



Poultry Health Systems, Food Safety and Security

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- Poultry Health Diagnostics
 - Disease testing and management
 - Avian influenza national model
- Food Safety and Security
 - Pathogenic bacteria, viruses, protozoa
 - Toxicology
- Training, Education, Certification Programs
 - One Health Initiative



**DELMARVA
PENINSULA**

**WORRILOW HALL
AND
CHARLES C. ALLEN
LABORATORY -
NEWARK**

**LASHER
LABORATORY
GEORGETOWN**



Lasher Laboratory (BSL-2)



Allen Laboratory (BSL-3)



Carvel Research & Education Center



**Townsend & Worrilow Halls
(BSL-2)**

Service and Outreach

- Unbiased Source of Information & Interpretation
- Poultry & Food Producers
- USDA, FDA
- DE, MD, VA State Depts. of Agriculture
- Biologics (Vaccine) Companies
- Consulting Firms
- Public

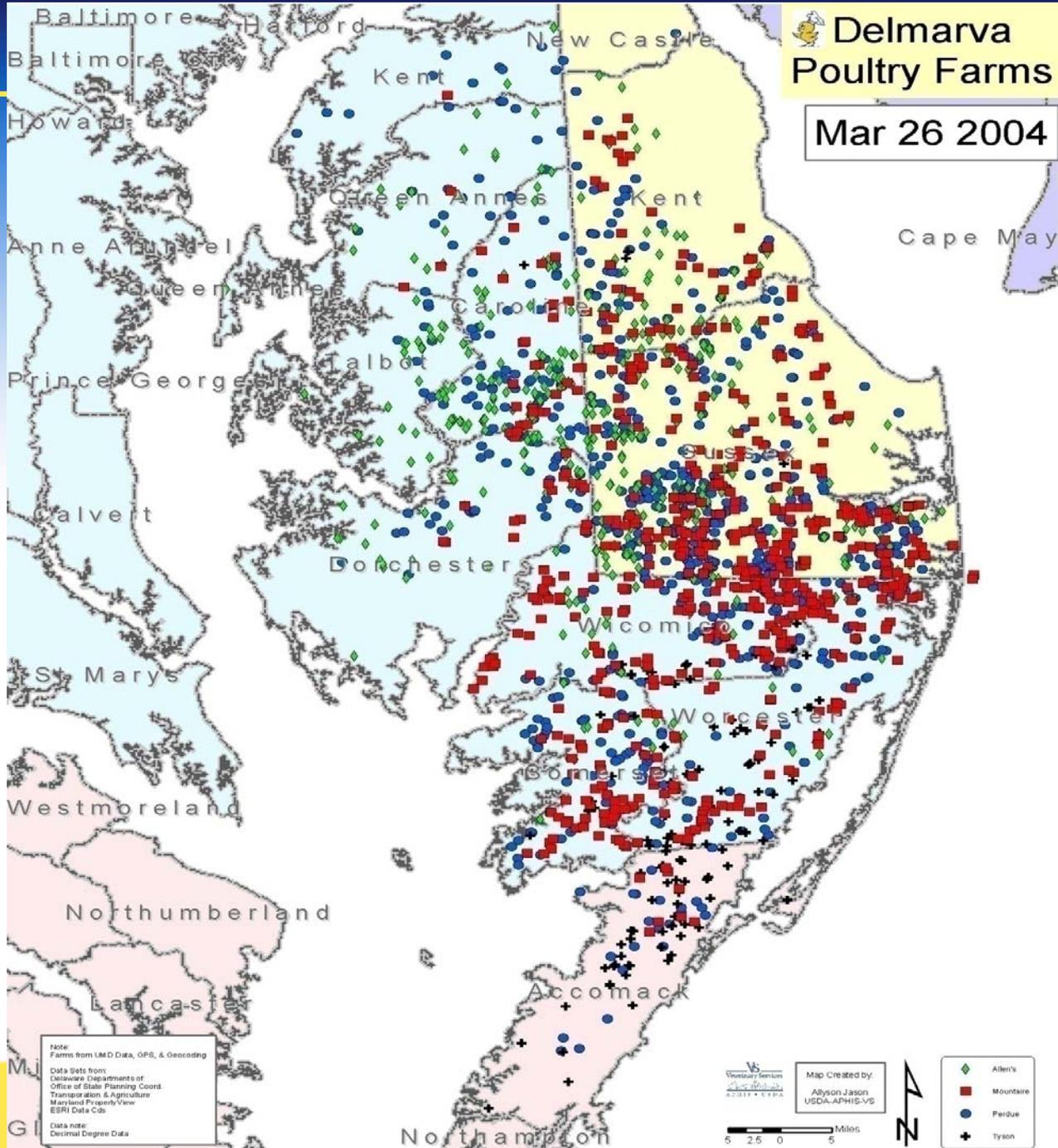
Poultry Disease Research

- **Infectious Laryngotracheitis (ILT)**
- **Avian Influenza (AI)**
- **Marek's Disease**
- **Coccidiosis, Gangrenous Dermatitis**
- **Vaccines**
- **Biosecurity, Emergency Depopulation**
- **Gumboro Disease (IBDV)**
- **Infectious Bronchitis and Newcastle**
- **In-house Litter Composting Pathogen Inactivation**



 Delmarva Poultry Farms

Mar 26 2004



Note:
Farms from LMD Data, OPS, & Geocoding

Data Sets from:
Delaware Department of
Office of State Planning Coord.
Transportation & Agriculture
Maryland Presently View
ESRI Data Cub.

Data note:
Decimal Degree Data



Map Created by:
Allyson Jason
USDA-APHIS-VS



-  Allen's
-  Mountaire
-  Perdue
-  Tyson

Delmarva is a Migratory Bird Stop Over



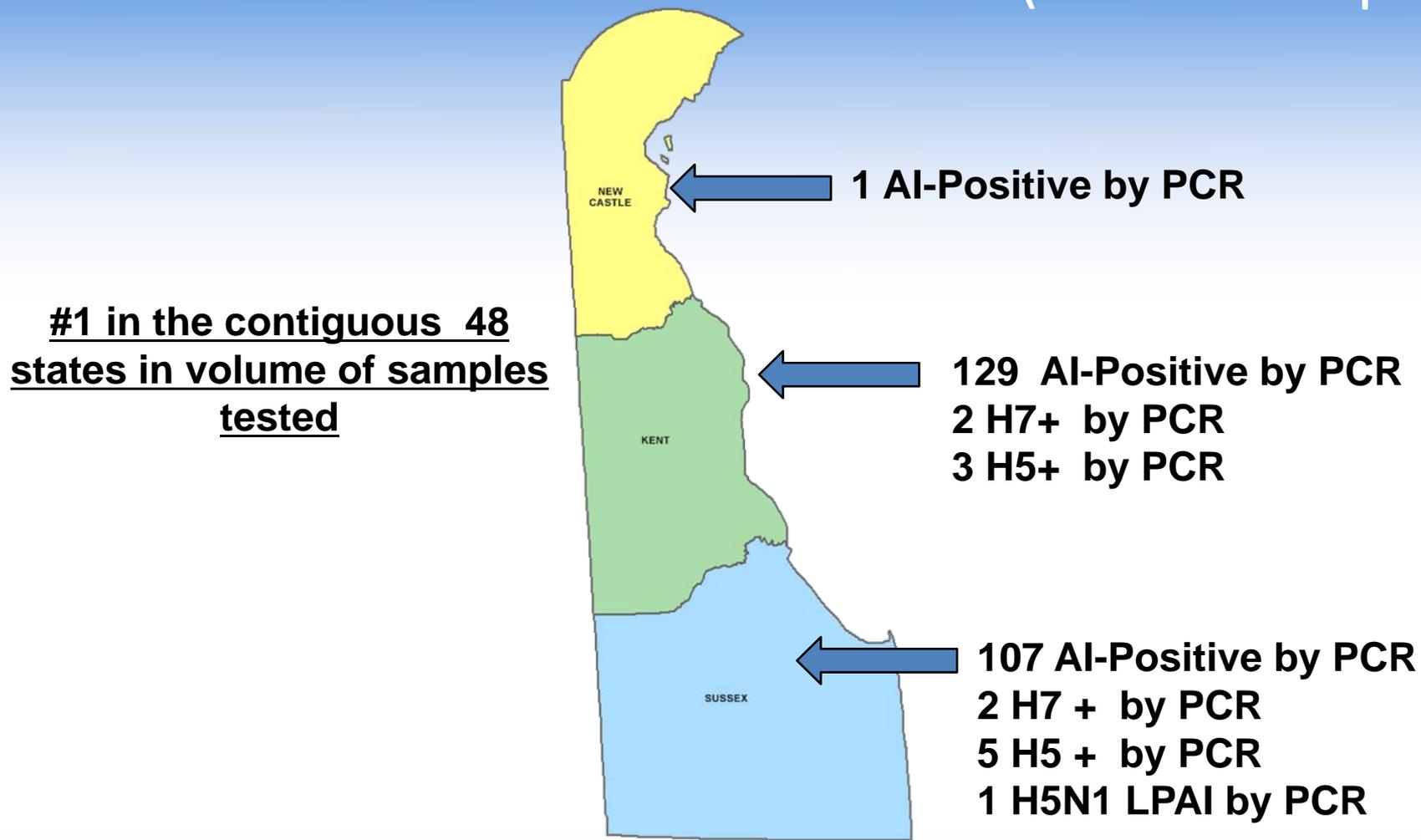
Shorebird Routes

<http://www.vex.net/~hopscotc/shorebirds/en/wasa.html>

Waterfowl Routes

US Fish and Wildlife Service

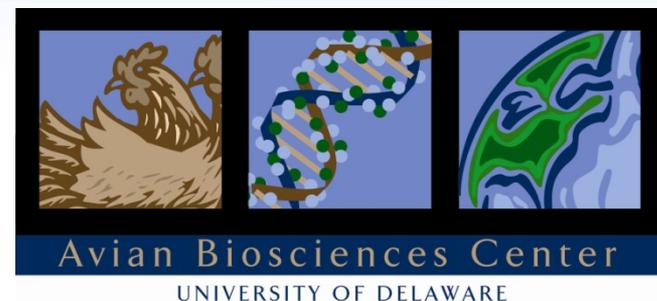
2009 Wild Waterfowl Surveillance (>3000 samples)



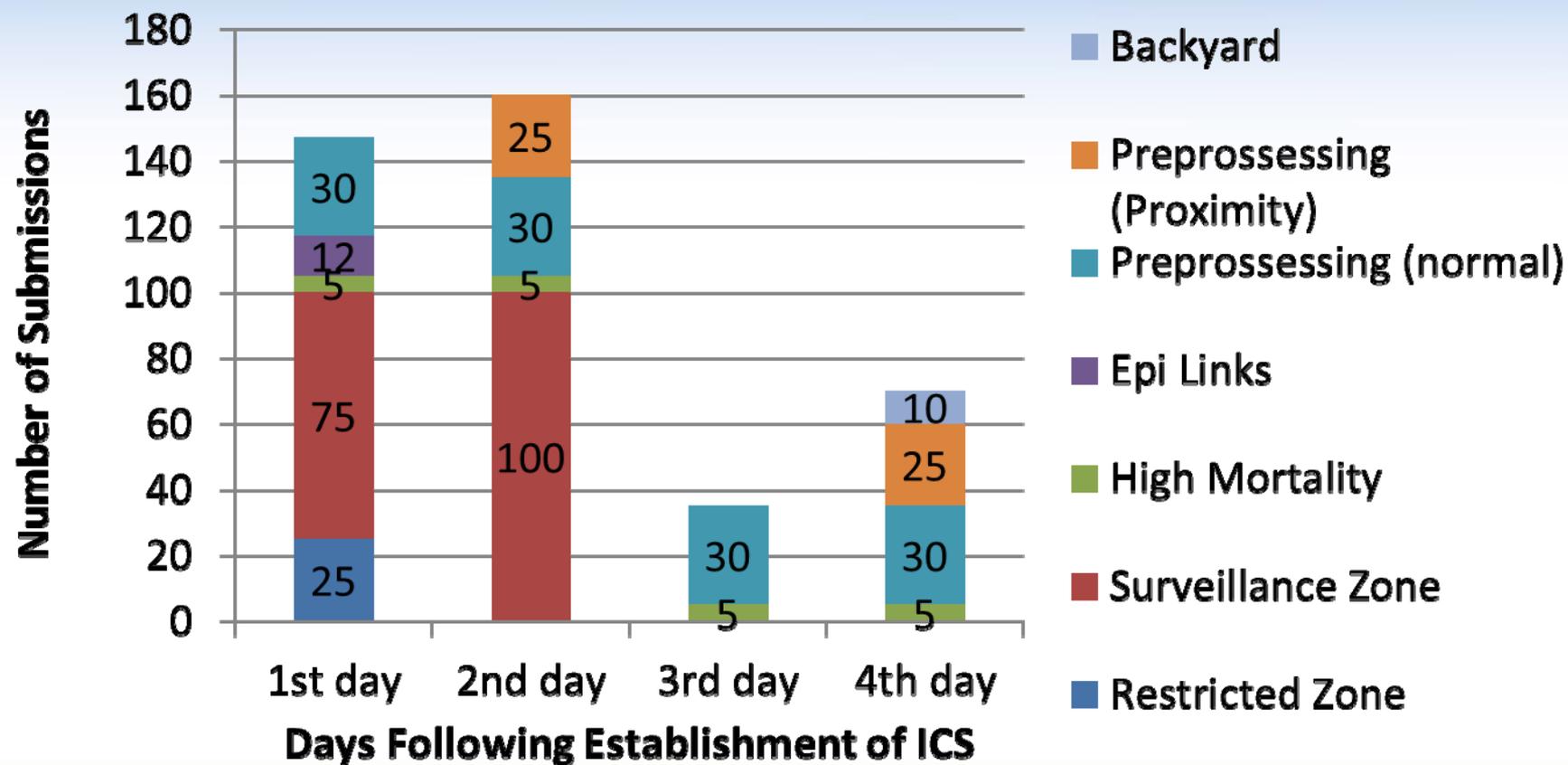
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Delmarva/UD Experience

- AI surveillance in commercial poultry
 - High volume antigen/genome based testing available since 2004
- AI response and control
 - Rapid aggressive decisive “Delmarva model” lead the nation
 - Depopulation and carcass composting research
 - Educational programs taught regionally and internationally via the Avian Biosciences Center



Example of Possible Submission Numbers In An Outbreak



Delmarva Poultry Diagnostic labs: AI testing capacity

Diagnostic lab	BSL	Thermocyclers	Total Samples/ 8hr shift	Total Samples/ 10hr shift
UD Lasher lab	2	96-well ABI 7500 and 16-well Smartcycler	636	912
UD Charles Allen lab	3	96-well ABI 7500 and 16-well Smartcycler	636	912
MD Dep't of Ag Salisbury lab	2	96-well ABI 7500 and 16-well Smartcycler	636	912
Grand total samples			1908	2736

Delmarva/UD Experience

No more AI outbreaks in commercial broilers in Delmarva?

- Complete confinement of commercial broilers
- Segregation from backyard and wild birds
- Awareness of the potential role of the live bird market
- Increased biosecurity as a whole
- Waterfowl AI have limited ability to infect chickens

 Transition in testing needs of industry and government

Activity Category	2003	2004	2005	2006	2007	2008	2009
Total Lab Accessions	2704	3914	5940	9640	7844	8456	8617
Necropsy cases (flocks)	296	620	987	1000	1095	1390	1114
Avian Influenza Tests	0	1224	1621	4332	3879	3699	3718
Breeder ELISA	1303	2439	2874	1969	1869	1644	2013
Food Safety Testing (Processing Plant)	176	0	0	259	599	1195	2085
Food Safety Testing (Live Production)	410	728	893	873	402	585	796
Gumboro Dz Testing	13 K	8K	20K	16 K	13K	13K	14K

Lasher Lab adopted the AI RRT-PCR test in 2003 and was instrumental in the early detection and field surveillance of the H7N2 LPAI outbreak in 2004.

This lab w/ only 5 full-time staff and 1 vet is the backbone of commercial AI surveillance in Delmarva.

Food Safety Testing

- Integral part of research, teaching, extension
 - Undergraduate & Graduate students
 - Growers and Producers
- Environmental microbiology
- Process microbiology
- Rapid and conventional methodology





High-Throughput RRT-PCR Equipment



Applied Biosystems 7500 Fast Thermocycler



Automated Liquid Handling System

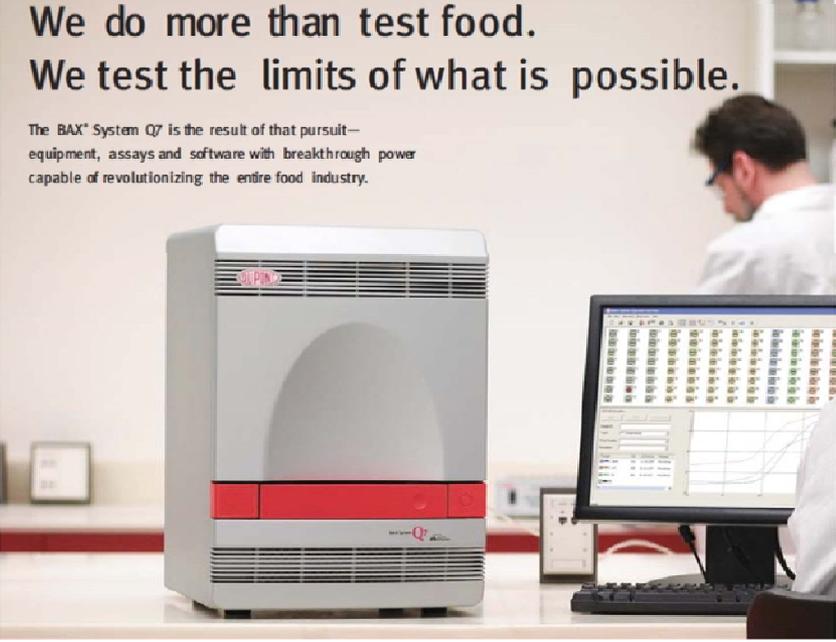


Magnetic Bead Extraction Robot

Food and Feed Safety Testing

We do more than test food.
We test the limits of what is possible.

The BAX® System Q7 is the result of that pursuit—
equipment, assays and software with breakthrough power
capable of revolutionizing the entire food industry.



➔ BAX® System

Campylobacter

E. coli O157:H7 real-time

E. coli O157:H7 MP

E. coli O157:H7

Enterobacter sakazakii

Listeria assays

Salmonella

Staphylococcus aureus

Vibrio

Yeast and Mold

**DuPont Bax Qualicon and Life Technologies PCR tests for Food Safety Pathogens
both use the Applied Biosystems 7500 Fast Thermocycler Platform**

In summary...

- Take stakeholder interests seriously
- Leaders in poultry diagnostic testing
- Team approach to food safety testing
 - Rapid methods, conventional culture techniques, chromatography
- Looking forward to future collaborations

Dare to be first.

