

# Perspectives on New Collaborative Areas

October 22, 2008

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**NCAR**

# A Strategic Topic of Major Importance to NCAR's future

- What is the scope of our future research, facilities and service domain?
  - The atmospheric and related sciences, or
  - The full spectrum of environmental sciences and a broadening element of earth-related sciences, or
  - The full spectrum of environmental sciences and relevant social sciences and decision-sciences



# The Polarity of Opinions (both are true)

The problems in the atmospheric and related sciences are significant and engaging, more than worthy of a national center that continues to be highly focused

vs.

The problems we face are multi-faceted (understanding weather and climate is only one intersecting component) and the future will be even more deeply tied to gaining a full environmental understanding and connecting it to societal benefit



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# Add a dose of reality

- We are in a **budget constrained environment** and this may last for a significant period
- There is **no federal funding agency that effectively enables the cross-over** of the physical sciences much less the physical and social sciences
- Our **constituency is a clearly defined set of disciplines**
- So, without multiple changes in external boundary conditions (budget, agency approach to multiple disciplines, constituency), **an internal decision to expand our domain can only occur by deletion** (and negative impacts on constituents) or a different approach

# A second dose of reality

- Our mission is predicated on an approach that is ***“beyond those that can properly be made available at individual universities”***
- So, when does the expertise that we might add in social sciences and decision-making (and many other sciences) exceed this threshold?



# The Challenge is Clear

- How do we reasonably reach for the future that everyone knows is going to happen?
  - Without investment in other disciplines from our ATM base
  - Without agencies that enable the cross-over of the relevant disciplines
  - Without the foundation of matching underlying constituents
  - Without exceeding the mission mandate of NCAR



# (?)New Collaborations that directly intersect our mission

- **Where is our mission most obvious?**
  - Large community models
  - Key facilities (computers, airplanes, radars, etc)
- **What capabilities are most needed in our intersection with other disciplines?**
  - Prediction – the discipline of forecasting – an ability to anticipate the future.

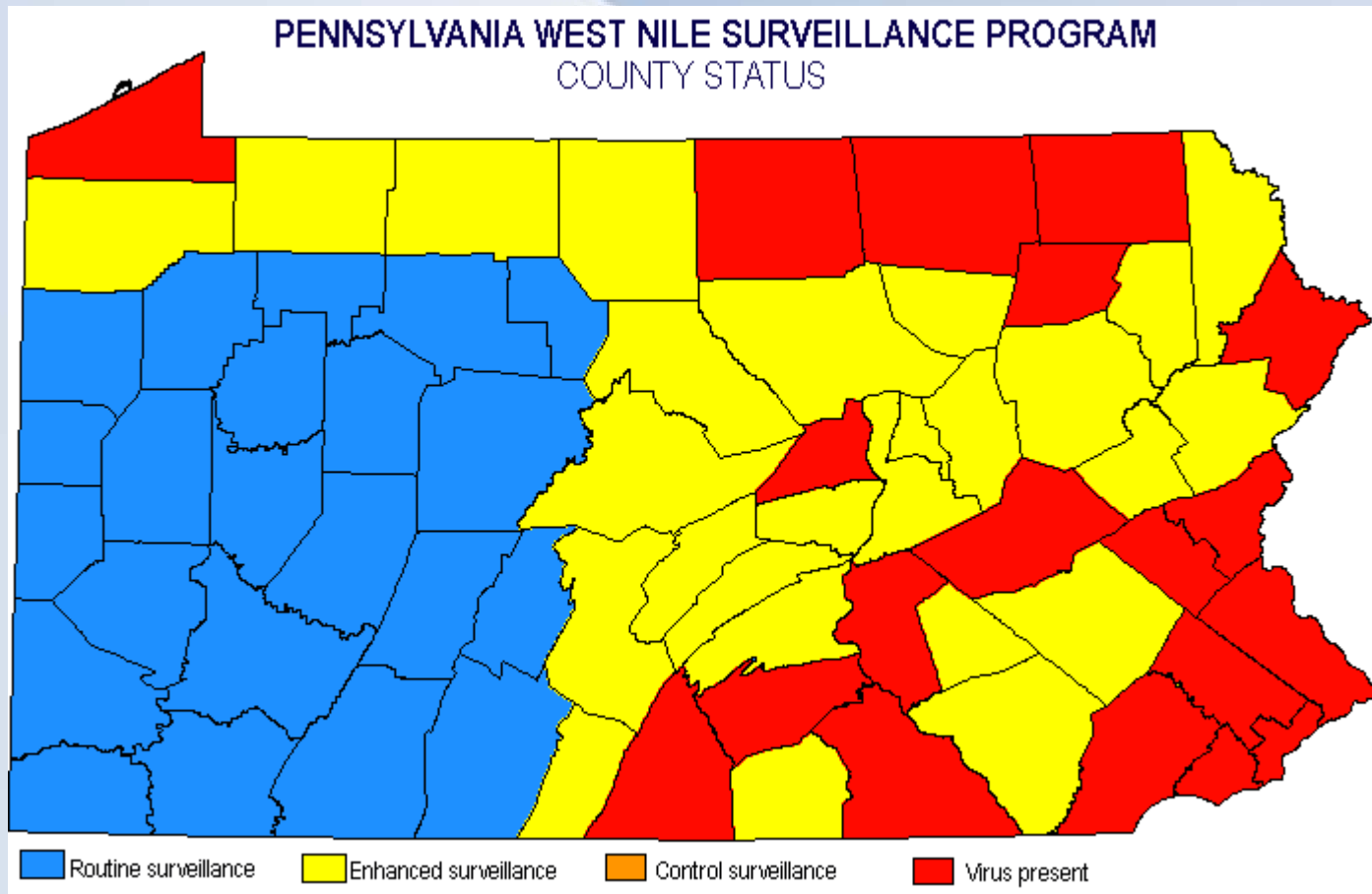


# An Example

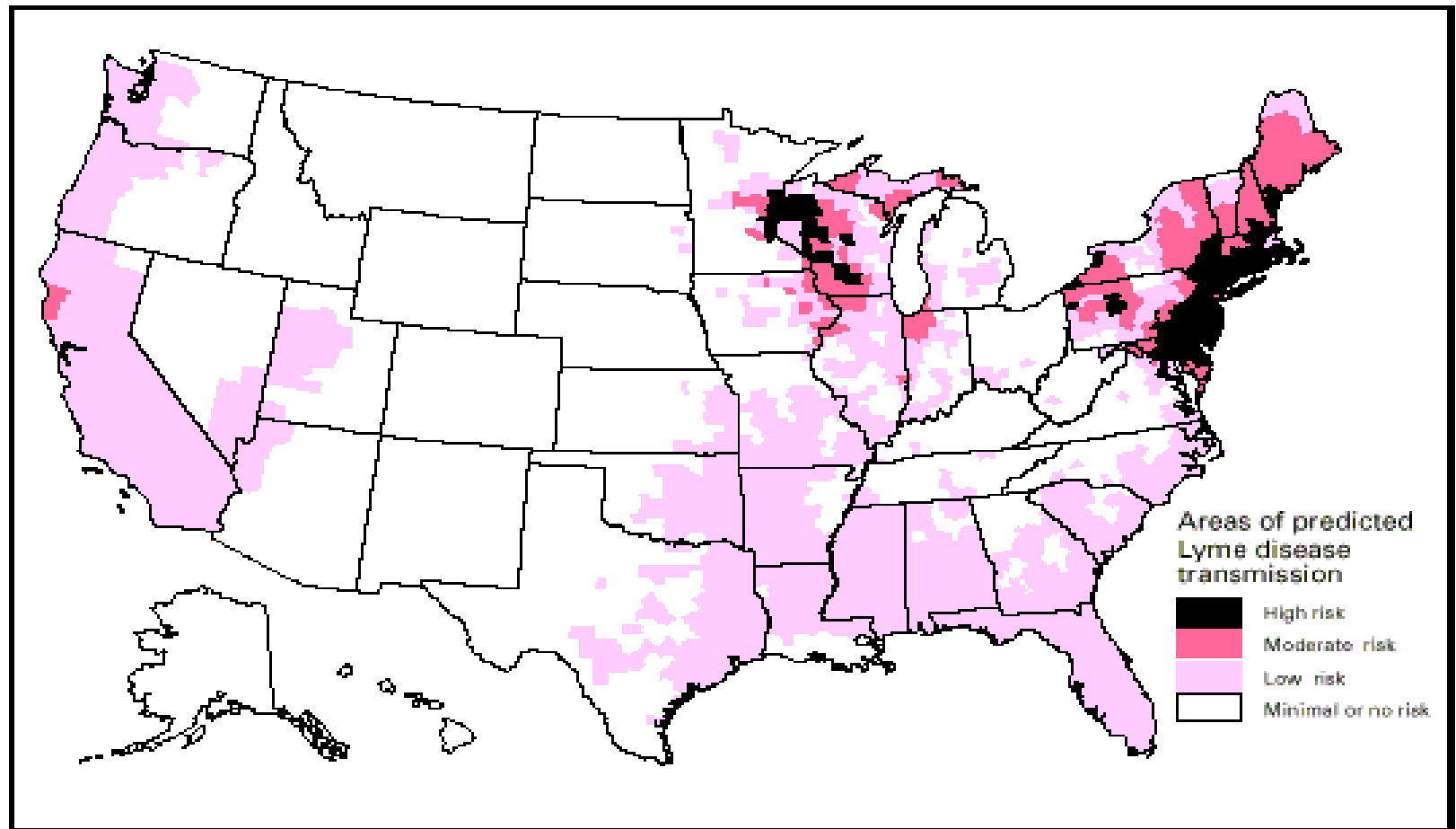
- Human Health
  - Clear tie to weather and climate
    - Distribution and timing of vectors, “over-wintering” (e.g. mosquitoes), incubation periods, availability of hosts, food availability for hosts, contact with human populations, etc.
    - Heat waves, air pollution, etc.
  - Medical response is “point of service” – reacts to incoming cases (almost no discipline of forecasting)
  - Therefore, real potential if we can design monitoring algorithms or predictive capability



# Example: Response based on Occurrence

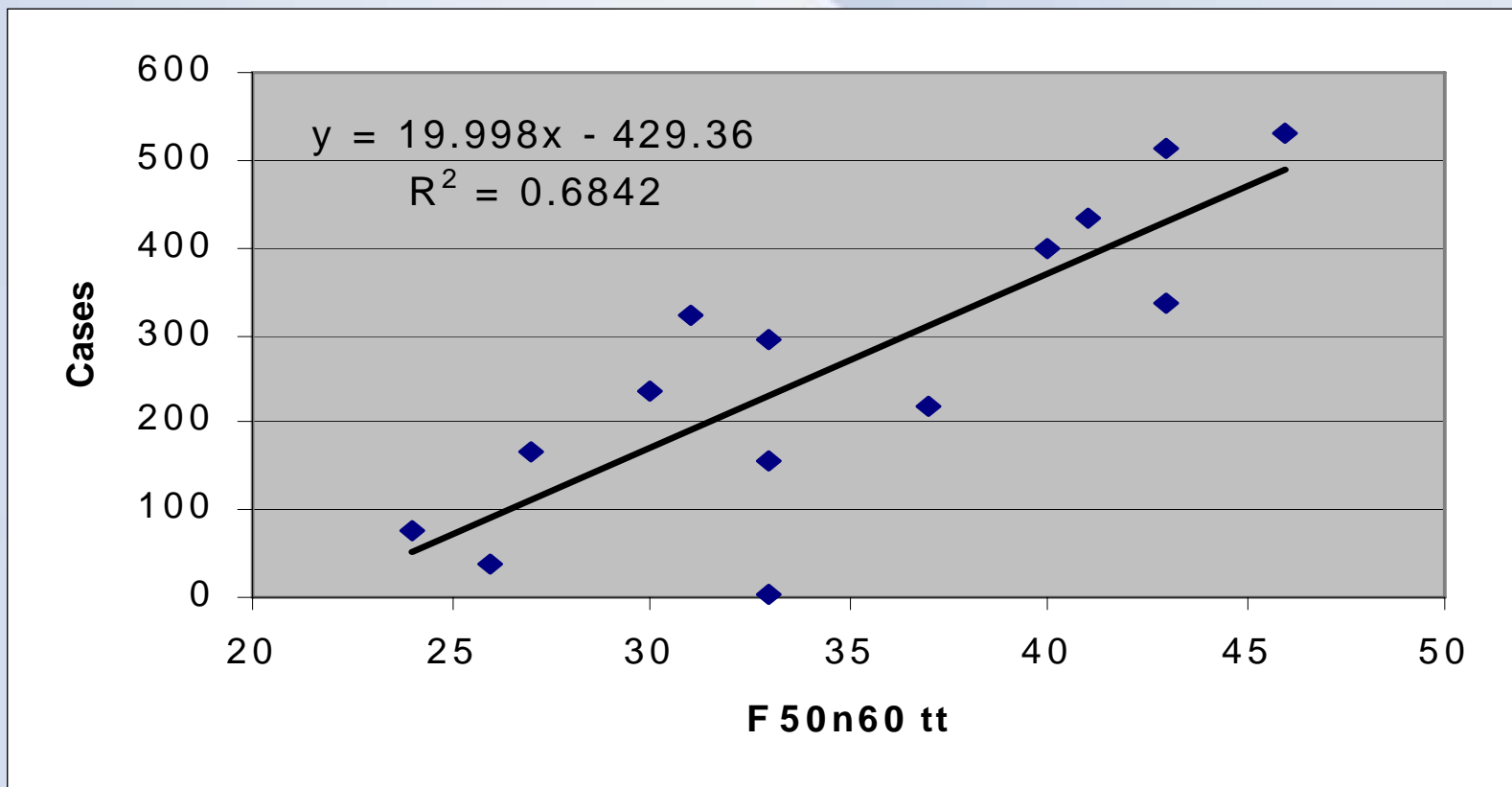


## National Lyme disease risk map with four categories of risk



Center for Disease Control and Prevention

Potential to Forecast – PA county correlation between Lyme Disease cases and warm days in fall from the prior year (also correlates with fall snow cover in the prior year)



# Compelling Problem of major significance

- Is our ability to predict adverse human health outcomes at the stage of weather forecasting in the 50's?
- Imagine the impact on society if we could anticipate adverse health outcomes and mitigate them
- Added benefit – more capable assessments of human health changes associated with climate change



# The Role of NCAR

- **Option A:** Add human health specialists and expand our domain
- **Option B:** Work in the “weather and climate services” framework – focus on providing our data and model output to a key, identified user (the health community) in a utilizable format
- **Option C:** Deliberately define new partnerships (NIH, NCAR-NSF, Universities) to create an independent focus on (Center?) Health and the Environment



# Option C: NIH, NCAR-NSF, University Partnership

- **Objective** – bring the discipline of forecasting to the health community
- **Mechanism** – create an intersection between NCAR/community climate and weather forecasting and prediction capabilities and the health community
- **Funding** - Seek NIH, perhaps EPA, funding
- **Expertise** - Health expertise (and center) not at NCAR – NCAR/community is key collaborator

# Bottom Line

- Capture the “future” by using our mission to enable other disciplines through deliberate partnerships
- Our internal growth has a clearer litmus test based on the level of connection to our mission
- Health is just one example.

Does it address the realities while still enabling the future that we know we must address?

