

West Nile Virus (WNV) and Weather Related Tracking in Illinois: GIS Portal Development:  
Pilot Project

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## **INTRODUCTION/BACKGROUND**

The Association for State and Territorial Health Officials (ASTHO) serves as a voice for unfunded states to receive training in partnership with Centers for Disease Control and Prevention (CDC) National Environmental Public Health Tracking Network, through the Environmental Public Health Tracking Peer-to-Peer Fellowship Program.

In Fall 2012, Dhitinut Ratnapradipa, PhD, Associate Professor of Public Health Education at Southern Illinois University Carbondale (SIUC), became aware of the fellowship opportunity and contacted Linn Haramis, PhD, Entomologist/Vector Control Manager, Division of Environmental Health at the Illinois Department of Public Health (IDPH) in Springfield, Illinois. Dr. Haramis consulted with his colleagues at IDPH, and notified Dr. Ratnapradipa that IDPH did not plan to apply for the program due to personnel limitations. However, IDPH values collaborative relationships with other entities, and on October 26, 2012 IDPH Director LaMar Hasbrouck designated Dr. Ratnapradipa as IDPH's bona fide agent for this fellowship opportunity. Dr. Ratnapradipa submitted the fellowship application materials to ASTHO on November 2, 2012. On January 29, 2013, ASTHO awarded the 2013 Environmental Public Health Tracking Peer-to-Peer Fellowship Program to the State of Illinois, with Dr. Ratnapradipa as the designated bona fide agent. Dr. Ratnapradipa collaborated with Dr. Haramis at IDPH to obtain West Nile Virus data.

On February 26, 2013, Dr. Ratnapradipa was informed by Ify Mordi that the ASTHO-CDC Review Panel had selected South Carolina as the mentor state.

## **TRACKING FELLOWSHIP ACTIVITIES**

### **ESRI online training**

On February 20, 2013, Dr. Ratnapradipa participated in an online training for the 2013 Fellows. The first portion of the workshop, "CDC's Environmental Public Health Tracking Program Update," was presented by Shannon DeWitt, Security Steward/Development Public Portal at the Environmental Health Tracking Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health at the CDC. The presentation highlighted new additions to the network, including toolkits with communication tools, climate data, and health effects from a variety of hazards.

The second portion of the training was presented by Tanuka Bhowmick of Esri entitled "Data Visualization Training for Tracking." Esri is a global leader in geographic information systems (GIS), combining maps and analytical data to convey critical information. The presentation provided an overview of the ArcGIS system, map packages available, and data sharing options. A list of useful resources was also provided. Copies of PowerPoints from both presentations were made available to Fellows following the training.

## Site Visit to Mentor State

A pre-site visit conference call was held on Friday, March 22, 2013 with representatives from ASTHO (Ify Mordi, Senior Public Health Analyst), the South Carolina Department of Health and Environmental Control (SC DHEC) (Fran Marshall, State Toxicologist & EHPT Program Manager), and the Illinois Fellow (Dhitinut Ratnapradipa). The call discussed the Illinois project proposal, the site visit agenda, and potential site visit dates.

Dr. Ratnapradipa arrived in South Carolina late on April 14<sup>th</sup>, and the visit to SC DHEC was conducted April 15-16, 2013. IDPH was unable to send a representative. The full agenda for the 2-day visit was sent prior to the visit, as were copies of the visit expectations. The main contact in SC was Fran Marshall, State Toxicologist and SC EPHT Program Manager. SC DEHC is located in Columbia, only a few blocks from the University of South Carolina (USC). DEHC enjoys a collaborative relationship with the USC Arnold School of Public Health.

The fellow's learning objectives for the site visit were:

- To better understand the steps involved in developing and maintaining a portal (technical aspects of how to set it up)
- To gain a better understanding of how to utilize existing climate data (temperature and precipitation)
- How to superimpose weather data with incidence rates (WNV positive for human cases; also would like to track animal positive tests as indicators of "hot spots" of activity)
- How specific can the maps be while protecting privacy?
- Can the maps be set up to show changes over time (like a radar sweep covering daily changes to temp and precipitation patterns with WNV cases superimposed)
- Marketing and educational outreach (risk communication)

Day 1 began with an introduction to the SC tracking program staff. The agenda covered:

- Introductions
- Building partnerships
- Information technology
- Web portal demonstration

The staff provided an overview of tracking in SC, including: development, funding, capacity-building, staffing, network organization, and data priority areas. The SC tracking program is well-developed, and supported at multiple levels within the organizational structure. The data sharing agreements are essential to the ability of the state to integrate a variety of data sources into its tracking program. Day 1 also provided an overview of how SC uses the GIS applications to share data, and provided a demonstration of web portal development and management. Dr. Ratnapradipa provided an overview of the Illinois pilot project and received tips and suggestions about how to get started with portal development.

Day 2 agenda:

- Data collection and management, including privacy issues
- Risk communication
- Outreach
- Question and Answer/Wrap up

Information was tailored for application to West Nile Virus, the focus of the Illinois pilot project. Discussion of data management and privacy issues were very helpful.

Overall, the site visit was well-planned, informative, and helpful. SC DHEC staff tailored their presentations to address the specific learning objectives for the Illinois project related to WNV and climate change factors, as well as some of the challenges involved in integrating those types of data. SC DHEC also expressed a willingness to answer any additional questions and to continue to serve in a mentoring capacity after the site visit was ended.

### **EPHT Tracking Workshop**

The conference was held in Atlanta, GA August 27, 2013. Unfortunately, Dr. Ratnapradipa had a scheduling conflict with an international conference and was unable to attend. IDPH was also unable to send a designee.

### **PILOT PROJECT**

#### Project Summary

In 2012, West Nile Virus (WNV) reached epidemic proportions in the southern United States, including Illinois. WNV is a flavivirus spread by the *Culex* mosquito. Currently, the Illinois Department of Public Health (IDPH) monitors WNV related to epidemiological and ecological data. Those activities include monitoring human infected cases, mortality cases, positive bird, positive horse, etc, with results aggregated and reported at the municipality and county levels. IDPH routinely updates reporting on its website during the active mosquito season (typically each Wednesday June through October). The goal of this project was to enhance the understanding of the role of collected WNV data and examining the connection to weather data, as well as to enhance the ability of IDPH to participate in national EPHT initiatives.

#### Specific Aim

To integrate data in the process of portal development, with the intention of enhancing the IDPH web page(s) reporting WNV information.

#### Research Design, Methods, and Key Personnel

This project was conducted by Dr. Ratnapradipa, bona fide agent representing the Illinois Department of Public Health. Dr. Haramis, Entomologist/Vector Control Manager, Division of

Environmental Health at IDPH provided the WNV data reported to the state in 2012. Weather data for the State of Illinois (reported at the county level) for 2012 was obtained from the National Weather Service at the National Oceanic and Atmospheric Administration (NOAA). Weather data included daily high and low temperatures and precipitation amounts.

West Nile Virus disease is considered notifiable, meaning that medical professionals/health care providers are required to notify IDPH when human cases are confirmed. Although data reports include detailed information about location, IDPH personnel aggregate that data to protect individual privacy, and report the aggregate data publicly on its website. Animal cases are also reported by county, but clicking on the county will show specific municipality data and date.

### Results

IDPH hosts an informational website (<http://www.idph.state.il.us/envhealth/wnv.htm>) with information about WNV. The site has a sidebar menu with surveillance information by year, which leads to pages with additional links. The webpage with data for human cases includes a map of Illinois indicating any positive case on a county basis, with tables further breaking down the information. Similarly, the webpage with data for animal cases shows a map of Illinois with positive cases by county and tables to provide additional information. To date, weather information has not been integrated onto the existing sites.

### Discussion

SC DHEC personnel were very helpful in providing assistance with the initial stages of designing an interactive web portal, but the logistics of creating a more interactive GIS map proved more difficult than anticipated. Although it was possible to obtain the WNV data and the weather data, several organizational issues were hurdles to full implementation of the proposed pilot project. Utilization of GIS technology to update IDPH public web pages requires implementation through the Illinois Department of Central Management Services Enterprise IT Governance Process as well as an internal IDPH review. The length of time required to complete these comprehensive review and implementation processes was not completely considered at the outset of the project.

### Future Activities

The fellow will continue to collaborate with IDPH personnel in the Division of Environmental Health to seek opportunities to enhance the tracking and reporting capabilities.

### **CONCLUSION**

This project provided unique learning opportunities for the fellow. The peer-to-peer mentoring by personnel in another state is an invaluable aspect of the fellowship program. Although time and budget constraints limited the implementation of the pilot project, the process of integrating data and attempting to convey it in more interactive ways.