

Doing More with Less: Mosquito Surveillance and Response Planning in a Resource-Scarce State

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WELCOME TO MAINE

Memories to last a lifetime

Maine Arbovirus Timeline

2005

EEE found
in 2 horses,
12 birds
from S. ME

2009

cervid
serosurvey
initiated

2001

1st EEE and
WNV finds
(birds)

1999

WNV
in NY

2002

Mosquito
trapping in
proximity to
EEE or WNV-
infected birds

2009

EEE found in 15
horses, 1 llama in
Central ME. 3
pheasant flocks, 1
mosquito pool EEE in
S. ME



2010

Weekly
mosquito
trapping
shifted to
EEE, 22 sites

2013

EEE in 2
horses, 12
birds from S.
ME

2014

1st
human
EEE case

2015

2nd Human
WNV case.
1st human
EEE death.

2012

1st human WNV in
ME.
VT: 2 human **EEE**
deaths. VT conducts
aerial application.

LD 1808

authorizes govt
entities to
control
mosquitoes if
public health
threatened

Plan and MOU Formalizes Cooperation between State Health and Agriculture Departments



**State of Maine Department of Agriculture,
Conservation and Forestry**

Plan to Protect the Public Health from Mosquito-Borne Diseases

Pursuant to Resolve 2013, Chapter 13

**Presented by the Maine Department of Agriculture,
Conservation and Forestry in Cooperation with the Maine
Department of Health and Human Services**

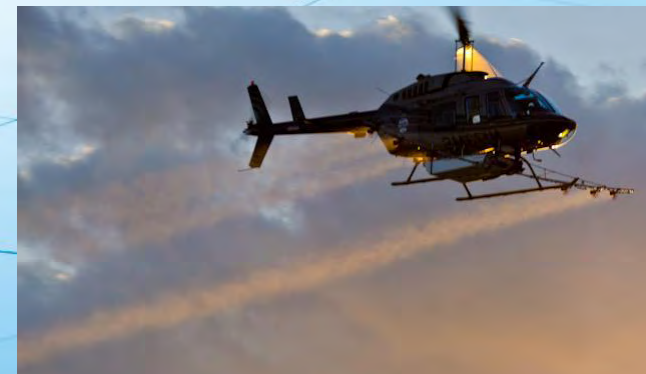
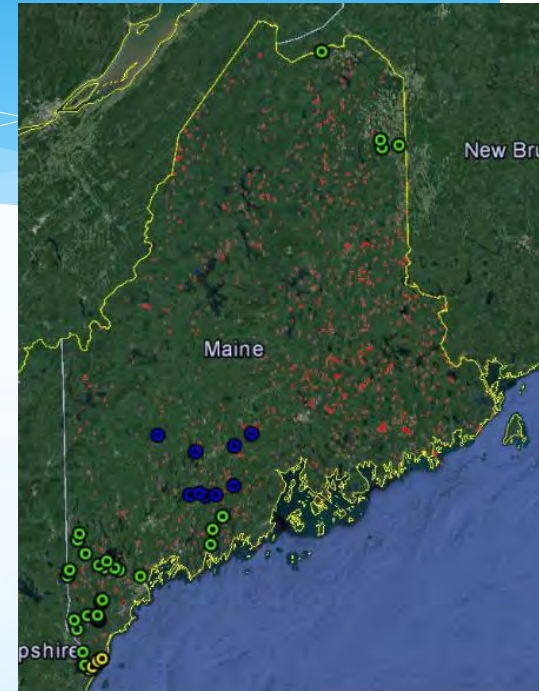
2014. Amended 2015.

Memorandum of Understanding
Between
Maine Center for Disease Control and Prevention (Maine CDC),
Department of Health and Human Services,
And
Board of Pesticides Control,
Department of Agriculture, Conservation and Forestry

*Thinkfirstspraylast.org (search for
'mosquito plan')*

Support Mosquito Surveillance and Management within Existing Resources

- * Build State-agency capacity for surveillance
- * Develop GIS system to identify optimal mosquito surveillance sites
 - * Evaluate current 'long-term' sites
 - * Identify new sites for rapid response and expanded surveillance
- * Plan Mosquito Management Action
 - * Identify potential treatment areas
 - * Identify exclusion zones (eg organic farms)



BPC 3000 Skeeter Vac





2016
Weekly
monitoring
at 8 resting
box sites.
Light traps
at 2 sites





Mosquitoes identified.
Target species transported
to Health Lab for testing.

Mosquito Habitat Mapping Project

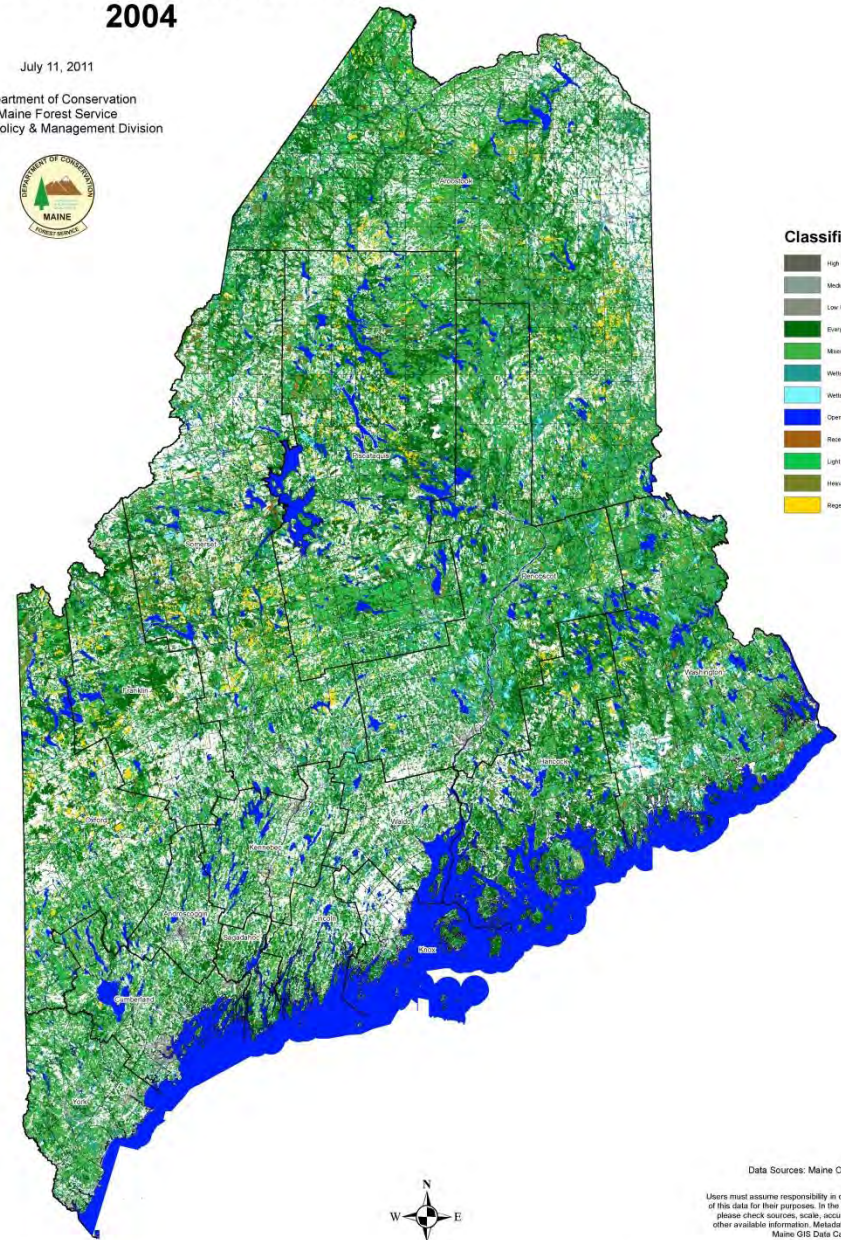


Megan Patterson, ME Board of Pesticides Control, Dept of Agriculture, Conservation, Forestry

Landcover Classification Map 2004

July 11, 2011

Department of Conservation
Maine Forest Service
Forest Policy & Management Division



Classification

- High Intensity Developed
- Medium Intensity Developed
- Low Intensity Developed
- Evergreen Forest
- Mixed Forest
- Wetland Forest
- Wetlands
- Open Water
- Recent Clearcut
- Light Partial Cut
- Heavy Partial Cut
- Regenerating Forest

Data Sources: Maine Office of GIS

Users must assume responsibility in determining the usability of this data for their purposes. In the use of Maine GIS data, please check sources, scale, accuracy, currentness and other available information. Metadata is available from the Maine GIS Data Catalog.



200 100 0 Miles

G:\Maine\maine2004\maincov_w\maincov_04.mxd

Maine Landcover Dataset (2004)

- * Wetland Forest
- * Mixed Forest
- * Evergreen Forest
- * Wetlands

National Wetland Inventory (2013)

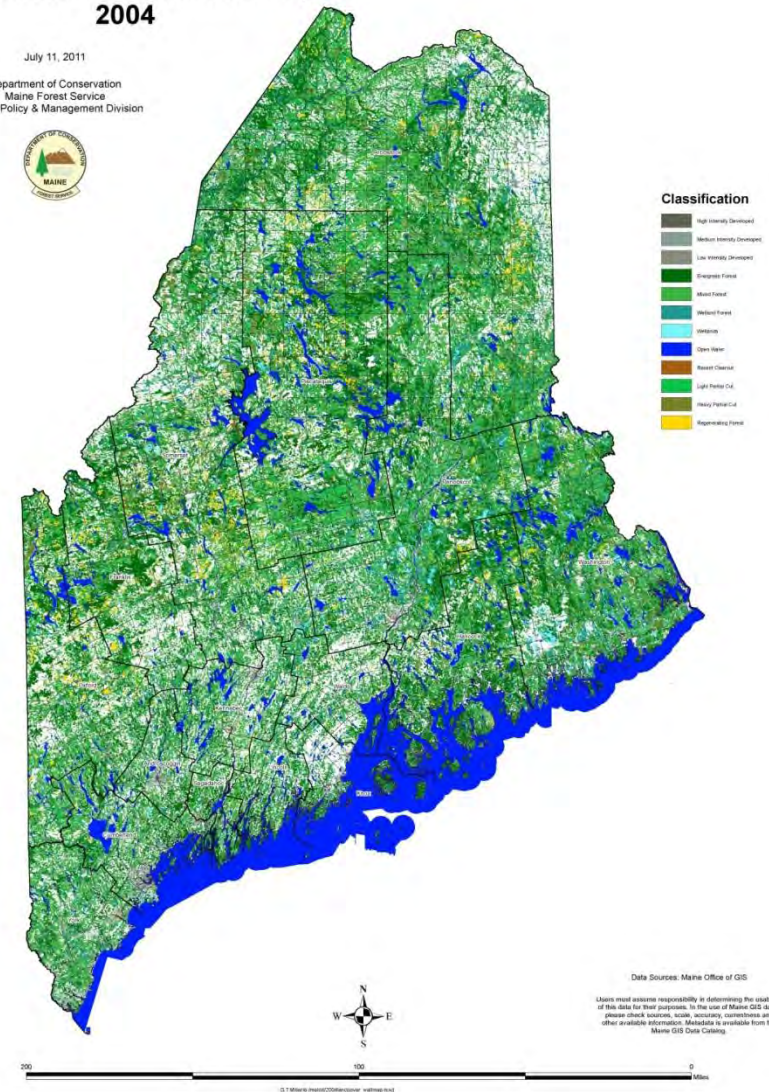
- * Palustrine habitat (Scrub-shrub wetland—broadleaved deciduous)
- * Forested wetland—needle-leaved evergreen
- * Forested wetland—broad-leaved deciduous
- * And more

Landcover Classification Map

2004

July 11, 2011

Department of Conservation
Maine Forest Service
Forest Policy & Management Division



Classification

- High Intensity Development
- Medium Intensity Development
- Low Intensity Development
- Emergent Forest
- Mixed Forest
- Wetland Forest
- Wetland
- Open Water
- Forest Clearance
- Light Pasture/Cropland
- Heavy Pasture/Cropland
- Riparian Forest

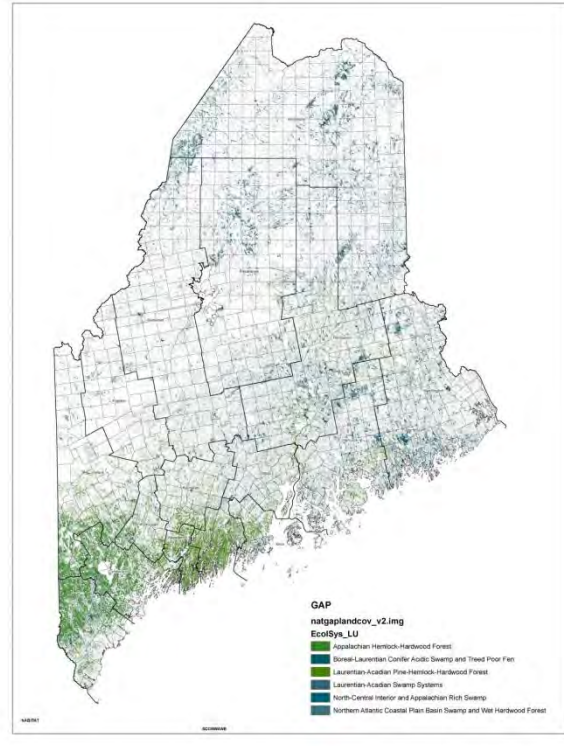
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USGS Gap Analysis Land Cover Data

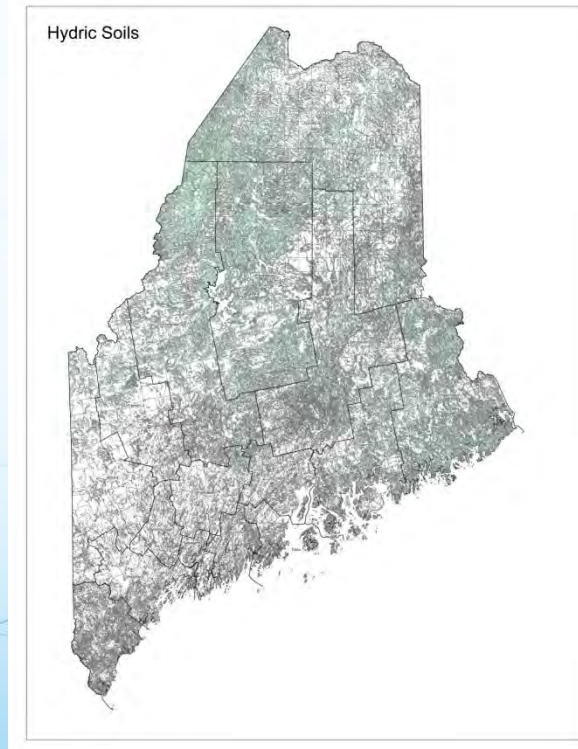
Forested wetland
and upland habitat
adjacent to a
wetland.

- Boreal-Laurentian
Conifer Acidic
Swamp
- Laurentian-
Acadian Pine-
Hemlock
Hardwood
- And more



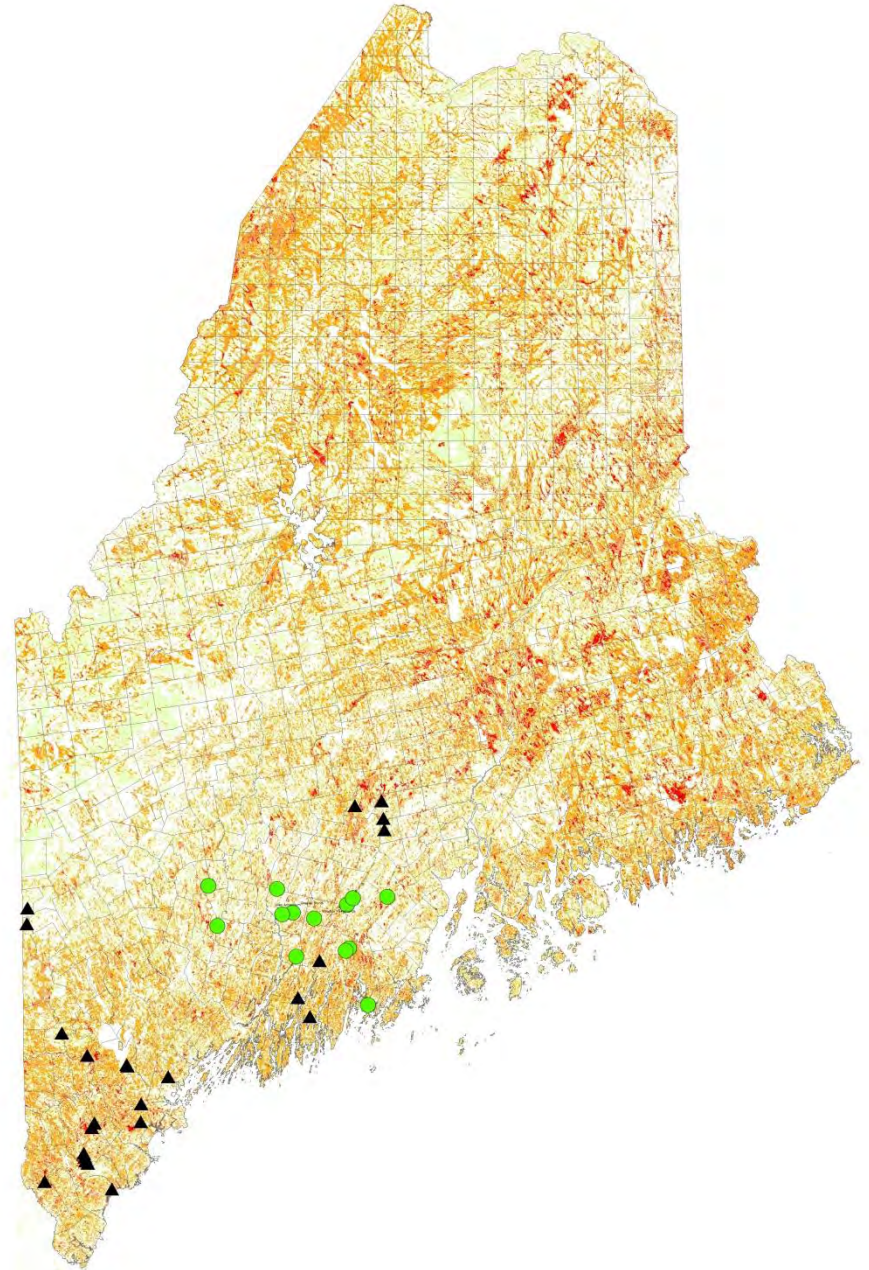
USDA NRCS Soils Data

- Hydric Soils



Simple Addition

- * Converted polygon (vector data) to raster
- * Raster layers reclassified
 - * 1=data present
 - * 0=not present
- * Overlaps were additive

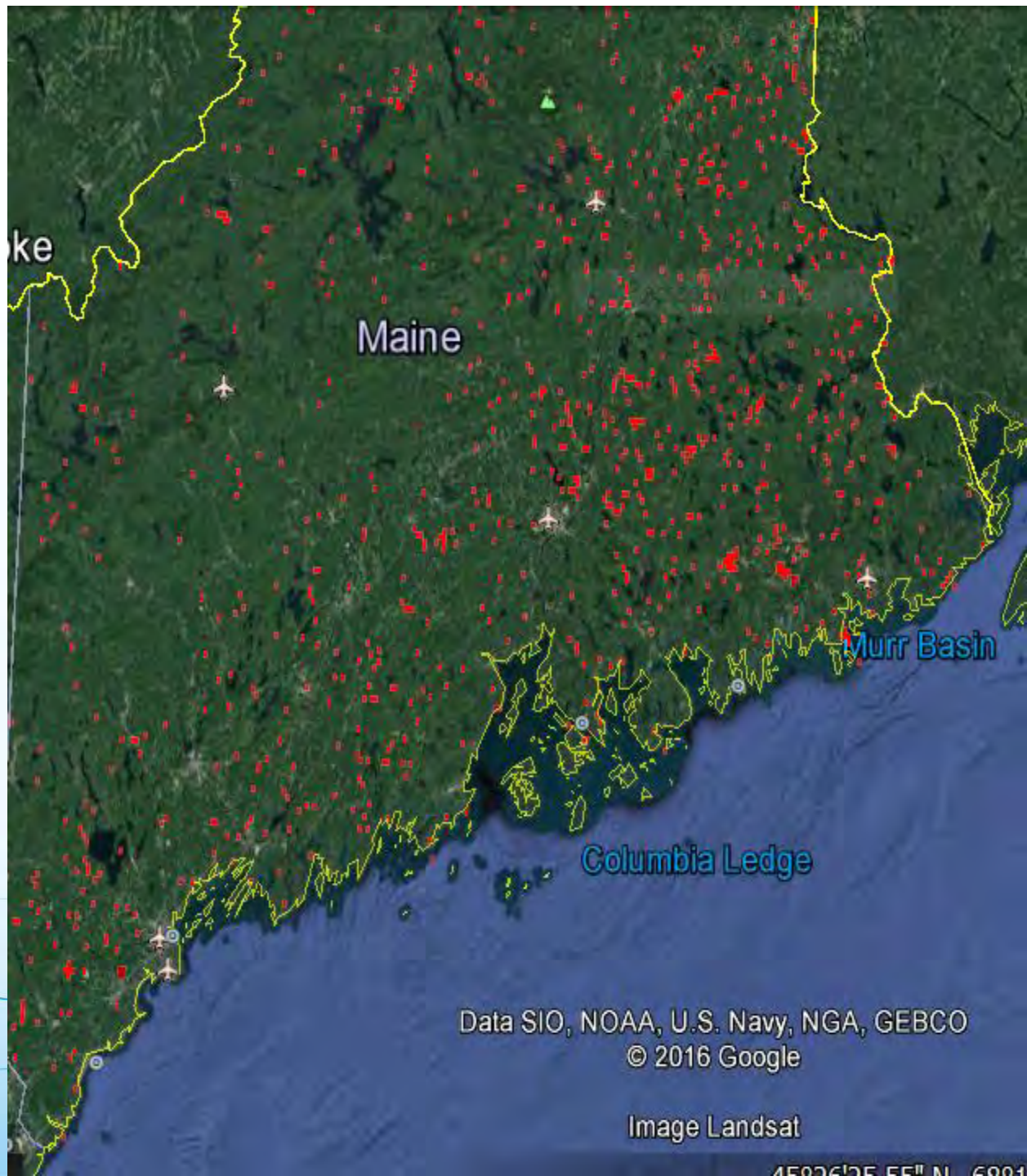


Classified all areas for potential *Culiseta* breeding habitat. Highest 'risk' areas are where 4 or 5 features overlap.

Overlapping Features

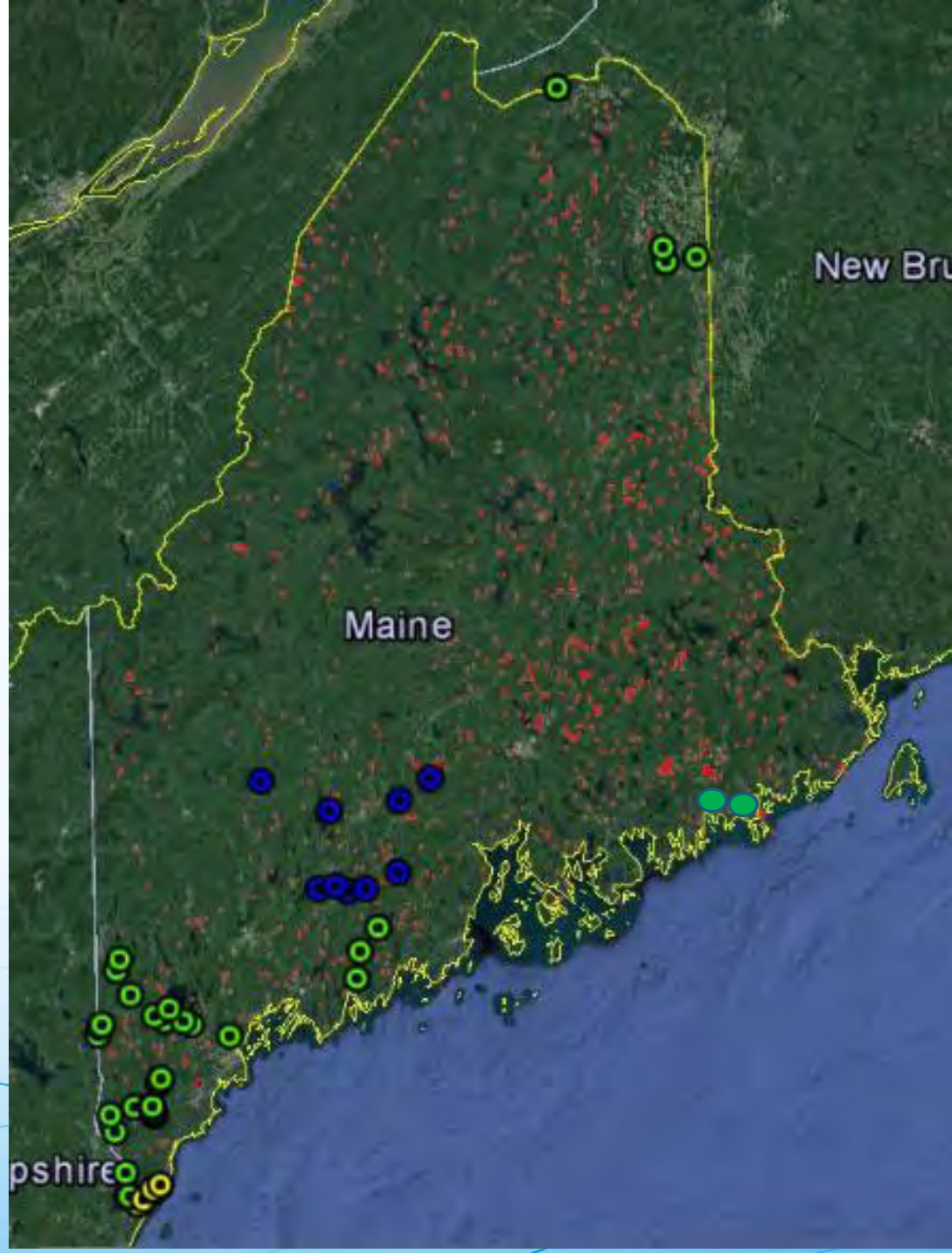
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 5



2016 Monitoring Sites

- MMCRI
- DACF
- MPM

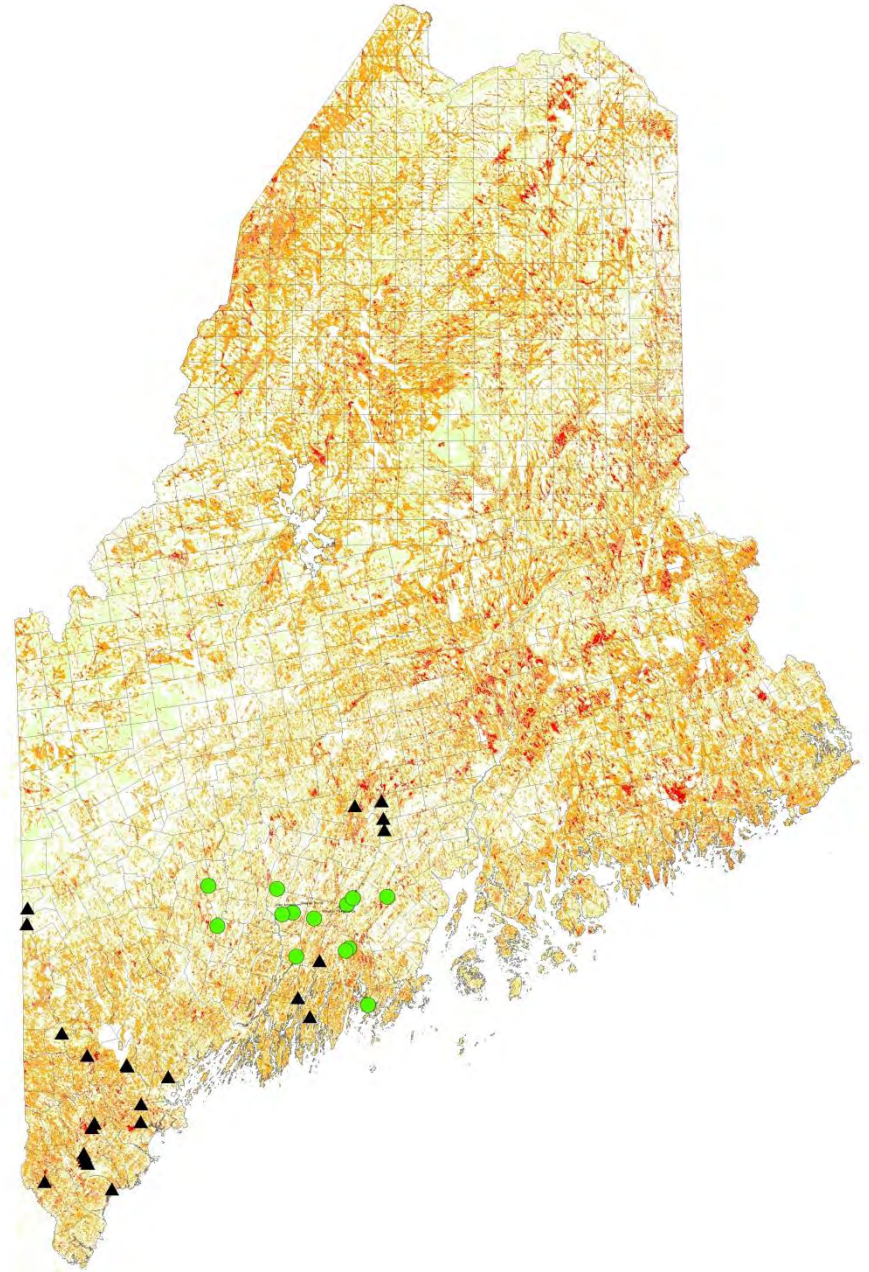
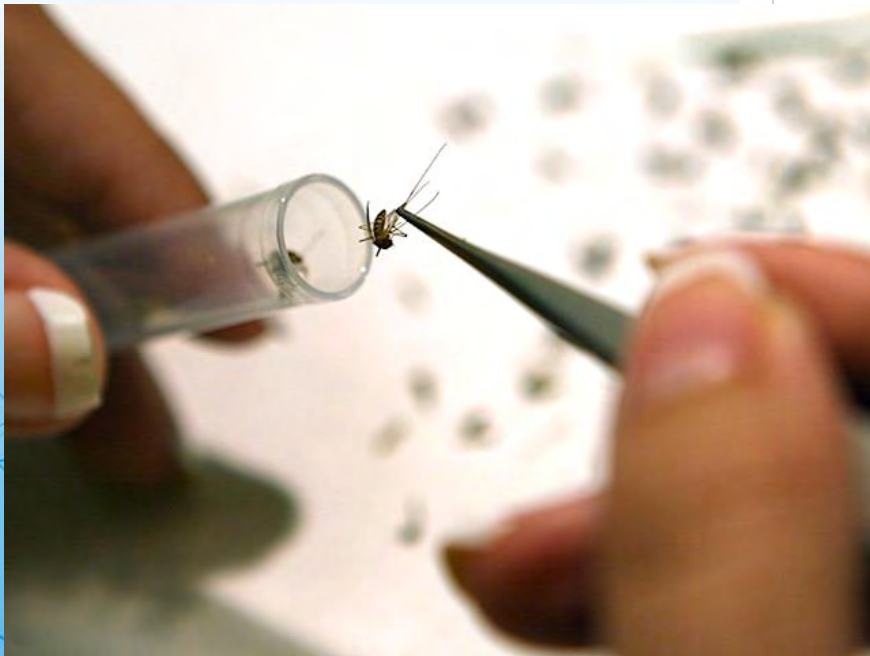


Ground Truthing

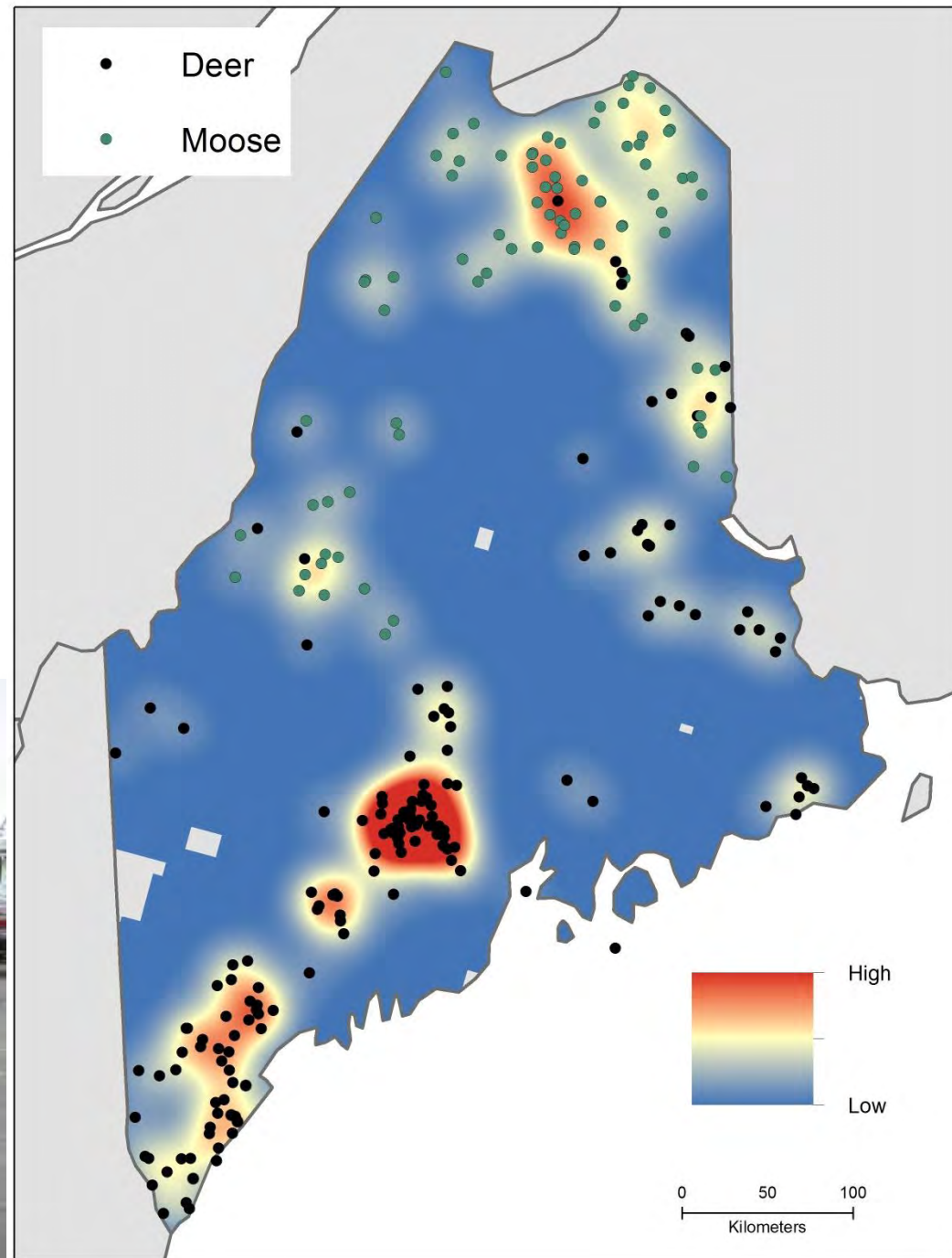
- * Visual Assessment
- * Criteria:
 - * Forested wetland
 - * Hardwood swamp
 - * Open understory



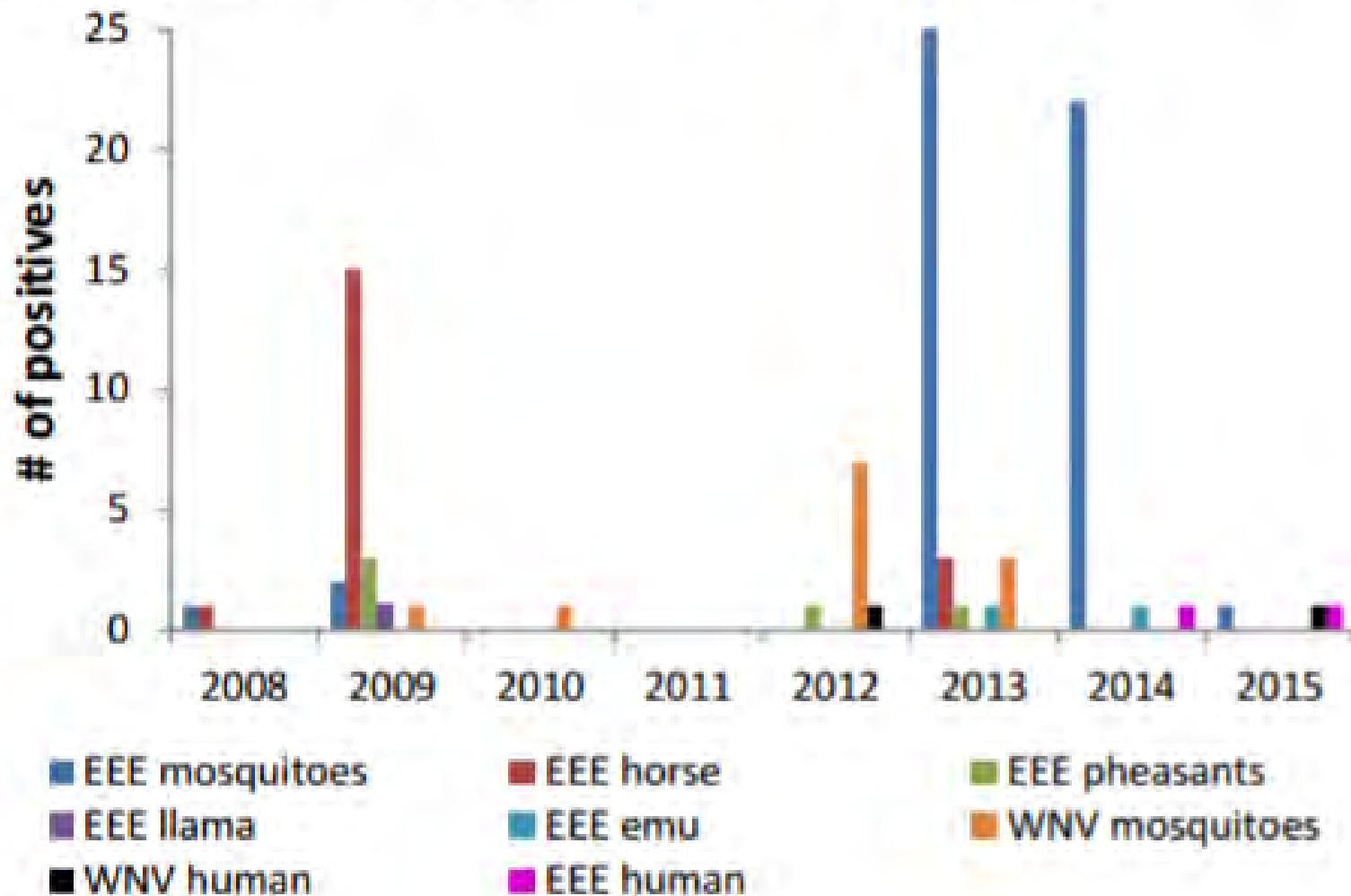
Will add geo-referenced positive mosquito pools to model



Cervid Serosurvey Data



Will add veterinary and human data to model too



More Tools for Modelling

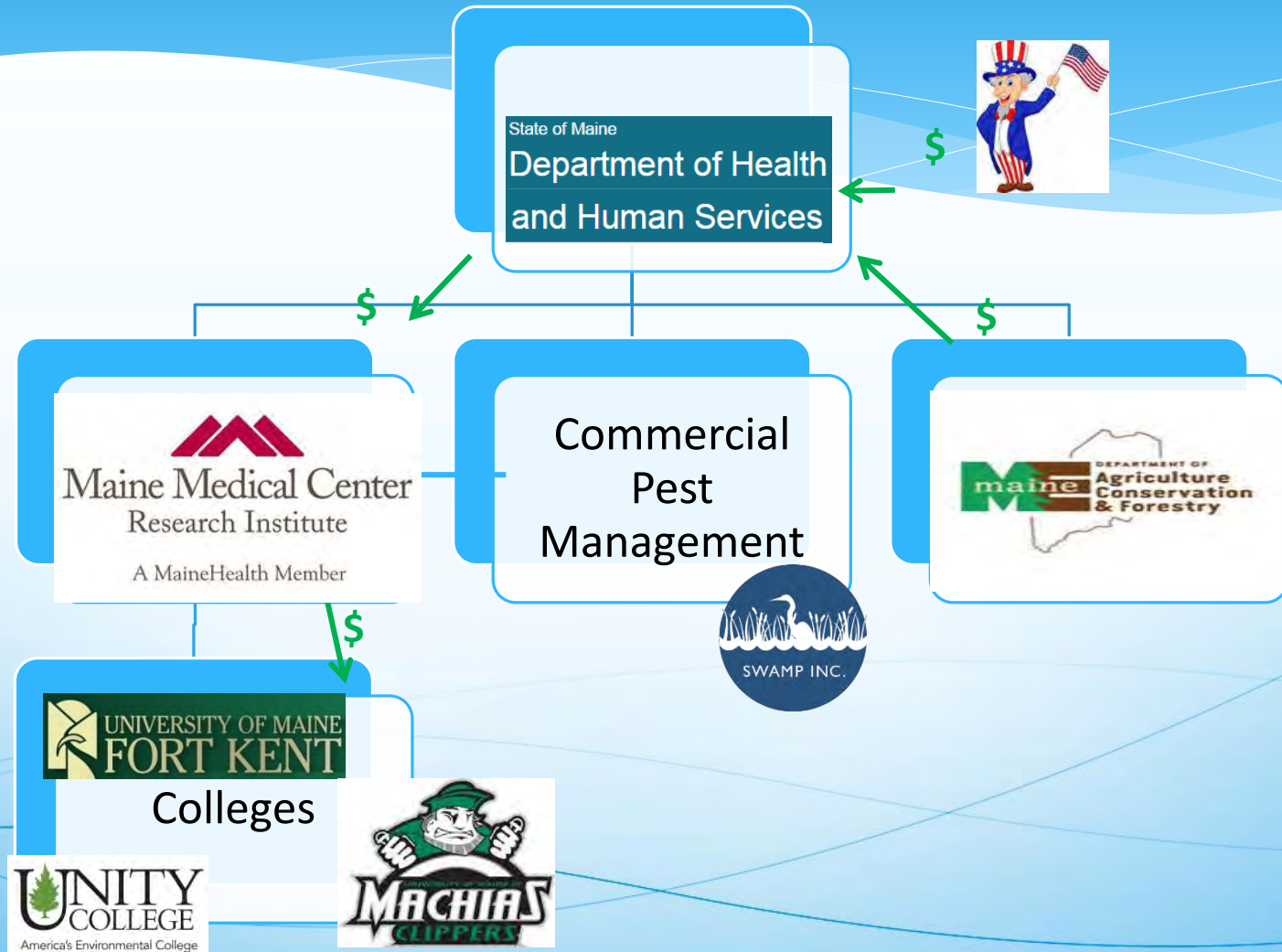
Normalized Differential Vegetation Index
(NDVI) – quantify canopy cover

Species Habitat Modelling

Response Planning

- * Provide guidance for municipalities
- * Public education
- * Prepare for state-level response
 - * Establish chain of command
 - * Train and mobilize people
 - * Mobilize equipment
 - * Intensify and/or expand mosquito surveillance
 - * Obtain permits
 - * Implement pesticide application operations

Collaboration



Maine Arbovirus Team



- * **Maine Dept of Health and Human Services**
State Lab tests mosquitoes for disease. Lead Agency for Vector-borne disease.
- * **Maine Dept of Agriculture, Conservation and Forestry:** mapping, mosquito surveillance. Pesticide expertise. Veterinary support. Funding
- * **Maine Medical Center Research Institute:** mosquito surveillance and research
- * **Municipal Pest Management** (aka Swamp, Inc). Mosquito surveillance and management
- * **University of Maine:** research
- * **Vector-borne Working Group:** bimonthly meeting to share and plan. Committees for wildlife, education, outreach.



