Thirty-Third Annual GMCA Meeting

Oct 20-22, 2010

Wednesday, Oct 20

SESSION 1

1) Opening Remarks/AMCA Washington Day – Candace Royals
   a) Saw every representative and both senators
   b) Focus on
      i) Surveillance funding
      ii) NPDES
         (1) Required as of April 2011
         (2) Bill in circulation to amend FIFRA to eliminate need for NPDES permit
   c) Periodic follow up
2) Using Mosquito Trapping to Target Your Vector Control Strategy – Nathan Burkett-Cadena
   a) Auburn University
      i) Master's degree work
      ii) Dr Gary Mullen
   b) Why use targeted mosquito control
      i) Reduce cost
      ii) Use less product
   c) Why do surveillance
      i) Determine which mosquitoes are present
      ii) Target control
      iii) Monitor virus
   d) Surveillance
      i) Adults
         (1) Landing counts – tells you what is biting
         (2) CO_2-Baited CDC light trap
         (3) CDC gravid trap
      ii) Larvae
         (1) Helps to determine future problem
         (2) Doesn't tell you what is biting
   e) Comparison of 3 trapping methods
      i) Site – parts and salvage yard
      ii) Light trap caught highest diversity of species
      iii) Gravid traps most useful for collecting vector of WNV
      iv) Landing counts got the nuisance species
   f) Using the data
      i) Aedes albopictus
         (1) Big nuisance species
         (2) Caught by all 3 methods
         (3) Biology
            (a) Day active

(b) Human biters
(c) Rest in vegetation
(d) Breed in tires
(4) Control – remove breeding sites

ii) Aedes vexans
(1) Only caught in light traps
(2) Diurnal
(3) Pulse breeders – all emerge at once
(4) Control – adults present; adulticide

iii) Culex restuans
(1) Doesn't bite humans often
(2) Light and gravid traps
(3) Maintenance vector for WNV
(4) May not need to be controlled

iv) Culex erraticus
(1) Will bite people
(2) Potential bridge vector for EEE
(3) Adults rest in tree hollows
(4) Harder to control

v) Conclusion – important to use a variety of trap types to get a better idea of what species are out there

3) Brownfields Redevelopment and Public Health: Scrap Tire Initiative – Julia Campbell
   a) Brownfield – abandoned, unused site with toxic potential
      i) Former industrial sites
      ii) Remediation required for potential chemicals on site
      iii) Economic drain
      iv) Associated health issues
      v) Become dump sites
   b) Federally funded project
      i) ATSDR Health Consultation and Health Education
      ii) Goals
         (1) Create and enhance community partnerships
            (a) Created tire dumping hotline to catch dumpers
            (b) EPD follow-up
            (c) Community incentive to continue keeping area clean
         (2) Reduce risk from brownfields
      iii) Background – Atlanta Beltline Redevelopment
      iv) Issues with bought land – abandoned rail lines
         (1) Radon testing
         (2) Scrap tire piles
      v) Want to develop these sites into parks and reservoirs
      vi) Site description – quarry site
         (1) Demographics
            (a) Primarily African-American
            (b) Largely high school education

(2) Site within 300 feet of a neighborhood
(3) Very overgrown
(4) Chemicals in soil
(5) Dumping

c) Tire piles
   i) 6 piles found within one mile of the quarry
   ii) Tires scattered everywhere (~4500 tires)
   iii) Tires were found to be breeding mosquitoes
   iv) Tires had to be treated before they were removed
   v) Partnered with Fulton County and Clarke Mosquito Control
   vi) Recycling removes the wires and chemicals
   vii) Go Green Roundup
      (1) Focus on Remove and Recycle
      (2) Lots of education on issues and recycling
      (3) Used volunteers
      (4) Media presence
      (5) Local elected officials involved
      (6) Community beautification project using scrap tire mulch
         (a) Very little chemical release from scrap tires
         (b) Benzene is volatile
         (c) Low risk for growing vegetables
         (d) Slow breakdown
d) Important to promote community involvement in projects of this nature
   i) Opportunity
   ii) Education
   iii) Involvement
e) Lessons learned
   i) Cost is an issue
   ii) Contracting can be a problem
   iii) Time can be a limiting factor
   iv) Follow-up is needed

4) INDUSTRY SPOTLIGHT
   a) UNIVAR – Joe Andrews
      i) Full line of permethrin-based adulticides
      ii) Larvicides
         (1) Bti products (teknar)
         (2) Altosid
      iii) Barrier spray products & equipment
      iv) ULV and thermofogging equipment
   b) Bayer Environmental Science – Don Botkin
      i) Water and oil based permethrin products
      ii) Voluntary cancelation of resmethrin registration
         (1) EPA testing required
         (2) Cost issues
         (3) Can be produced until the end of 2012
         (4) Can be sold indefinitely

(5) Need comments - http://www.regulations.gov/search/Regs/home.html#documentDetail?R=0900006480af099c

c) ADAPCO – Trey English
d) AMVAC – Peter Connelly

5) AFPMB: Who We Are and What We Do – William Sames
   a) Armed Forces Pest Management Board
      i) Military entomologists
      ii) Vector-borne disease risk assessment
      iii) Technical expertise and training
      iv) Research and development
      v) Disaster relief services and humanitarian effort support
      vi) Pesticide management
   b) Diseases
      i) ~60 of military importance
      ii) 63% (38) transmitted by insects or other arthropods
      iii) Select issues
         (1) Iraq and Afghanistan (Operations)
            (a) Problem
               (i) Leishmaniasis
               (ii) Sand fly vector
            (b) Training of soldiers in personal protection
            (c) Surveillance and control
         (2) Humanitarian Efforts
            (a) Food supplies given to host country
               (i) Handled by non-government agencies
               (ii) Do not want to become focus of effort
            (b) May do some limited vector control
            (c) Medical care
   c) Mission
      i) Most effective vector control and pest management capabilities
      ii) Military in all areas
   d) Directorate
      i) All branches of military involved
      ii) Research division
         (1) Military infectious diseases research
         (2) Deployed war-fighter protection program
      iii) Wide variety of committees
         (1) One staff member
         (2) Volunteers
      iv) Information division
         (1) Literature database
         (2) Free info
         (3) Website – www.afpmb.org
            (a) What's New
            (b) LRS search literature database (>200,000 articles available)

(c) Image library
(i) Free to use
(ii) Please give credit to AFPBM
(d) Identification DVDs
(i) Ticks
(ii) Larval mosquitoes
(iii) Adult mosquitoes
(e) Disease Vector Ecology Profiles
(f) Technical Guides
(g) Living Hazards database
(h) Pesticide information
(i) Walter Reed Biosystematics Unit

6) Dealing with FEMA – Robin English
   a) Background
      i) Public works focus
      ii) Training available at UGA
      iii) Available to help with disaster questions
      iv) Keeps a database of info on what municipalities are doing
   b) Problem
      i) Issues occur quickly
      ii) Many issues occur at once
   c) People suddenly need answers
   d) Documentation is important
   e) Solution
      i) Create a Command Center
         (1) Phone operators
            (a) Document complaints
            (b) Monitor fire and 911
         (2) Dispatcher
            (a) Direct staff
            (b) Collect status of repair needed
            (c) Collect labor and materials cost data
         (3) Director oversees operation
         (4) Create FEMA Project worksheets
      ii) Collect data – documentation is key
      iii) Take photographs
      iv) Money is usually being spent before declaration occurs
      v) Be sure to correct discrepancies before handing info over to FEMA
   f) Be prepared before the emergency
      i) Document every day (SOP)
      ii) Sheets must be turned in for payroll
         (1) Datasheet for all purposes
         (2) Eliminates discrepancies when documenting for FEMA
         (3) Provides proof
   g) FEMA Project worksheet
      i) 3 categories

(1) A – repair to predisaster conditions
(a) Must be a routine maintenance-type program
(b) 100% reimbursement
(c) Do this during the day
(2) B – emergency work
(a) Overtime reimbursed only
(b) Do this at night
(3) Debris removal
(a) Overtime only reimbursed
(b) Push it off the road and deal with it later
ii) Group like activities together
iii) Estimates can be used if repairs have not been completed
(1) You will only be paid the estimated amount
(2) Get as close as you can to actual cost
(3) Vector issues
(a) Can do an estimate on anticipated problem
(b) Brought in chemical
(c) Aerial contingency contract
(d) Get it in
(i) Need documentation
(ii) Need to prove need – 3 years prior data
(iii) Need a public health declaration
iv) Project size
(1) Small <$63,200
(2) Large >$63,200
v) Bottom line –
(1) Need to prove everything
(2) FEMA will check everything

h) Documentation
i) Payroll
(1) Hourly rates
(2) Benefits
(3) Taxes
ii) Materials purchased or contracts utilized
(1) Invoices
(2) Canceled checks
iii) Photographs
(1) Need before and after pictures
(2) Stock items

i) You must be willing to do needed repairs before being reimbursed
j) DO NOT WAIT FOR THE DISASTER
k) FEMA
i) All forms available on website – www.fema.gov
ii) Lots of info on site

7) Practical Larviciding – Bobby Moulis & Ben Brewer
a) Freshwater habitat

i) 2 basic types of habitat
(1) Natural
(a) Seasonal considerations
(b) 3 river systems – mosquito species vary
(c) Wide variety of habitats
(i) Natural sites primarily produce floodwater species
(ii) Also have some permanent water species habitat
(iii) Old ricefields – tide gate issues
(2) Man-made
(a) Storm drains
(b) Artificial containers
(c) Tires
ii) Procedures
(1) Mapping info is very important
(2) Larval surveillance and ID
(a) Dippers are a necessity
(b) Water depth measurements provide good info
(c) Rain gauges provide local weather info
(3) Treatments
(a) Aerial control
(b) Gambusia

b) Saltmarsh habitat
i) Breeding sites are usually at upland edge of marsh
ii) 6' average tide every day
(1) 3' above sea level
(2) 3' below sea level
iii) Primary species
(1) Ochlerotatus taeniorhynchus
(2) Oc sollicitans
iv) Breeding can occur wherever there is tidal flow
v) Control
(1) Agnique
(2) Methoprene for larger areas (briquettes don't work
vi) New safety rule
(1) Must always go with someone
(2) Too many hazards

8) Demise of Small Programs – Rosmarie Kelly

Thursday, Oct 21

<u>SESSION 2</u>

1) The Status of Entomology in Georgia – Ray Noblet
a) UGA entomology
i) Budget cuts
(1) Cut 21% over 2 years

(a) Extension
(b) Research
(2) Enrollment has stayed strong
(3) Entomology enrollment
(a) 20 undergrads
(b) 45 grad students
ii) Reorganizing Cooperative Extension
(1) Until 2010 had agents in every county
(2) In future, some agents will be serving more than one county
iii) Programs
(1) GA County issues
(2) Priorities
b) Programs – Core Areas
i) IPM programs
ii) Basic Insect Sciences
iii) Urban and household/structural pests
iv) Medical entomology
(1) Livestock
(2) Poultry
v) Systematics and Evolutionary Biology
vi) Invasive species
vii) Applied ecology
c) New foci
i) Plant-vector biology (Tifton Campus)
ii) Insect Symbionts (Athens Campus)
iii) Immune response of mosquitoes (Athens Campus)
d) Black Fly lab
i) Bti work began in 1980s
ii) Colony established by Cupp (University of Arizona) ~1989
iii) Some research from the lab
(1) Began with pesticide work in 2003-2008 (Jay Overmyer)
(2) Examination of contaminants in streams that may affect the activity of Bti
(3) Antibiotics as stream contaminants (Joe Iburg)
(4) Stream chemistry and impact of naturally occurring materials
iv) Some lab outcomes
(1) Bioassays
(a) Streamside bioassay I – mortality based (Gray & Iburg)
(b) Streamside bioassay II – feed based (Iburg & Gray)
(c) Good for examination of factors specific to stream site
(2) Gates Foundation work – African River Blindness (Onchocerciasis)
(a) Egg pheremones
(b) Trap development
(c) Test attractants
2) Marsh Restoration – Ben Brewer
a) Most saltmarsh was ditched at one time

b) Mosquito issues
    i) *Ochlerotatus sollicitans* and *Oc taeniorynchus*
    ii) Massive emergence from brackish water sites
    iii) Usually located near expensive housing
    iv) Saltmarsh species will fly many miles for a blood meal
    v) Water flow and drainage are compromised
c) Options
    i) Reditch
    ii) Open marsh water management
d) Why the problem
    i) Development impacts salt marshes in negative ways
    ii) Silting occurs
    iii) Spoil sites
    iv) Impervious surface increases
    v) Immovable objects are added that block flow
    vi) Effects
        (1) Degradation of current ditches
        (2) Lack of maintenance
        (3) Addition of roads, causeways, dykes, dams, bike trails, etc
        (4) Bridge size insufficient
        (5) Impoundment walls
        (6) Flood gate issues
        (7) Canalization
e) Hydrology in saltmarsh is confusing
    i) No one really knows how to figure out how much water flow is needed to reduce/eliminate mosquito breeding
    ii) How many ditches?
    iii) How large a culvert?
    iv) What are the long-term impacts?
f) Who makes the decisions?
    i) Elected officials depend on engineers
    ii) Corp of Engineers mitigation programs
g) Proposal
    i) Maintain current ditches
    ii) Use ponds to harbor predatory fish
    iii) Need to collect lots of different data from site over many years
        (1) Before and after mosquito data
        (2) Biota
h) Hydrology study
    i) Got a grant
    ii) Look at water flow in and out of site and at various locations within site
    iii) Collect data on marsh chemistry and biota
        (1) Water chemistry
            (a) Salinity
            (b) Peizometer data - used to measure the hydraulic head of water (tidal flow)

(c) Flow meter
(2) Biota –
(a) On transects
(i) Fish number and species
(ii) Plant life
(iii) Mosquitoes
(iv) Clams
(v) Snails
(b) In general
(i) Wading birds
(ii) Other animal life
iv) Before and after data
v) Use GIS to determine areas of high and low marsh
vi) Important to make changes using good data
vii) Use sings to educate public
viii) Potential problem – new administration at mosquito control

i) Food for thought
i) Does a mixture of man-made and natural work?
ii) How important are the plant species?
iii) Is there really a mosquito problem? YES

3) AMCA and NPDES Update – Joe Conlon
a) AMCA
i) Annual meeting 2011 – Anaheim, CA
ii) Publications
(1) Journal
(2) WingBeats
(3) Various reports and books
(4) Webinars
iii) Student competition at annual meeting
iv) PESP partnership
v) Website – www.mosquito.org
vi) Toolkit for communication programs
vii) Legislative & Regulatory affairs
(1) Washington Conference
(a) May 9-11, 2011
(b) Westin Alexandria, VA
(2) Activist activities
viii) Public service announcements –
(1) "I'm One"
(2) Nebraska PSA – available from Joe
ix) Mosquito Awareness week
x) Young professionals group – grad students
b) NPDES and Clean Water Act
i) Activist
(1) These are people who feel that it is acceptable for a child to die of EEE because mosquito control is not allowed to do their job

(2) These are the people who will sue mosquito control regardless of whether they win or not

ii) Mosquito control must always act professionally and be knowledgeable of mosquito control activities

iii) FIFRA vs CWA
  (1) FIFRA
    (a) Cost-benefit: accepts some adulteration for higher benefit
    (b) Risk-based: probability
    (c) $7000/incident: fine for
    (d) No citizen suits – can not sue an individual worker at the program
  (2) CWA
    (a) No cost/benefit: very black-and-white
    (b) Hazard-based: possibility
    (c) $37,5000/day: fine, higher if done knowingly
    (d) Citizen suits

iv) General permit
  (1) Notice of intent (NOI)
  (2) Effluent
    (a) Technology-based (TBELs)
    (b) Water quality based (WQBELs) – covered by FIFRA
  (3) Site monitoring
  (4) Pesticide discharge plan
  (5) Monitoring
  (6) …

v) Comments
  (1) Decision maker should be responsible for NOI
  (2) Possible phase-in after April deadline
    (a) NOI – 3 months
    (b) PDMP – 6 months
  (3) All applicators, NOI or not, must perform IMM
  (4) Regions will be arbiter
  (5) Non-covered may opt-in (more an agricultural issue)

vi) Comments from activists
  (1) No *de minimus* deposition of pesticides
    (a) Believe all pesticides leave a residue
    (b) Length of time residue is in environment does not matter
    (c) Supported by CWA
  (2) Subtle effects may endanger life processes
    (a) Suspected endocrine disrupter effects
    (b) May be true but hard to study or enforce
    (c) Want Naled to be covered by a separate permit
  (3) Everything should be made public
    (a) Transparency is not a bad thing
    (b) What about the “crazies”?
    (c) Want detailed reports on everything

vii) NOI

(1) Filed electronically
(2) Who you are and what you plan to do
(3) 25(B) not exempt
(4) Pesticide application threshold
(a) AMCA/activists – no thresholds
(i) Why – mosquito control is not the problem
(ii) Everyone should be held accountable (good luck with that)
(b) Small Business Administration – populations >50,000
(c) Responsible Industry for Sound Environment
(i) 10,000 acres adulticide
(ii) 2,500 acres or water or 200 linear miles
(d) EPA
(i) 6400 acres adulticide
(ii) 1000 acres larvicide
(iii) Not required by states regardless of scale-of-operation
1. If the info can be acquired elsewhere
2. Thresholds can be higher or lower than EPA's
3. Will open things up for litigation

viii) Impaired/Tier 3 water
(1) Tier 3 waters are identified as outstanding national resource waters
(2) Impaired water are environmentally damage
(3) EPA
(a) Except for certain temporary changes, water quality can not be lowered
(b) Temporary is weeks or months
(4) Activists want no chemical control in either of these water types

ix) Effluents
(1) Identify problem
(2) Establish action thresholds
(3) Activist want the EPA to set action thresholds
(4) BMP needed – http://www.mosquito.org/secure/upload/articles/BMPsforMosquitoManagement.pdf
(5) Must evaluate pest management strategies
(6) AMCA
(a) EPA document presuppositions are too prescriptive – asking for precise quantities
(b) Want to use "use lowest effective amount of pesticide product per application" – label specs
(7) Activists
(a) Evaluate each and every IPM alternative before choosing a control strategy
(b) Guidelines should be developed for preferred strategies
(c) EPA should mandate specific control measures
(d) Must sign off on each task every time an application is made

(e) Wanted mosquito control to be required to use the least toxic control method every time
(i) Sounds reasonable
(ii) Doesn't always work and may lead to a bigger control problem
(8) Best professional judgment should rule the day
(9) Meaningful input from concerned members of the public should occur before any discharge occurs
(10) Think that all pesticide application is regular and predictable
(11) 30-day comment period on TBELs

c) Emergencies
i) Activists
(1) Want an emergency to be determined by an environmental agency
(2) Mere economic loss can not qualify as an emergency
(3) Reasonable comment period before application
ii) Removes mosquito control AND public health from the process

d) Monitoring
i) Should be doing this
ii) IPM started with the mosquito control industry
iii) Required
(1) Visual
(2) At application area
(3) Looking for effect on non-targets
(a) When will this occur
(b) Who will do it
iv) No ambient water quality testing required
(1) Thinking of some large scale studies by states
(2) Where will the money come from?
v) Pesticide discharge management plan
(1) Documents how BMP is going to be undertaken
(2) Not subject to challenge
(3) Includes surveillance and record-keeping
(4) http://www.mosquito.org/secure/upload/articles/BMPsforMosquitoManagement.pdf
(5) Includes how these practices will be met
vi) Activists
(1) EPA should develop water quality criteria
(2) Want in-stream monitoring after each pesticide application
(3) Very concerned about (of all things) Bti
(4) Feel discharges are predictable and can be made part of the planning and budgetary process
(5) Need to document why larviciding is not the primary method – professional insult
(6) Want to give individuals the power to ask for stronger rules
vii) Big problems
(1) Will be subject to interpretive challenge by non-mosquito control pesticides

(2) Will be subject to litigation
(3) Mis-interpretation of IPM techniques

e) Adverse incidents
   i) What constitutes a *boni fide* adverse affect
   ii) How do you measure an indirect adverse affect
f) Reporting and record-keeping
   i) May include logs and adverse incidents
   ii) IMM plans, annual reports
   iii) Can be state-specific
   iv) Accessible by the public via the EPA
g) Legislative relief is on the horizon
   i) FIFRA amendment
      (1) S.3735
      (2) HR 6087
      (3) Amends sections of FIFRA stating that no additional permits are required
   ii) HR 6273 amends both FIFRA and the CWA
      (1) Exempt CWA to exempt mosquito control and some agriculture
      (2) Amend FIFRA
   iii) Won't happen quickly
h) Websites
   i) EPA - http://cfpub.epa.gov/npdes/index.cfm
   ii) GA EPD - http://www.gaepd.org/

4) INDUSTRY SPOTLIGHT
   a) Clarke Mosquito Control – Joe Strickhouser
   b) Valent BioSciences – Candace Royals
      i) Microbial pesticides
      ii) Vectobac –
         (1) Gold standard Bti
         (2) Mosquitoes, midges, and black fly
      iii) Vectolex
         (1) B sphaericus
         (2) Designed for organic habitats
         (3) Primarily targeted Culex spp
         (4) Limitations – saltmarsh and some container species
      iv) Vectomax
         (1) Combines capabilities of both products
         (2) Single brood with residual
   c) AllPro – David Sykes
      i) New products for 2011
      ii) Some label changes
      iii) Sell equipment and chemical
5) ULV Applications – David Sykes
   a) History
      i) WWII technology – smoke generators
      ii) Latta and LaMer ~1945
         (1) Noticed some insecticidal action

(2) Used a mix of kerosene and a carrying agent

iii) Thermofogging

(1) Method started commercial in 1946

(2) Used DDT and kerosene initially

(3) Still very effective

(a) Good control in heavy vegetation

(b) Definite traffic issue

b) ULV

i) History

(1) 1966 – first ULV machine developed as a joint project between the US Navy, Jacksonville, FL and the US Dept of Agriculture

(2) Developed during the 1960s

(3) Many ULV papers presented during the 1970s by Dr Gary Mount

ii) Droplet sizing

(1) Statements on label

(a) Dv0.1 – calculated size where 10% of droplets are smaller

(b) Dv0.5 – 50% of droplets are smaller

(c) Dv0.9 – 90% of droplets are smaller

(2) Most effective droplet size will increase effectiveness

(a) Too big –

(i) Not enough "bullets"

(ii) Drop out of air quickly

(b) Too small –

(i) Miss target

(ii) Rise up out of area where mosquitoes are found

iii) Calibration

(1) The label is the law

(2) Important for good control

(3) Economic concerns

(a) Too much product breaks the bank

(b) Too little product drives resistance

iv) Application rates

(1) Follow the label

(2) Limitations may be listed

(3) Know who you are buying from - low cost does not necessarily mean good control or make good economic sense

v) Many different systems available

(1) Different nozzles

(2) Different pumping systems

(3) GPS

vi) Service

(1) Check chemical lines

(2) Check mechanical parts

(3) Keep machine clean

vii) When to spray

(1) Need a temperature inversion

(2) Need sufficient wind speed
(3) Environmental conditions important

SESSION 3

1) *Anopheles crucians* complex and bringing *Anopheles georgianus* Home – Bruce Harrison
   a) *Anopheles crucians* complex
      i) Described from 1828 from the New Orleans area
      ii) Described as a group
         (1) An crucians
         (2) An bradleyi
         (3) An georgianus
      iii) Floore, Harrison, & Eldridge (1976)
      iv) Importance
         (1) *An crucians* was found to be a good lab vector of malaria in the US in the 1920s
         (2) Did not hold true in the real world
         (3) EEE isolated from *An crucians* LA and GA in the 1950s
         (4) Found positive for LaCrosse and WNV
      v) Adults
         (1) Can not tell the difference morphologically
         (2) What differences occur are highly variable
      vi) Can separate species in the larval stage
      vii) *An crucians* is much more common in the SE than the other two sibling species
      viii) Sibling species abound
         (1) Mitochondrial DNA study
         (2) A USDA study determined 2 more sibling species in 1993
         (3) 2004 – an additional species was determined using morphological techniques
   b) The "real" *An georgianus*
      i) Last confirmed specimen collected in 1951
      ii) Will bite people
      iii) Not thought to be medically important
      iv) Paper by Willis Reed describes larval habitat for *An georgianus*
         (1) Limestone and solution depression areas
         (2) Clear water seeps
         (3) Wiregrass/longleaf pine ecosystem
      v) Must find the right habitat
      vi) The search
         (1) North Carolina
            (a) Collected in several wiregrass/pine habitat areas
            (b) Adults reared from collected larvae fit the characteristics of *An georgianus*
            (c) Determined to be an additional sibling species – now up to 7

(2) Carolina Sandhills National Wildlife Refuge, SC
(a) Habitat
(i) Tiny deer tracks
(ii) Water seeping down the hill
(iii) Wiregrass and pine
(b) Found *An georgianus*
(3) The Joseph W. Jones Ecological Research Center at Ichauway
(a) Has been listed as occurring in area
(b) Did not find any larvae
vii) Larval characteristics
(1) Larvae play dead
(2) Found in shallow clear water
(3) Can easily ID larvae from other known sibling species in the *An crucians* complex

c) Problem
i) Seven sibling species
ii) Most are un-named
iii) Type specimens are hard to find and in poor condition
iv) Much less larval surveillance being done now
v) Need someone to take up this group
vi) Everything has to be called *An crucians* complex because it is uncertain which species you have actually collected

2) A sentinel Virus for WNV – Abelardo Moncayo
a) Background
i) Flanders virus
(1) Data from GA and TN
(2) Was found in mosquitoes during SLE surveillance work
ii) WNV
(1) Zoonotic
(2) Bird-mosquito-bird cycle
iii) Flanders may be using a similar cycle
(1) Found in the same mosquito species
(2) Need more data on birds
iv) Use of similar cycles – Highland J and EEE

b) Flanders virus
i) Rhabdovirus
ii) Described from the Town of Flanders on Long Island – 1960
iii) Thought to be non-pathogenic
iv) Does cause pathology in vertebrate cells
v) Can kill mice if injected

c) Surveillance
i) Data
(1) TN
(a) Data from 2006-2009
(b) 6 counties
(c) >18,000 pools

(2) GA
(a) Data from 2001-2009
(b) …
ii) Virus isolations of Flanders and WNV occur in the same sites
iii) Time displacement seen
d) Relationships
i) Temporal relationship
(1) Flanders seen in TN in April with peak in June
(2) WNV seen starting in June with peak in August
(3) Similar pattern seen in GA
(4) Mean time of appearance of WNV after Flanders
(a) Within a 1-km distance
(i) TN – 52 days (2 month displacement)
(ii) GA – 28 days (1 month displacement)
(b) Within a zip code
(i) TN – 54 days
(ii) GA – 31 days
ii) Spatial relationship
(1) TN – 0.14 miles
(2) GA – 2.28 miles
e) Determining risk
i) Can Flanders predict WNV?
ii) Look at intensity of positives using GIS
iii) Correlations
(1) Low numbers – no correlation seen
(2) Increasing numbers – moving towards correlation
(3) High numbers – good correlation
iv) Predictability displaced through time
v) Positive predictive value (PPV)
(1) TN
(a) Specificity – high
(b) PPV – up to 100% at zip code level
(2) GA
(a) Specificity – high
(b) PPV – up to ~60%
f) Conclusion
i) Flanders occurs before WNV
ii) Found in the same mosquito species
iii) Can help target control measures
iv) Can act as a sentinel for WNV
3) INDUSTRY SPOTLIGHT
a) Central Life Sciences – Charlie Pate
i) Larvicide – Altosid
ii) Adulticide – Zenivex
(1) Oil-based
(2) No PBO

(3) Control comparable to Biomist
iii) Barrier spray – Mavrik
b) Gregory Pest Solutions – Larry Motes & Rodney Nottingham
i) http://www.gregorypestcontrol.com/
ii) Opened in1972
(1) Started in Greenville, SC
(2) Currently 8 locations in SE
iii) Full-service pest control company
4) Snakes! – Bobby Moulis
a) Herpetology – study of reptiles and amphibians
i) Amphibians
(1) Frogs and toads
(2) Sirens and salamanders
ii) Reptiles
(1) Alligators
(2) Turtles
(3) Lizards and snakes
b) Not all snakes are venomous
i) Of Georgia's 40 different species of snakes, only six are venomous.
ii) All venomous snakes in GA, with the exception of coral snakes, have vertical pupils; non-venomous snakes and coral snakes have round pupils
c) Websites
i) http://www.uga.edu/srelherp/snakes/index.htm
ii) http://www.animalsouth.com/index.php?option=com_content&view=article&id=70&Itemid=75
iii) http://www.georgiawildlife.com/node/497
d) Amphibians and Reptiles of Georgia – UGA Press
5) Barrier Spray & Mosquito Surveillance – Fred Koehle
a) Problem with mosquitoes in downtown Augusta
i) Everything one one side of US 1 is commercial
ii) Everything on the other side is residential
b) Purpose
i) Reduce ULV spraying
ii) Reduce complaints
iii) Develop a plan
iv) Get better control
c) Equipment
i) 2008 610 Kawasaki mule
ii) Restored herbicide sprayer
iii) 2 techs
d) Selection criteria
i) Business locations
ii) Restaurants
iii) Parking areas
iv) Special events
v) People

vi) Complaints
e) Surveillance
i) Pre and post spray counts
ii) Monitored rain events
f) Barrier spray "failure" would result in ULV spray in residential area
g) Results
i) Good initial results
ii) Rain caused spike in number of mosquitoes
iii) Complaints reduced to zero
h) Problems
i) Rain
ii) Sprinkler systems running on days they were not suppose to
i) Conclusions
i) Barrier spray appears to be working
ii) Rain can be a problem
iii) Sprinkler issue being dealt with
iv) A 6-week rotation seems ok for now
v) Numbers aren't real impressive but complaints have dropped significantly
vi) Media coverage of surveillance program
vii) Mule and sprayer accepted by the public

6) Chatham County Green Initiative – Henry Lewandowski
a) Prelude
i) Inter-relationship between society, economy, and environment
ii) Need to be a sustainable development community
iii) Chatham County passed a resolution to become the "greenest county in Georgia"
b) Chatham Environmental Forum
i) Formed in 1989
ii) Participants
(1) Business
(2) Environmental groups
(3) Government
iii) Consider best scientific principles
iv) 188 action items developed
v) Encompasses entire community, public and private
c) Henry's role
i) Work within county government
ii) Bring about a cultural change
iii) Meet with various departments and agencies within county government
(1) Department heads
(2) Mid-level managers
(3) Workers
iv) Training
(1) LEED training - http://www.green-buildings.com/

(2) Energy audit training - http://www.hud.gov/offices/cpd/affordablehousing/training/web/energy/help/audits.cfm

d) Progress
   i) Carbon footprint
      (1) Calculated in 2007 and 2008
      (2) Baseline: equivalent of 21,092 tons of CO_2 at an annual cost of $6M
      (3) Use this to identify largest users
      (4) Identified projects to correct energy deficiencies
      (5) Websites
         (a) http://www.carbonfootprint.com/calculator.aspx
         (b) http://www.epa.gov/climatechange/emissions/ind_calculator.html
   ii) Bronze level partner in sustainable Georgia
      (1) Website - http://www.gasustainability.org/documents/pp_home.html
      (2) Run through DNR
   iii) Conservation block grant
   iv) Action list matrix
   v) Developing an internet site
   vi) County manager requests – determines which projects get priority
   vii) LEED Certification of major county construction: 20-30% savings in annual costs

e) Summary
   i) Steep learning curve
   ii) Very rewarding
   iii) 2 counties are now partners in sustainable Georgia
      (1) Chatham
      (2) Bartow
   iv) Now require LEED certification when constructing county-owned buildings

7) PESP – Elmer Gray
   a) Doug Wassmer – PESP guru
   b) Background
      i) 1992: National IPM Forum identifies a lack of commitment to environmental stewardship
      ii) 1993: USDA, EPA, FDA pledge to have 75% of agriculture using IPM by 2000
      iii) 1994: Pesticide Environmental Stewardship Program established
         (1) Reduce pesticide risk
         (2) Use of IPM
         (3) Importance of training of pesticide applicators
   c) Mosquito industry regularly and routinely practices IMM
      i) Education/Communication
      ii) Surveillance
      iii) Source reduction
      iv) Larviciding
      v) Adulticiding
      vi) AMCA Environmental Committee established
   d) Process

i) Strategy document required
ii) Mosquito control comes in under AMCA
iii) Must be sustaining members
iv) Provide annual reports

e) Why do this
i) Gives mosquito control "street cred" with environmental groups
ii) EPA liaison assigned
iii) Can be used as a talking point to concerned citizens
iv) PESP logo can be used on educational materials after approval

f) AMCA is now a gold-level PESP member

g) GMCA
i) Developed and submitted document in 2010
ii) Received unanimous approval from sub-committee
iii) Final vote is pending
iv) Document
(1) Overview
(2) Problems
(3) "Typical" program – varies greatly in Georgia
(4) Purpose of organization
(a) Promote IMM
(b) Disseminate mosquito info
(c) Do good control
(d) Protect public and animal health

h) Problems facing our profession
i) Small pesticide market
ii) Insecticide resistance
iii) Exotic species

i) Recent progress
i) Training
ii) Mosquito control pesticide category
iii) Annual meetings
iv) Cooperation between industry, government, and commercial entities

j) Measurable components – we need your help

Mid-Atlantic Mosquito Control Association (MAMCA)

- http://www.mamca.org
- Regional 8 state organization
- 2011 Conference
  - Hilton Riverside in Wilmington NC on Feb 22-24
  - NPDES Panel Discussion
- Membership
  - Newsletter
  - State reports

Friday, Oct 22

SESSION 4

1) Dengue – Mark Blackmore
    a) RNA virus
        i) 4 serotypes
        ii) Related to WNV & SLE
        iii) Immunity is to the specific serotype
        iv) Disease
            (1) Dengue fever
                (a) Can be mild and non-specific
                (b) Can include:
                    (i) Sudden high fever
                    (ii) Severe headache
                    (iii) Pain behind eyes
                    (iv) Joint pain
                    (v) Rash
                    (vi) Nausea
            (2) Dengue hemorrhagic fever (DHF)
                (a) Severe abdominal pain
                (b) Bleeding
                (c) Bloody stools
                (d) Bloody vomit
                (e) High mortality
    b) Transmission
        i) Disease of humans
        ii) Vectors
            (1) Ae aegypti
            (2) Ae albopictus
        iii) Viremia lasts several days
        iv) Extrinsic incubation period ~1 week
        v) Intrinsic incubation period ~1 week
    c) Worldwide burden
        i) Cases have increased over last 30 years
        ii) Number of affected countries also increasing
        iii) Tropical distribution
    d) Modes of introduction
        i) Variety of ways
        ii) Most likely is by an infected human
    e) Florida outbreak
        i) Imported cases
            (1) Number of imported cases have been increasing over the last few years
            (2) Number of imported cases doubled between 2009 and 2010
                (a) Probably an artifact due to increased vigilance
                (b) Coming in from many different cases
        ii) Ecology good for local transmission

(1) Suitable hosts
(2) Suitable vector
(3) Sufficient rainfall
(4) Warm climate

iii) Outbreak identification
(1) 1 Sept 2009 – index case
(a) New York visitor diagnosed with dengue
(b) No other travel
(2) Location – Key West
(a) Many visitors
(b) *Ae aegypti* present
(c) *Ae albopictus* absent
(3) More cases were confirmed in the area
(4) Confounder – swine flu outbreak was occurring during the same time period

iv) Medical record search
(1) Look for specific symptoms
(2) Excluded patients with respiratory involvement
(3) Found 4 additional cases

v) Serosurvey
(1) Objectives –
(a) Look at prevalence of dengue in Key West
(b) Determine risk factors
(2) Questionnaire
(a) Demographics
(b) Screened windows/AC
(c) Repellent use
(d) Containers
(e) Medical history
(3) Ended up with ~900 houses
(4) Results
(a) 13 of 240 participants had evidence of dengue infection
(b) ~1 in 20 were seropositive
(c) Risk factors
(i) Young, male, black
(ii) Containers with water
(iii) Lots of vegetation
(iv) Low AC use
(5) Strengths and limitations
(a) Large sample
(b) Conducted in a timely manner
(c) Multifaceted approach
(d) Some sampling limitations

vi) Strain found
(1) DENV-1
(2) Related to virus found in a 2007 outbreak in Mexico

vii) Outreach and education
(1) Health Department outreach and education
(2) Mosquito Control worked with health department to reduce breeding in the area

f) Outbreak is continuing in Key West in 2010
g) What about Georgia?
i) Do we get international dengue cases – yes
ii) Do we have a suitable climate – in many areas
iii) What about the vectors?
(1) Very little transmission is associated with *Ae albopictus*
(a) Hawaii 2001-2002
(b) http://www.denguevirusnet.com/aedes-albopictus.html
(c) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2876112/
(2) *Ae aegypti* is mostly gone from Georgia

2) Darkling Beetles and Salmonella – Whitney Boozer
a) Darkling beetle – litter beetle
i) Larvae – lesser mealworm
ii) Females lay between 200 and 400 eggs
iii) Eggs hatch in 4-7 days
iv) Complete lifecycle take 30-40 days
b) Problem in poultry production
i) Biggest problem in broiler facilities
(1) Birds used for meat production
(2) Houses are very large
(3) Birds are free roaming in the building
(4) Dirt floors covered with wood shavings
(5) Grow out period is ~8 weeks
(6) Clean out period
(a) Partial ~21 days
(b) Full once a year
ii) Has become a nuisance outside broiler facilities
(1) Litter from chicken house applied to agricultural fields
(2) Adults emerge and fly to neighborhoods
iii) Hard to control
iv) Larvae cause damage to buildings by borrowing
v) Birds will feed on larvae and can contract disease
c) Disease issue
i) Know vectors and reserves for a number of diseases
ii) Salmonella
(1) Larval beetles are preferred food of chicks
(2) Salmonella contamination in one study was ~2.2% (Harein et al, 1972)
(3) Salmonella was persistent for more than a month in larvae
(4) Some studies
(a) http://www.entsoc.org/pubs/periodicals/jee/jeetocs/PDF/ec03980060.pdf
(b) http://ps.fass.org/cgi/content/full/88/1/44

(c) http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2876112/

d) Summary
   i) Salmonella is an important cause of foodborne illness
   ii) Darkling beetles and adults can acquire and harbor salmonella
   iii) Proven transmission

3) Cuilicoides Biting Midges and Hemorrhagic Disease of White Tail Deer – Mark Ruder
   a) Hemorrhagic disease (HD)
      i) Caused by 2 closely related viruses
         (1) EHDV
         (2) BTV
      ii) Outbreaks recorded since late 1800s
      iii) Has occurred annually since the 1970s
      iv) Large outbreak occurred in 2007
         (1) 812 counties
         (2) 31 states
         (3) >65000 deer mortalities reported
   b) How does the virus work?
      i) Virus replicates in endothelial cells
      ii) Damage to blood vessels
      iii) Coagulation system tries to fix problem
      iv) Outcome
         (1) Highly variable
         (2) Acute and chronic
         (3) Subclinical with recovery
   c) Outcomes
      i) Peracute HD
         (1) Rapid spiral to death
         (2) Fever, depression, weakness, decreased activity, death
         (3) Lots of leaking of bodily fluids
      ii) Acute HD
         (1) Rapid but not as rapid
         (2) Similar clinical signs
         (3) Hemorrhage is more obvious
      iii) Chronic HD
         (1) Recover from initial disease
         (2) Weight loss, lameness, emaciation, death
   d) Seasonality and distribution
      i) August to November
      ii) Everywhere in the SE
      iii) An increase in latitude leads to a decrease in disease frequency but an increase in disease severity
   e) Field signs
      i) Dead deer
      ii) Late summer and early fall
      iii) Often associated with waterways
   f) The vector

i) Biting midges
(1) Numbers can be very large
(2) Tenacious biters
(3) Order Diptera, Family Ceratopogonidae
(a) 1200 species worldwide (http://www.inhs.illinois.edu/research/FLYTREE/CeratopogonidaeCatalog.pdf)
(b) <1% are proven vectors
(c) 1-3 mm
(d) Common name – punkies or no-see-ums
(e) Life history (http://entnemdept.ufl.edu/creatures/aquatic/biting_midges.htm)
(i) Adults emerge late spring-early summer
(ii) Developmental time is variable
1. Eggs hatch between 2-10 days
2. Larvae are found in damp organic locations
3. 4 larval instars

ii) Study
(1) Looking at the effect of temperature on the virus replication
(2) Looking at the effects of temperature on the midge life cycle

4) After the Floods: Response in Cobb & Douglas Counties – Chris Hutcheson
a) What happened?
i) Mid-September
(1) 9 days of continuous rain
(2) Sept 20-22
(a) Concentrated rainfall
(b) >24" in 48 hours

ii) Outcome
(1) Interstates washed out
(2) Flash flooding
(3) Extremely high water
(4) Same general area was flooded by Hurricane Dennis in 2005
(5) Cobb County
(a) Austell: >700 homes damaged (~40%)
(b) Powder Springs: 92 homes damaged

(6) Douglas County
(a) Widespread flooding
(b) 140 roads and 13 bridges out of service
(c) 256 properties damaged

(7) A lot of people and businesses were affected

iii) Peak gage heights
(1) Sweetwater Creek – 30.8 ft
(2) Dog Creek – 33.8 ft
(3) Chattahoochee River

b) Environmental health – Emergency Response

i) EH Emergency Response Plan - http://ema.cobbcountyga.gov/downloads/public_eop.pdf
ii) Initial response
    (1) Shelters were opened
        (a) EH has the duty to ok the opening of shelters
        (b) Staff limited due to inclement weather
        (c) Available staff were inexperienced with shelter inspection
        (d) LESSON: it is never too late for some on the job training
    (2) LESSON #1 – just because the health department is closed doesn't mean you get a day off
        (a) County under a boil water advisory
            (i) Need to get in touch with restaurants
            (ii) Need to close those with unsafe conditions
    (3) LESSON #2 – if need to get the info out quickly, technology can help
        (a) Blast email
        (b) Post on web site
        (c) Call Center
            (i) Call lists
            (ii) Screening tools
        (d) Field staff made site visits
    (4) Issues with mixed message
    (5) LESSON #3 – during certain situations it is ok to give your cell phone number out to lots of people
        (a) Need for a contact person
        (b) When you are the boss…
iii) Continuing process
    (1) Daily calls to water authority to determine water status
    (2) Daily shelter inspections
    (3) LESSON #4 – it is ok to ask for help
        (a) State EH office responded
        (b) Volunteer help from neighboring county
iv) DRC opened
    (1) Must be staffed continually (open 11 hours a day)
    (2) Provide handouts, advice, and empathy
    (3) Started as a public health response
    (4) Became an environmental health response
    (5) LESSON #5 – when the volunteer spirit flags, make a schedule

c) Next big problem
i) Mold
    (1) Large number of calls
    (2) Offer cleanup and safety info
ii) Media
    (1) Your Public Information Officer is your friend
    (2) Be sure to have a point person
    (3) Stay on message
iii) LESSON #6 – some issues are more than EHS can handle alone

(1) Problem
(a) Trailer park
(b) Sick children
(c) No running water
(d) Trailer park staff not really helpful
(e) Angry mob formed
(2) Had to do something quickly – building code condemned trailers
(3) People taken to shelters
iv) LESSON #7 – just because you did something before doesn't mean you have to do it again
(1) Hurricane Dennis (July) – huge response
(a) Door-to-door
(b) Handed out info
(c) Applied larvicide
(2) Sept 2009 flood
(a) Mosquitoes waning
(b) Utilized WNV staff to do complaint-driven larvicide
(c) Lots of education

d) The follow-up
i) Things went back to normal
ii) Still lots of abandoned house
iii) Still potential for mosquito breeding
iv) Recovery continues

e) Mosquito surveillance 2010
i) WNV+
(1) Human
(2) Horse
(3) 2 birds
(4) 2 mosquito pools
ii) 180 mosquito-related complaints (about normal)

5) INDUSTRY SPOTLIGHT
a) Electronic Data Solutions (http://www.elecdata.com/sentinel/sentinel.html)
i) Sentinel GIS
ii) Doing webinars to show aspects of the product (http://www.elecdata.com/webinars.html)
b) Sell through UNIVAR

6) NPDES Permitting in Georgia – Sam Sampath
a) Regional permitting coordinator – EPA
b) Some useful websites
i) http://cfpub.epa.gov/npdes/
ii) http://cfpub.epa.gov/npdes/home.cfm?program_id=410
c) Background
i) This NPDES permit is odd in that the State EPD can apparently make the permit less strenuous than the EPA permit
ii) CWA
(1) 2006 EPA rule

(a) Pesticides are point source pollutants
(b) FIFRA was determined to be sufficient protection
(2) July 2009 – judge vacated this rule

d) Contents
   i) NOI
      (1) Identify pest problem
      (2) Assess alternative controls
      (3) Follow label
   ii) Effluent Limits
      (1) Technology-based
         (a) FIFRA
         (b) BMPs, not numeric limits
         (c) Minimize discharge
            (i) Lowest effective amount of pesticide
            (ii) Perform regular maintenance
            (iii) Clean, calibrate, repair equipment
      (2) Water quality-based
         (a) FIFRA
         (b) Additional permit conditions
   iii) Site monitoring
      (1) Visual monitoring for adverse effects
      (2) Monitoring of management practices
   iv) Pesticide discharge management plan
   v) Corrective action
   vi) Record keeping
   vii) Annual reporting
e) Who has to file an NOI?
   i) Exceed currently unknown application threshold
   ii) Person who files is the decision maker
f) Pesticide General Permit requirements
   i) Different process depending on if you exceed or do not exceed the NOI threshold
   ii) Have to meet water quality limits
g) Still a number of issues to be resolved
h) Bottom line – we have no choice
   i) Still need a permit from EPA
   ii) Next step is for GA EPD to draft a permit
   iii) April 2011 deadline

<u>BUSINESS SESSION</u>

1) New Board
   a) President: Bobby Moulis
   b) Vice-President: Ben Brewer
   c) Directors
      i) 1-year: Fred Koehle

ii) 2-year: Ian Brown
iii) 3-year: Alan Gaines

d) Secretary/Treasurer: Robert Seamans
e) Commercial Rep: Larry Motes
f) Cooperative Extension Rep: Elmer Gray
g) Public Health Rep: Rosmarie Kelly

2) Current membership - 69
3) Participants
   a) 2010 – 42
   b) 2009 – 65
4) Sustaining members
   a) 2010 – 10
   b) 2009 – 12
5) Available funds ~$9,000