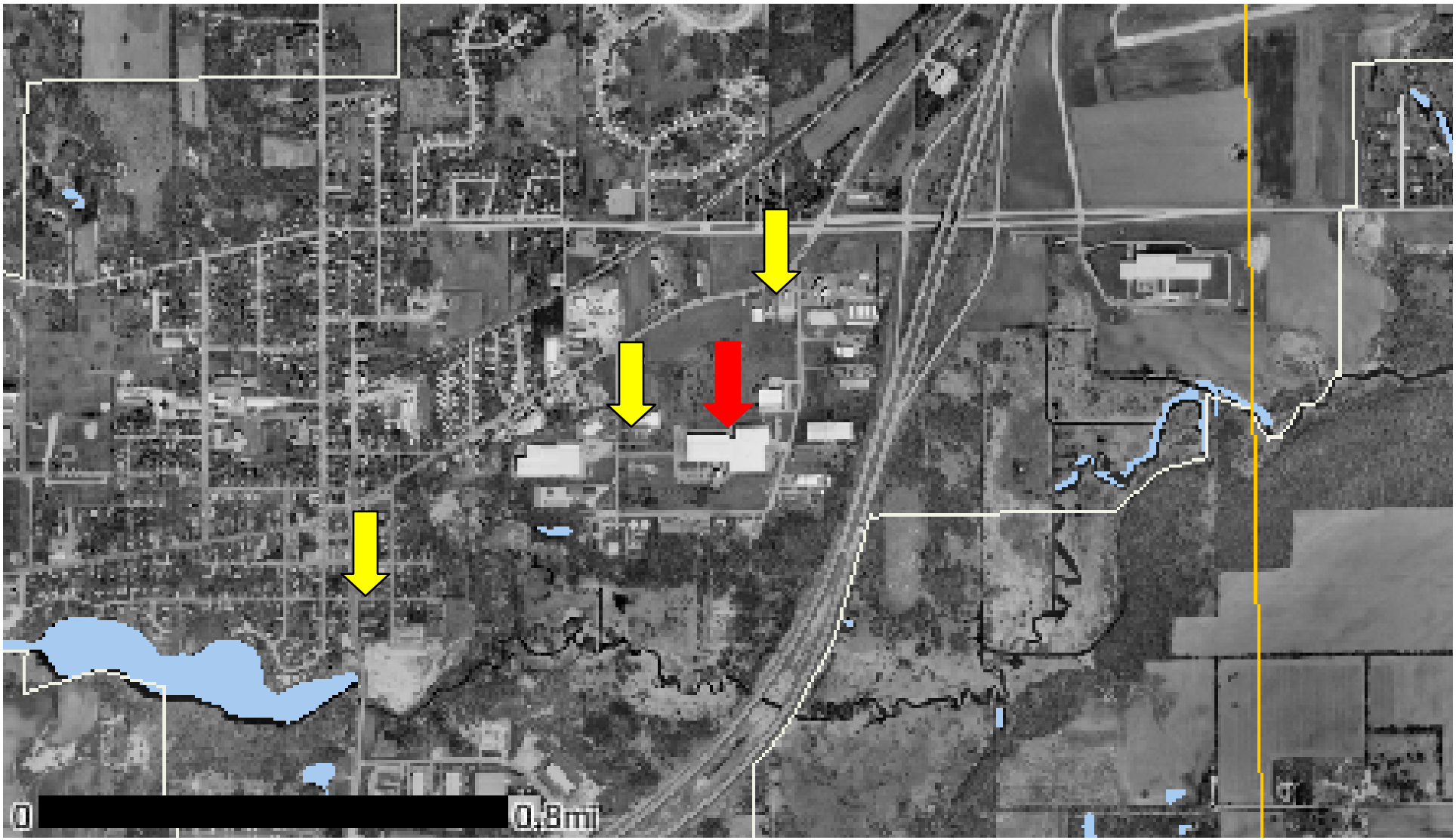
Modeling → Confirmation

Steel tubing is cleaned in TCE: 111.4 tons/year emitted to air

Plant in compliance with existing DNR air permit; regulatory authority is limited.

Plant 3

Air sample locations



Can Health Data be Helpful?

- Predicted chronic, low-level exposure.
- Rates of TCE-related cancers in East Troy compared to 3 statistically-matched zip codes and to statewide data.
- Rates of lymphoma, leukemia, liver cancer, and kidney cancer in East Troy are *statistically the same as three similar communities and the rest of the state.*

Do field measurements support modeled predictions in East Troy?

Comparison of air dispersion model predictions for trichloroethylene (TCE) near plant
TCE - Oct. 11, 2005

	Trichloroethylene concentration, using various estimates (ppbv)			Comparison value, ppbv
Location/approx. distance from Trent Tube plant 3	**Air dispersion Model**	**SUMMA samples (n=1)**	**Portable GC (n=1)**	
2011 Young St./1300 feet	93*	33	78	Carcinogenic effects: 0.0003 ppbv (1.6 ng/m^3), ref: EPA RIII risk-based concentration table, Non-cancer effects: 7.5 ppbv (40 ug/m3) ref: EPA draft risk assessment for TCE.
Child care parking lot/830feet	75*	<	trace	
2188 Church St./4300 feet	0.9**	<	trace	
Nearest residence/1400 feet	5.0**	Not sampled	Not sampled	Intermediate MRL (ATSDR):100 ppbv 2000 ppbv ATSDR acute MRL.

Recommendations

- **Indeterminate public health hazard** from inhalation of TCE in air in community.
- More air sampling needed at sensitive areas.
- Agencies should develop an integrated plan to communicate the environmental health implications of air quality studies for local community.
- Follow-up air sampling and air modeling in community to evaluate the effectiveness of efforts to reduce TCE emissions from plant.
- New model developed for supporting voluntary steps to reduce emissions.

Outcomes

- Plant management motivated to install water-based degreaser system.
  - Accelerated timetable and support from corporation
  - Changeover completed in early 2007
- Response from plant represents “model” regulatory-RP cooperation.
- Planning for similar proactive efforts elsewhere in WI

Conclusions

- Hazard surveillance tools can help bring about environmental public health improvements
- Regulatory authority may not be necessary
- Strong relationships between environmental and health agencies help
- Nobody wants to be the “big red spot” on the map

Next?