

Wisconsin's Citizen-based Stream Monitoring Program



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Wisconsin Lakes Convention
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Citizen-based Water Monitoring Network

- ❑ Goal: To help preserve and protect Wisconsin's over 15,000 lakes and 86,000 miles of rivers
- ❑ To accomplish:
 - First understand how they function
 - Then take note of their status
- ❑ Network offers citizens multiple opportunities to be part of this learning and monitoring process



Photos: Kris Stepenuck



Photo: Suzanne Wade

Citizen-based Water Monitoring Network

- Includes lakes, streams, wetlands, groundwater, etc.



<http://watermonitoring.uwex.edu/>

Volunteer Stream Monitoring Program

- ❑ Introduce citizens to the basics of monitoring through hands-on participation, and
- ❑ Educate about the connection between land use and the resulting effects on water quality
- ❑ Water Action Volunteers (WAV)

Water Action Volunteers



How the Program Began

- ❑ Successful lakes program since 1980s. Why not streams?
- ❑ Mid-1990s survey
 - Many groups, but uncoordinated
- ❑ Online data sharing an option – *if* methods unified
- ❑ 1996-7 developed **educational** program with five parameters
 - Easy to measure
 - Well-represented stream health over time



Macroinvertebrate collection















Then in 2004...

□ WDNR administration said:

“We need help collecting data for
management purposes.

Grow the program!”

“Start yesterday.”



Multiple Levels

- ❑ Program offers citizens multiple opportunities to be part of learning and monitoring process
- ❑ Three-levels
 - Accommodate varied interests & time availability of citizens
 - Can assess interest with less \$/time commitment (on part of volunteers *and* coordinators) and build from there

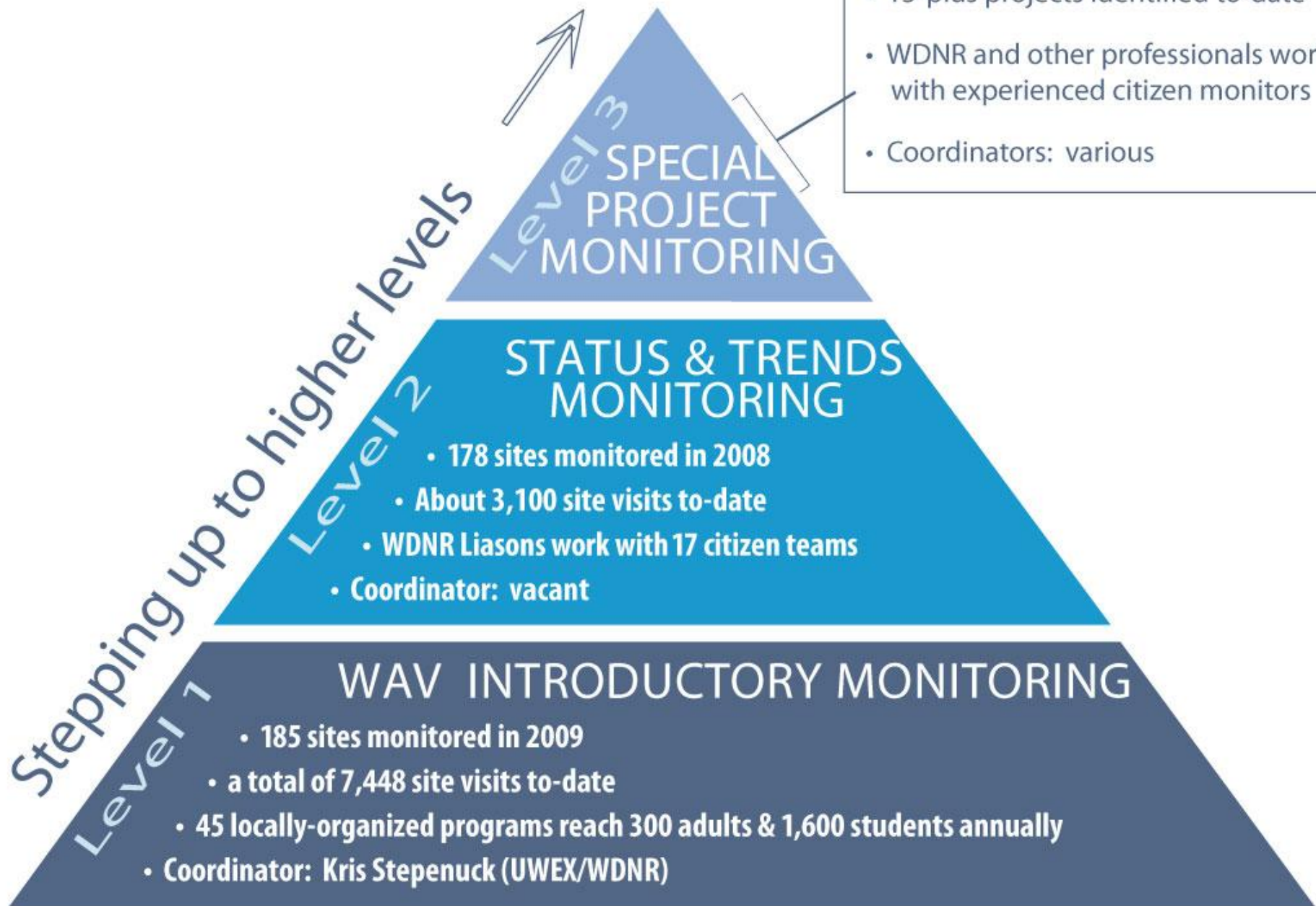




Multiple Levels



- ❑ Level 1 – original, educational program
 - Introduces citizens to monitoring basics
 - Educates about connection between land & water quality
- ❑ Level 2 – Status and trends
 - A more intensive monitoring experience
 - Must follow a specific schedule
 - Utilize DNR methodologies & databases
- ❑ Level 3 – Research projects
 - Unique opportunity to address a specific issue



Water Action Volunteers



- ❑ Train the Trainer model used
- ❑ Led locally by County staff, Nature Center staff, Interest groups, Teachers, etc.



Resources Available for Volunteers

- ❑ Program overview brochures
- ❑ Local coordinators
- ❑ Local trainings
- ❑ Written methods
- ❑ Level 1 DVD refresher training (also online)
- ❑ Equipment lending libraries
- ❑ Online access to submit data and view results
- ❑ New middle/high school curriculum
- ❑ Many website resources



Water Action Volunteers



- ❑ Database (<http://www.uwex.edu/erc/wavdb/>)
 - Can compare a site over time
 - Can compare between sites
 - Can download data to Excel for further analysis
 - Mapped data available too



Water Action Volunteers

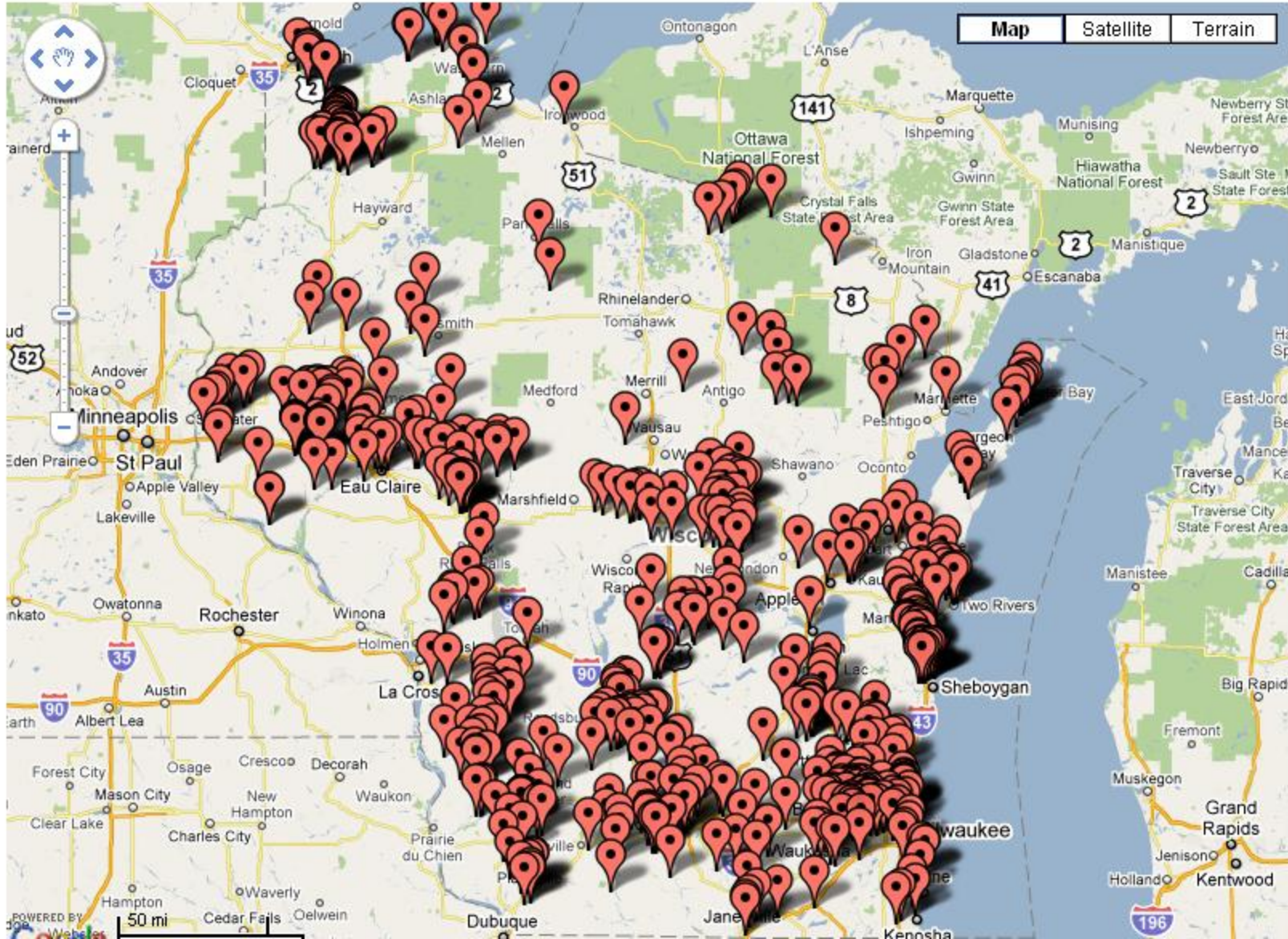


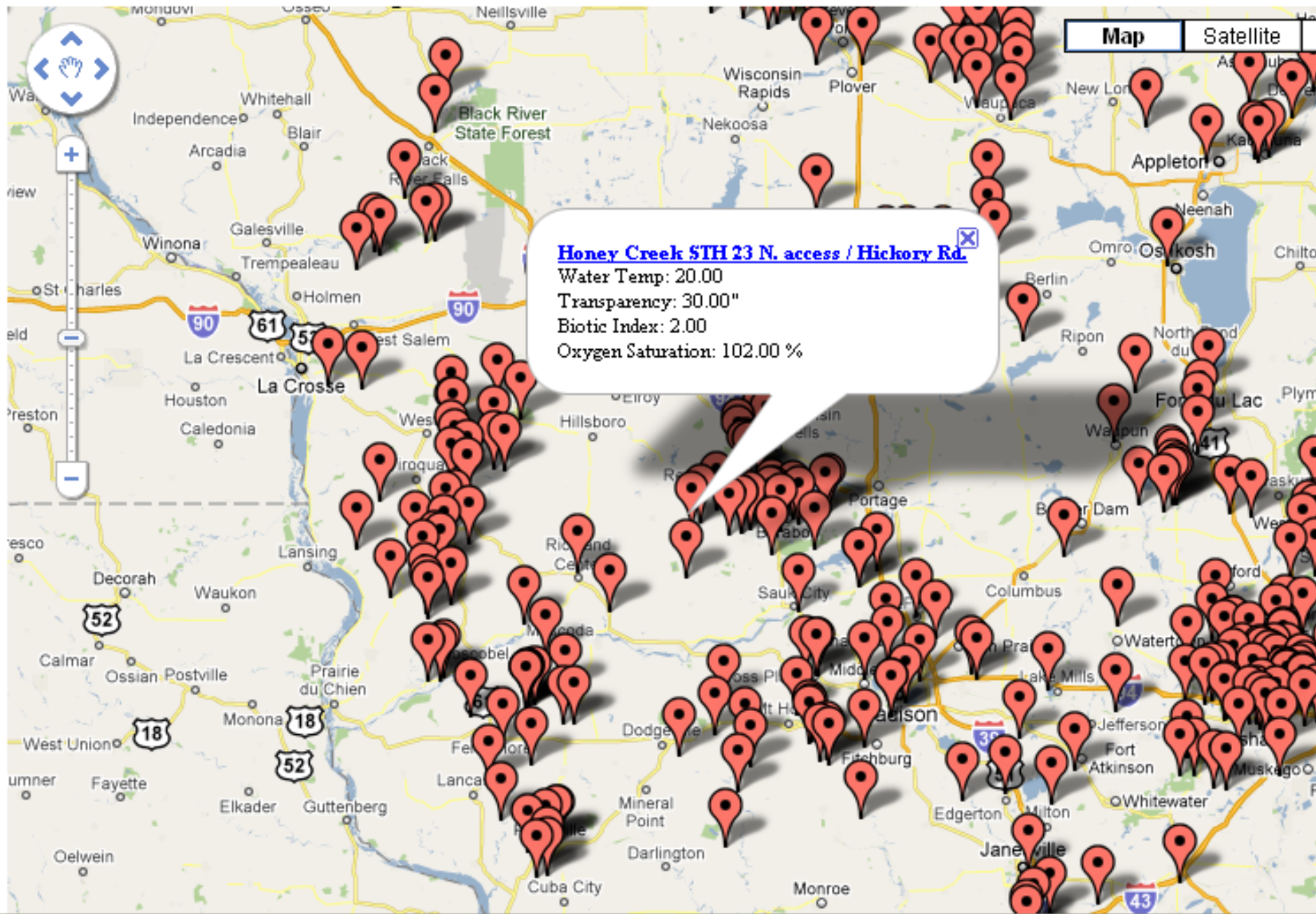
HOME

LOGIN

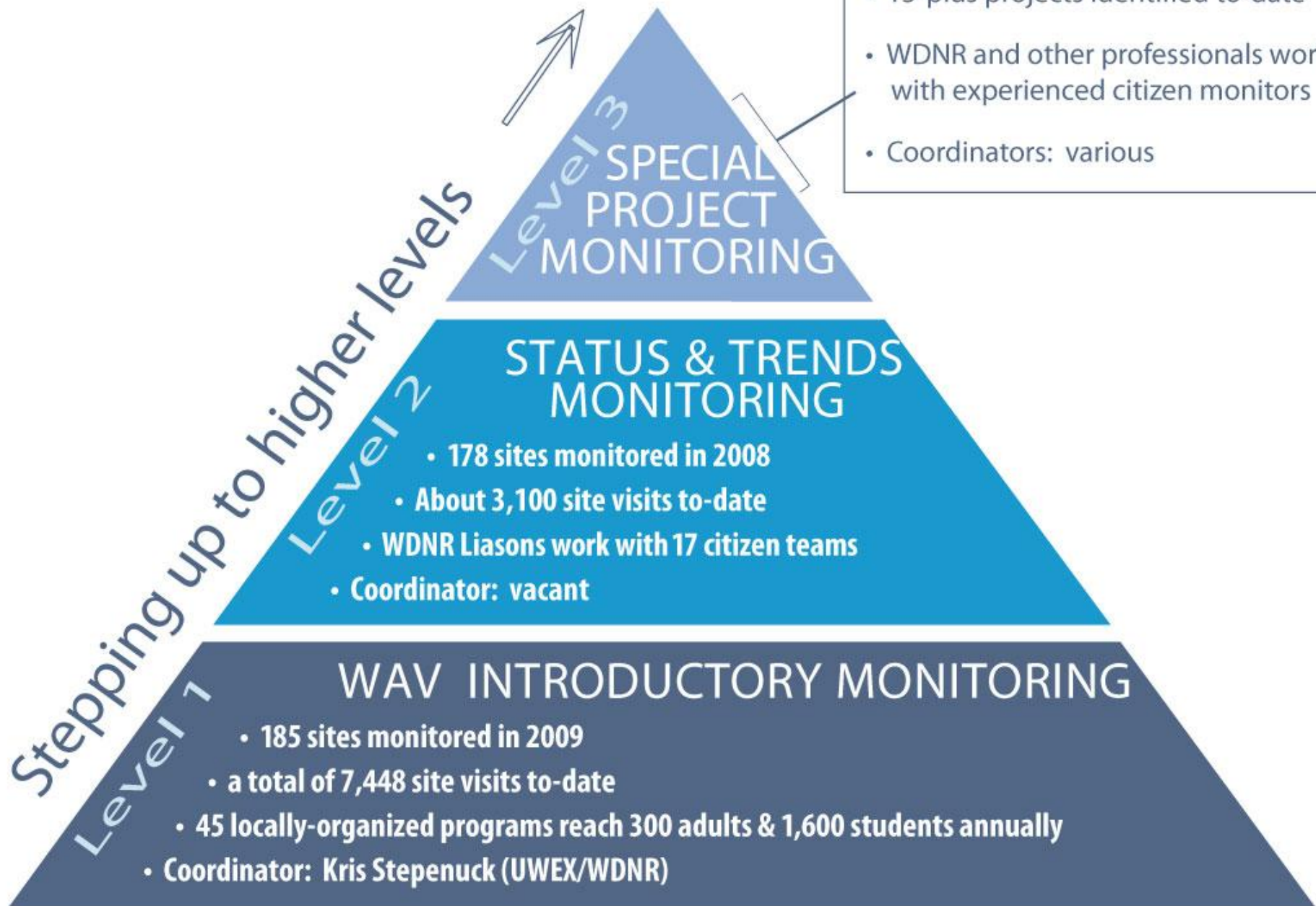
REGISTER

HELP





one



Level 2



- Data stored online (DNR-based database)
 - Automated data reports available by site and by WDNR Region



Level 2



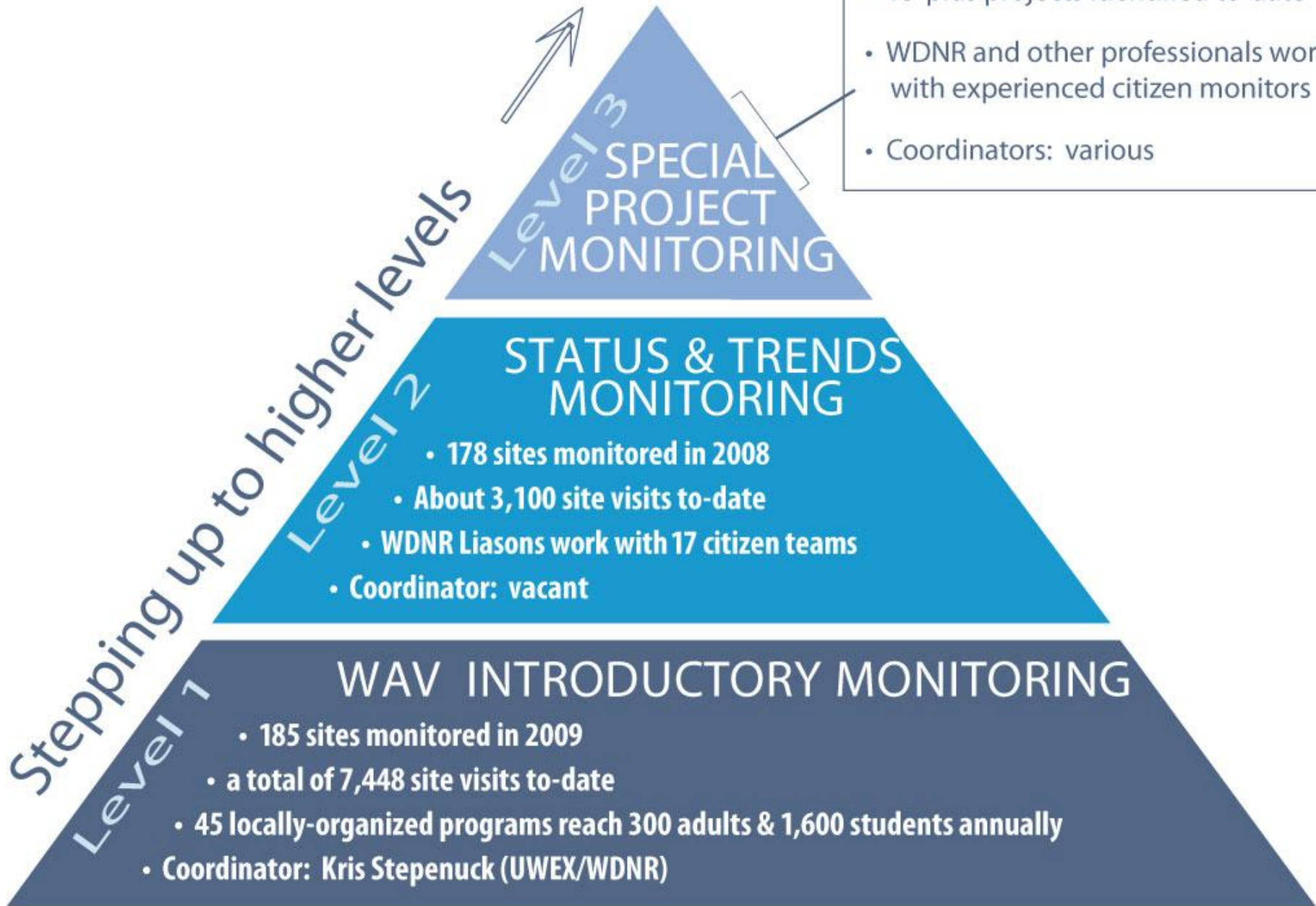
- ❑ Data used:
 - ❑ To assess streams for potential to support trout populations
 - ❑ To focus broader monitoring efforts in areas where anomalies were found
 - ⑩ To verify a new DNR model about stream temperature Annual statewide biologist surveys
 - ❑ For long-term trend assessments



Equipment Costs

- Level 1: ~\$250 per site
 - D-frame net (\$55)
 - Hach dissolved oxygen kit (\$70)
 - Transparency tube (\$52)
- Level 2: ~\$1750 per site
 - Transparency tube (\$52)
 - YSI dissolved oxygen meter (\$925)
 - Thermistors (\$130) (plus software)
 - pH meter (\$320)





Level 3



□ Special Projects

- Unique opportunity to address a specific water quality issue or concern
- Projects defined annually and involve a wide range of complexity, expense, and time commitment
- Citizens should have been involved in other levels of monitoring first (usually)
 - Saves costs, time, etc. due to low retention rates



Level 3



□ Examples

- Big Eau Pleine on impaired waters list for dissolved oxygen and pH
 - Monthly water quality samples collected
- Carpenter Creek on impaired waters list – monitored to verify delisting
- Odonata Atlas
- *E. coli* screening
- Wetland Monitoring



Level 3 – WI Ephemeral Ponds Project (WEPP)



- ❑ Citizens identify, inventory, and monitor the ecology of ephemeral ponds in SE WI
- ❑ Ephemeral ponds: depressional wetlands that temporarily hold water in the spring and early summer or after heavy rains
- ❑ <http://watermonitoring.uwex.edu/level3/WEPP/>



Photos: WEPP Program

Level 3: Marsh Monitoring Program

- ❑ Bird Studies Canada program
- ❑ Citizens monitor wetlands three nights each spring/early summer for frogs
- ❑ No training required



Photos: Kathy Jones

Contact Information

<http://watermonitoring.uwex.edu/index.html>

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Shoreland Life of Streams

- ❑ Dragonflies
- ❑ Among other places, live in vegetation along banks
- ❑ 1 to 4 year life cycle for this species, which emerges as...



Photo: Phil Emmling





Shoreland Life of Streams

- Damselflies
- Among other places, live in vegetation along banks
- “tails” increase their respiration by adding surface area.
- 1-2 years as larvae...They emerge as...



Photo: Phil Emmling



“Ebony jewelwing”, SBR Pike River near Amberg, WI

[flickr.com/photos/24608578@N00/3927990728](https://www.flickr.com/photos/24608578@N00/3927990728)



Shoreland Life of Streams

- ❑ Stoneflies
- ❑ Live in organic material in fast moving streams
- ❑ Feed on fallen leaves, so depend on riparian area being vegetated
- ❑ 3 years to emerge as adults



Photo: Phil Emmling



http://farm4.static.flickr.com/3265/2625771871_bde956c4f3.jpg?v=0

Shoreland Life of Streams

- ❑ Caddisflies
- ❑ Live in ponds, marshes and slow streams
- ❑ Some types feed on leaves and create cases of vegetation
- ❑ 1 year to emerge as adults



Photo: Phil Emmling





Shoreland Life of Streams

- ❑ Water Striders
- ❑ Live along edge of streams, ponds, wetlands
- ❑ Hide in leaves along shore for protection
- ❑ Adults over-winter in protected locations along shore
- ❑ Eggs laid at edge of water – just below surface on objects in water
- ❑ 1-3 generations per year



And many, many more...

- For more information about aquatic insects in streams, visit:

<http://watermonitoring.uwex.edu/wav/>
and follow these steps, choosing the following links:

1. Citizen Stream Monitoring
2. Resources for Coordinators
3. Macroinvertebrate Info

Upcoming events

- Ephemeral Pond Ecology & Monitoring Trainings
 - April 5, 10, 24
- Stream Monitoring Trainings
 - Saturdays, April 10-June 19, various locations statewide
- Teacher Trainings
 - Week of July 19 – central WI
 - August 18 – Mazomanie Science Outreach Outpost
- Family Level Macroinvertebrate ID Wksp
 - August 16-17, Trees for Tomorrow, Eagle River
- All posted at:
<http://watermonitoring.uwex.edu/wav/events.html>