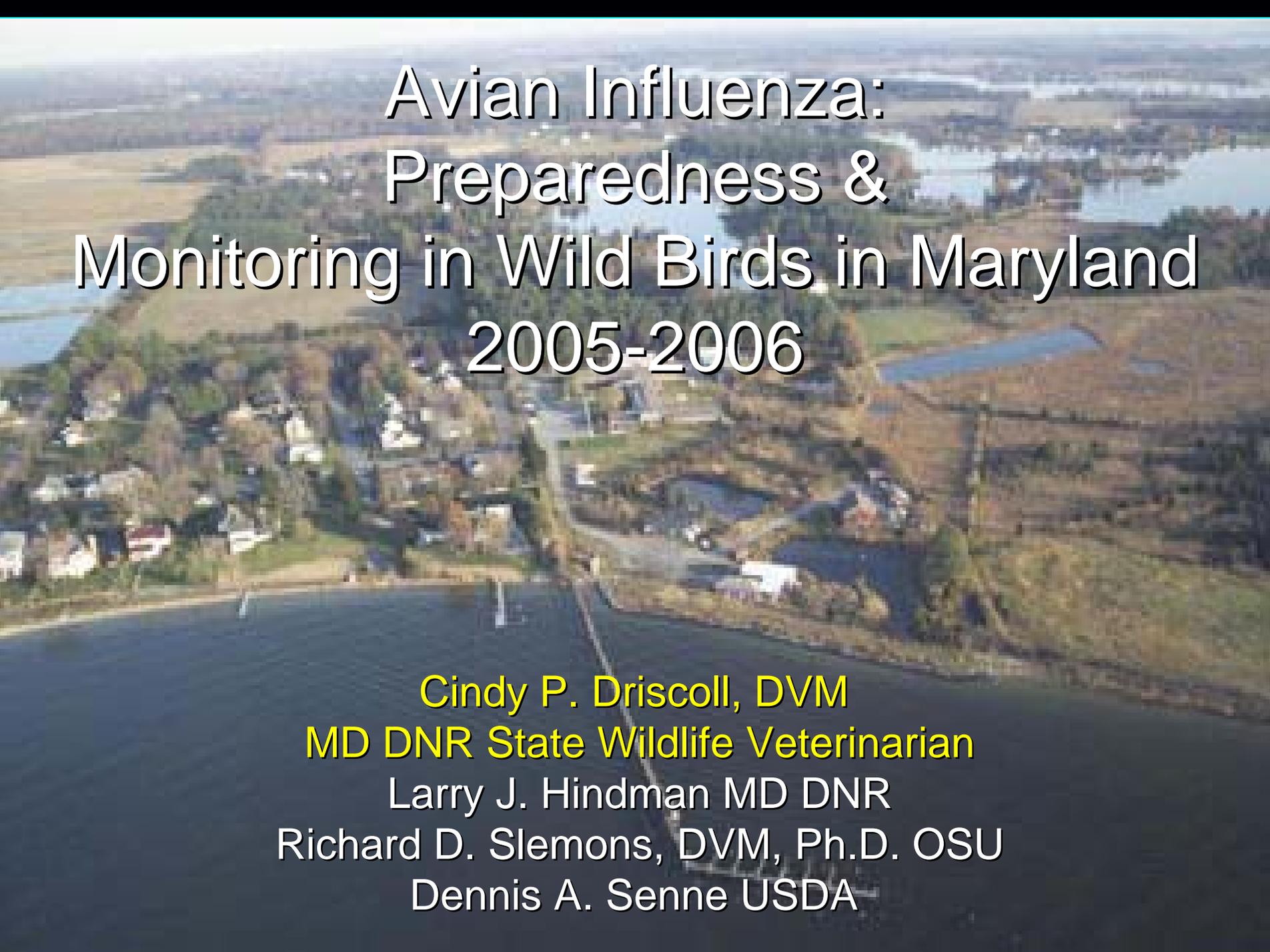


Arthur Hughes:





Avian Influenza: Preparedness & Monitoring in Wild Birds in Maryland 2005-2006

Cindy P. Driscoll, DVM
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Dennis A. Senne USDA



Hunting
● CUMBERLAND

HAGERSTOWN

WESTMINSTER

HAVRE DE GRACE

FREDERICK

BALTIMORE

ROCKVILLE

ANNAPOLIS

WASHINGTON
D.C.

LA PLATA

LEONARDTOWN

CAMBRIDGE

SALISBURY

OCEAN CITY

CRISFIELD

Greetings From
MARYLAND

State Flower
Black-eyed Susan

State Bird
Baltimore Oriole

Yacht Racing Off
Oxford Shore

HA-NA Combinations by Host

Humans **H1N1, H2N2, H3N2**
(Since 1997: H5N1, H7N2, H7N7, H7N3, H9N2)

Swine **H1N1, H3N2, H1N2**
(H3N1, H4N6, H5N1, H9N2)

Equine **(H7N7), H3N8**

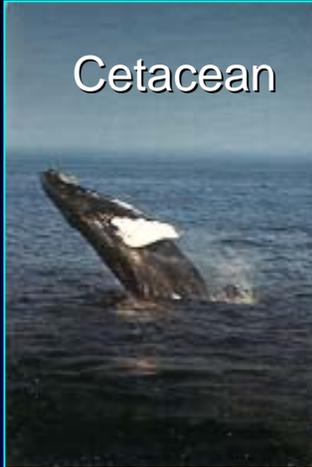
→ Marine Mammal **Cetaceans: H13N9, H13N2, H1N3**
Pinnipeds: H7N7, H4N5, H4N6, H3N3

Poultry **Many HA-NA combinations recovered**
Not all HA and NA subtypes recovered

→ Wild birds **Numerous HA-NA combinations recovered**
All HA and NA subtypes recovered

Fin Whale Necropsy

Cetacean



Stranding Network Members – at risk?

Pinniped

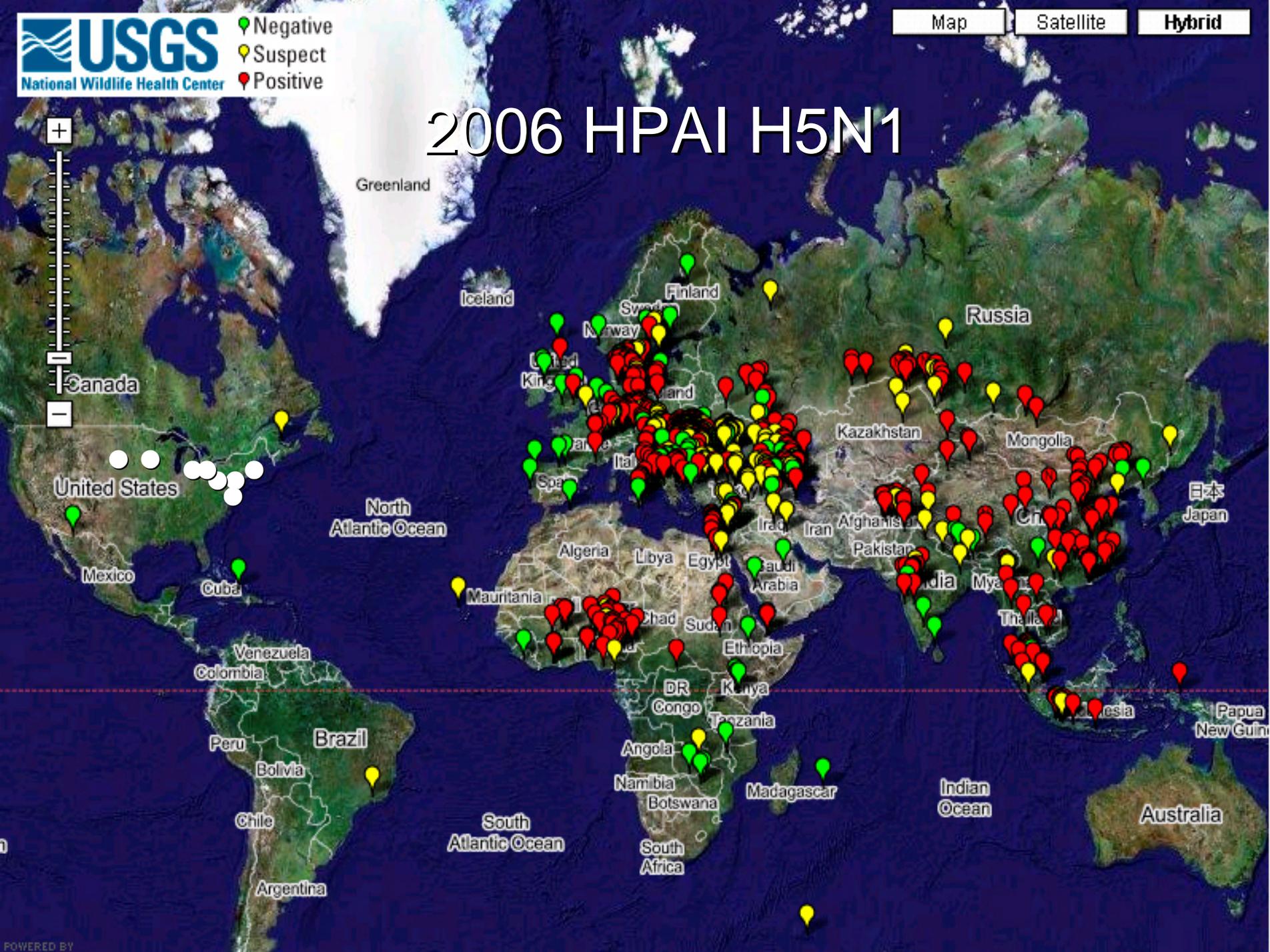


Wild Bird Reservoirs & Migratory Routes

Avian Reservoirs: Shorebirds & Waterfowl



2006 HPAI H5N1

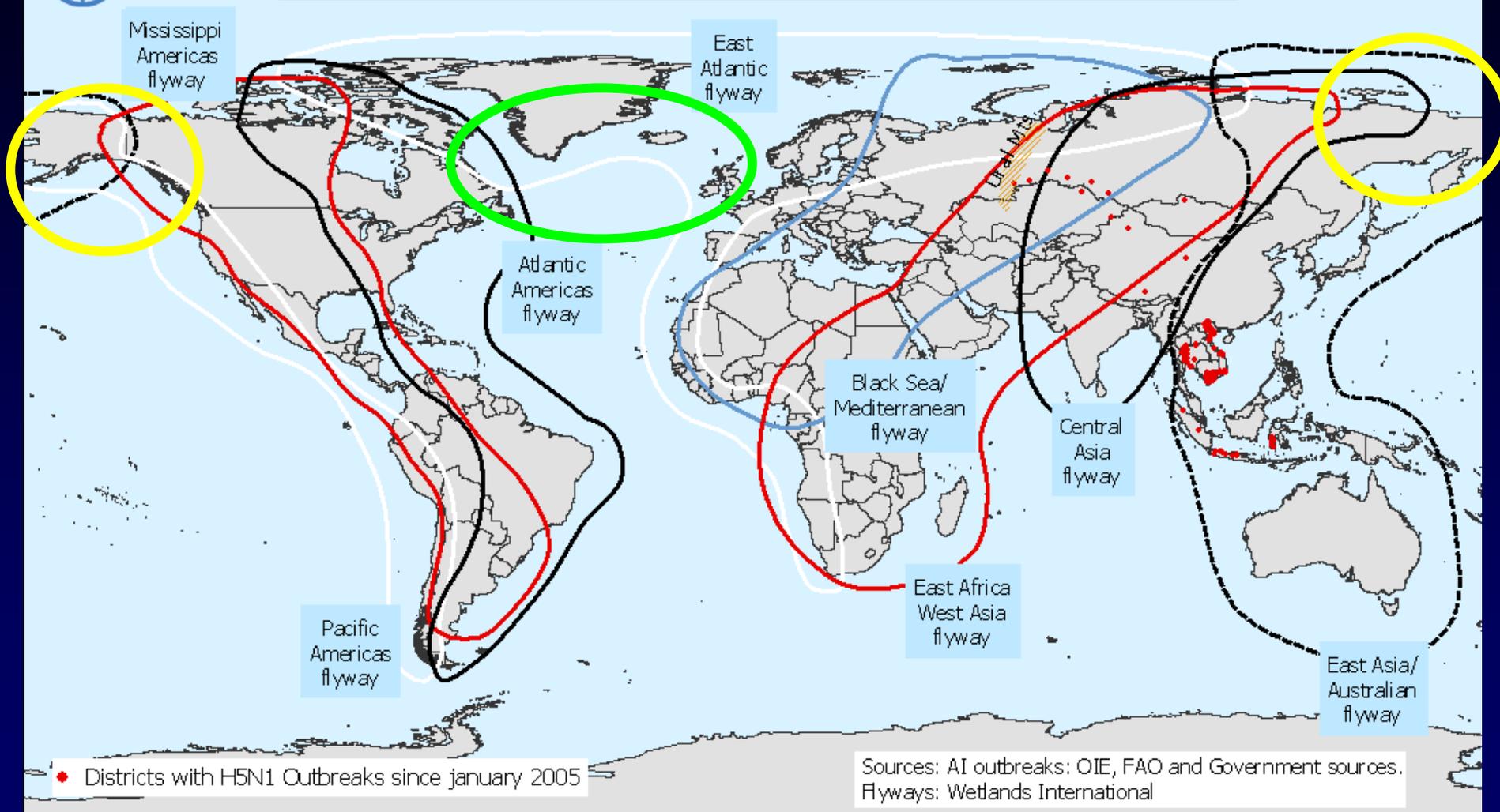


Major Waterfowl Flyways



Overlap between the S of Flyways and Asian & European Flyways

Situation on 30 August 2005



Intercontinental Migrations

▪ Atlantic Flyway

- 9 species have significant European contact (CWS)
- >5 species move between Canada - Greenland
- US Fish and Wildlife Service analysis in progress

▪ Pacific Flyway

- 146 species are covered in Russia/Japan/US Treaty
- 32 are migratory or more numerous than casuals (AK-FWS)

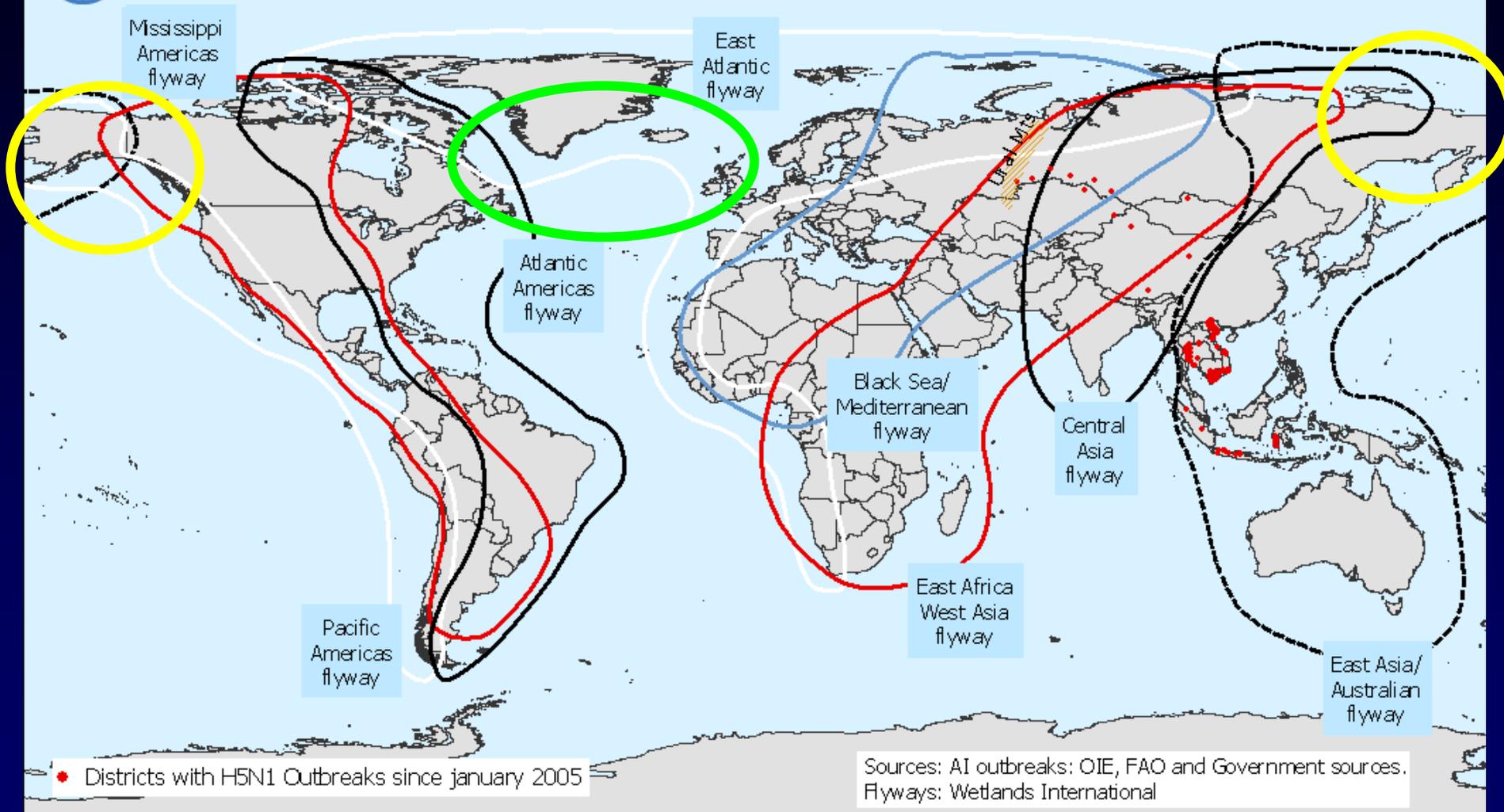


Major Waterfowl Flyways



No H5N1 positives in 20 years of wild bird migrations

Situation on 30 August 2005



Routes of Introduction to North America

Smuggled / illegal imports of poultry products:

2005 – 2 month period:

– 165,000 pounds illegal poultry products entered the U.S [en route to LBM]

–September 2005

- **California:** 820 cases of eggs (120 eggs each) on ship, no permits, not listed on manifest (USDA-APHIS)
- **New York:** poultry labeled as *lily flowers & prunes*



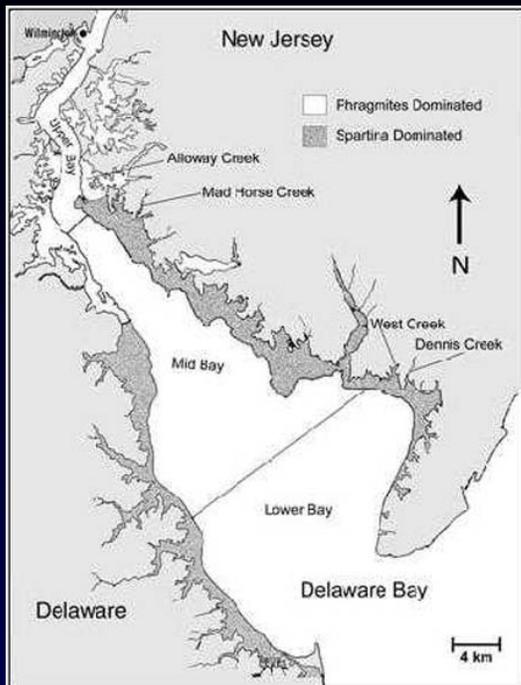
–October-November 2005

- Port Elizabeth, NJ; ship: 27,000 lbs poultry
- Brooklyn, NY; ship: 30,000 lbs preserved duck eggs
- Philadelphia, PA; warehouse: 3,000 lbs squab, goose parts
- Chicago, Il; restaurants: squab and goose parts
- Chicago, Il; grocery store: chicken and duck feet



Wild Bird AI Monitoring
and Surveillance &
Early Detection of H5N1

AIV isolations DE Bay 2000-2002

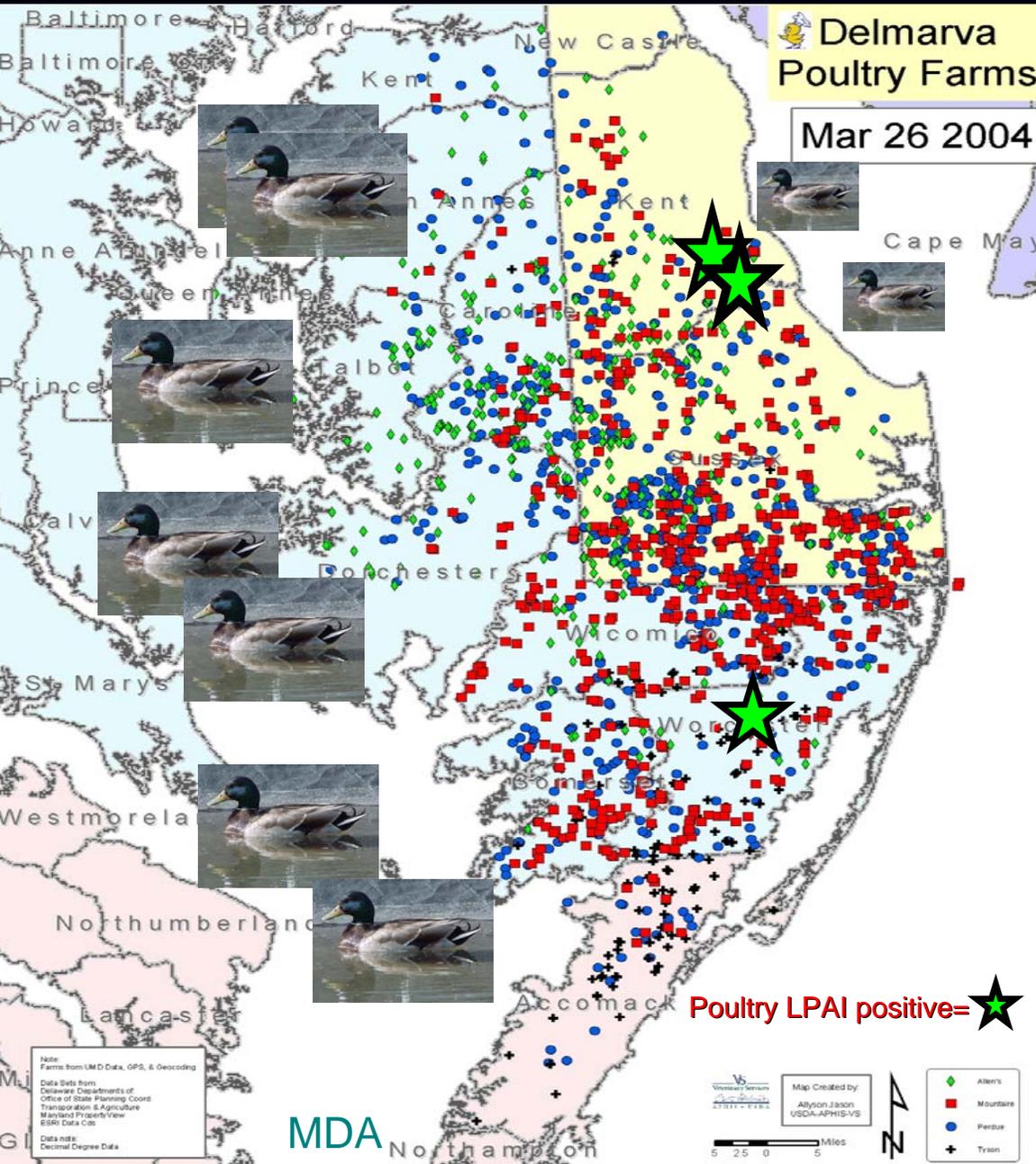


Dunlin
Red Knot
Sanderling
Semipalmated sandpiper
Ruddy turnstone
150 AIV isolates



HA subtype	Number isolations	%
H2	34	23%
H4	1	<1%
H5	3	2%
H6	10	7%
H7	2	1%
H9	12	8%
H10	40	27%
H11	31	21%
H12	17	11%

Chesapeake Bay – Home to highest wintering waterfowl concentration on East Coast



Extremely high density of poultry farms



MDA is equipped with RRT-PCR to test for AI and END [one unit supplied by MD DNR through DHMH DHS grant]



Surveillance Efforts 2000-2006

➤ AI Collaboration with Dr. Richard Slemons, Ohio State University since 2000

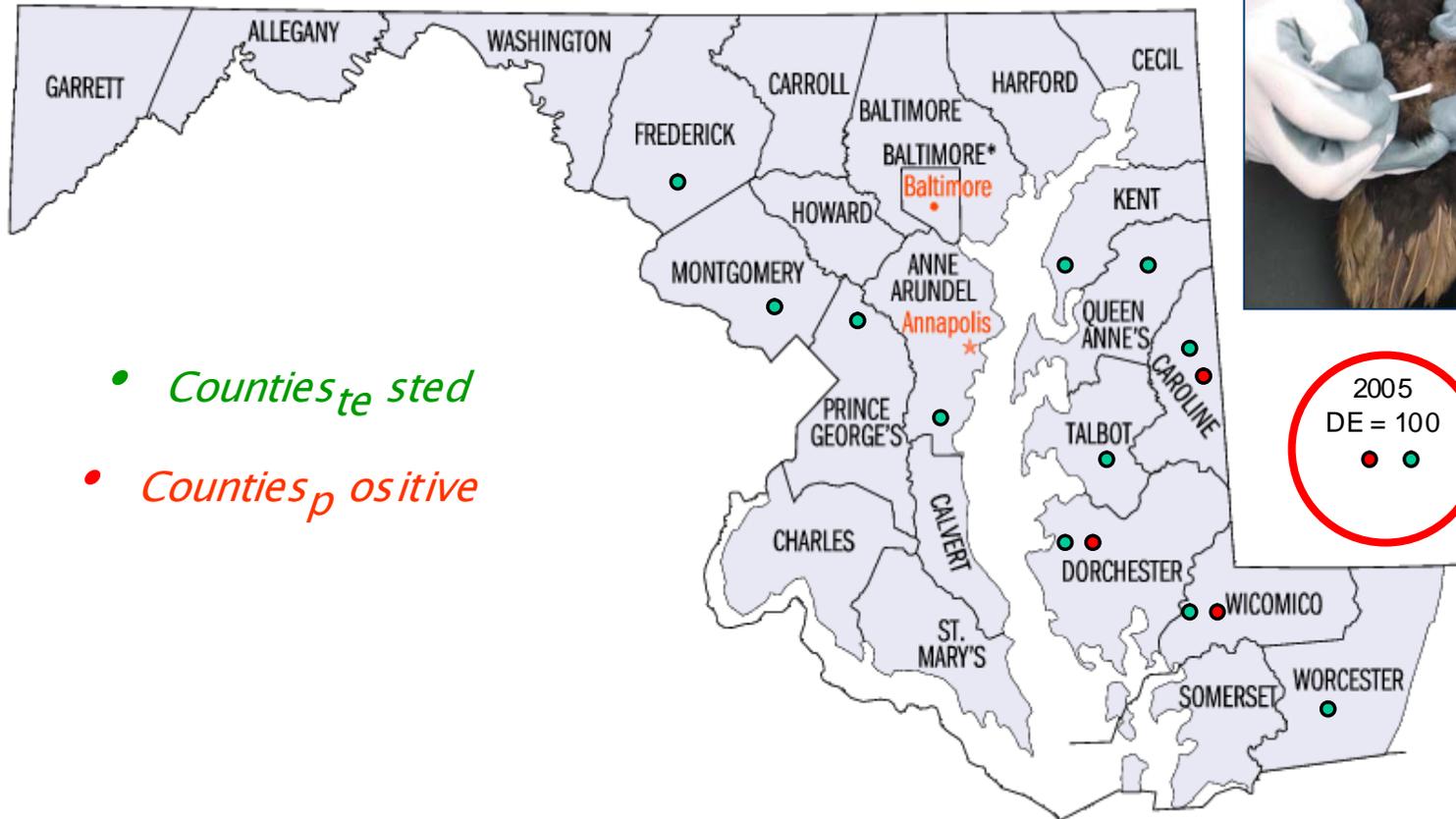
- ✓ Mallards; environmental sampling of ponds

➤ MD DNR **pro-active surveillance** in wild birds began Summer 2005 (targeted and opportunistic surveillance – ongoing)

- ✓ Mainly waterfowl, also some colonial waterbirds, other birds
 - Live sampling & banding; hunter cooperative sampling
- ✓ To date over 1000 samples collected
 - No HPAI detected
 - Several LPAI strains documented
 - Species include: S. geese, C. Scoters, W.W. Scoters, L.T. Ducks

➤ Following national surveillance guidance [USFWS, AFWA, USDA, USGS]

2005 – 2006 MD DNR AI Sampling Counties Tested and Location of Positives



• *Counties tested*

• *Counties positive*



2005
DE = 100
• •

LPAI Surveillance in Maryland: 2005



MD Species Tested for AI: 2005

SPECIES

Hunter Killed Waterfowl

→ SNGO	RUDU
→ LTDU	ABDU
→ WWSC	MALL
→ COSC	NOPI
CAGO	GADW
MUSW	SCAU

Live Captured Birds

BRPE
CAGO
WODU
ABDU
MALL

*CAGO 133 tested (all sources) – all negative

2005 Total all species = 514 (457 WF; 57 other)

SPECIES

WL Rehabilitator &

Captive Birds

CAGO	WWSC
BLDU	LTDU
GBHE	SUSC
GHOW	GBHE
BAEA	
OSPR	
RTHA	
GBHE	
PEFA	
BCNH	

Waterfowl biologists at risk?



MD Species Tested for AI: 2006

SPECIES

Hunter Killed Waterfowl

SNGO	RUDU
LTDU	ABDU
WWSC	MALL
COSC	NOPI
CAGO	GADW
MUSW	SCAU
CBDU	BUHD
→ AGWT	CBDU
→ BWTE	NOSH
SUSC	

Live Captured Birds

Round-up banding

CAGO = 140

SPECIES

WL Rehabilitator & Captive Birds

CAGO	WWSC
BLDU	LTDU
GBHE	SUSC
GHOW	GBHE
BAEA	
OSPR	
RTHA	
GBHE	
PEFA	
BCNH	

Mist-net banding

Shorebirds: Sandpipers; yellowlegs = 30

Misc

*CAGO 140 tested (all sources) – all negative

2006 - Total all species = 610 (438 WF; 172 other)

LPAI Positive in Maryland: 2005-2006

<u>SPECIES</u>	<u>N</u>	<u># +</u>	<u>%</u>	<u>H</u>	<u>N</u>
<u>2005</u>					
Snow Goose	76	7	9	6	1
Long Tail Duck	26	1	13	3	8
		1		?	8
White-wing Scoter	16	1	6		9
→ Common Scoter	4	1	100	11	3
		2		4	8
		1		10	8
Total positives		14			
<u>2006</u>					
BW Teal	5	1	20	being processed	
GW Teal	32	1	3	being processed	
Total positives		2			

2005-2006: 952 Processed 16 Positive 1.5 % = low prevalence

2005 - 2006 LPAI Positive Summary

- Long Tailed Duck H3 N8/ WW Scoter H11 N9
 - only 2nd report from these species (Sinnecker 1983; Europe)
- Common Scoter H3 N8: 1st report from this species
- Snow Geese H6 N1: 1st report for this species

Future Efforts

- Our future surveillance will include waterfowl, gulls, shorebirds
- LPAI viruses still here – have been historically
- Wildlife agencies, agriculture agencies, poultry industry and human health community need to desensitize the public to wild bird AI findings

State of Maryland AI Efforts

To inform state partners, industry, public about AI efforts we developed the following:

- Comprehensive AI ppt presentation on AI in wild birds – for DPI, wildlife rehabilitators, wildlife biologists, SART, State & County Health Departments; IAAAM; AVMA
- Wildlife “AI Q&A” sheet & “What Hunters Should Know” on MD DNR website
- MD DNR AI sampling protocol
- Draft MD DNR AI phone response protocol
- Statewide Wild Bird AI Surveillance Plan with USDA WS & Ohio State Univ.
- *CSTE supported training Fall 2007 for first responders*
- *MD DNR Draft Response Plan for Free-ranging Wild Birds*
 - ❖ *Basic “ring” response, surveillance; no depopulation of free-ranging wild birds*

MD DNR & USDA WS Surveillance Efforts 2005 - 2006



MD DNR, USDA WS, USGS /NWHC New Findings

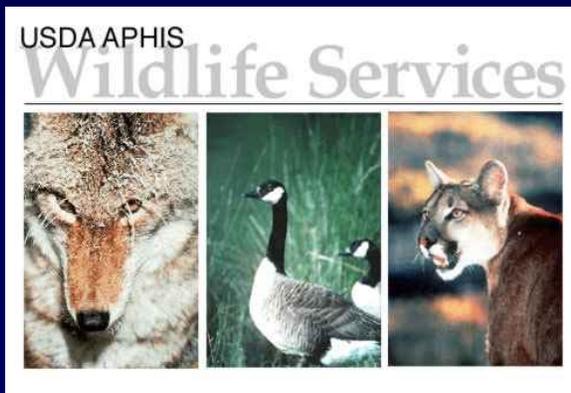
- MD DNR, USDA WS & USGS/ NWHC investigating AI positives in *mammals*
 - Raccoons, nutria, fallow deer
- Anne Arundel County – raccoons positive {Georgia raccoons – negative}
- USDA NVSL conducting subtyping

“Early Detection” USDA WS Asian H5N1 Surveillance in Maryland 2006



DNR Wildlife and Heritage Service

800 samples (live-captured or hunter-harvested)



USDA Wildlife Services

800 samples (live-captured or hunter-harvested) plus 1,000 fecal samples

Live Bird Sampling 2006

Maryland DNR



- 100 Greater Scaup
- 100 Tundra Swan
- 200 Lesser Scaup
- 200 Canvasback



Hunter-harvested Birds Sampling 2006

Maryland DNR

- 100 Long-tailed Duck
- 100 Atlantic Brant



Additional Sampling

- Mute Swan
- Greater Snow Goose
- Wild Mallard
- Resident Canada Goose

LPAI – Fall 2006 Findings

Recent Findings – H5N1 (LPAI)

August 2006

- Michigan: H5N1 (LPAI) detected in wild mute swans

September 2006

- Maryland: H5N1 (LPAI) detected in mallard RSA environmental sampling *RSA = Regulated Shooting Area*
- Western Pennsylvania: H5N1 (LPAI) detected in routine waterfowl surveillance (mallard)
- Second H5N1 (LPAI) detected in mallards in SE Pennsylvania – routine waterfowl surveillance
- Montana: H5N1 (LPAI) detected in a wild northern pintail – routine surveillance
- Many more states positive for LPAI.....

All wild birds sampled were healthy/ normal when examined

Trade embargo: Mexico & Russia ceased trade with U.S. ...now – reported on website only

LPAI H5N1 Historical Documentation

- 1975 – WI – wild mallard duck; wild blue goose
- 1981 & 1985 – MN - sentinel ducks
- 1983 – PA – ring-billed gulls
- 1986 – OH – wild mallard duck
- 2002 – MI – turkeys
- 2005 – Manitoba, Canada – ducks

Due to increased surveillance – more H5N1 is being detected, though the above documentation verifies that H5N1 LPAI has been in North America for decades.

LPAI – National Findings

- USGS – 13,000 birds sampled in 2006
- No HPAI in wild birds - NONE
- Remember – HPAI H5 N1 in Asia since 1997
- Therefore – in 10 years no HPAI through migratory birds to U.S.

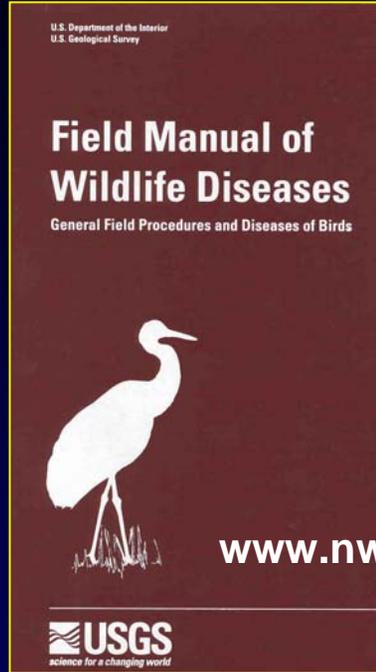
Pandemic Threat ?

■ **Reality Check:**

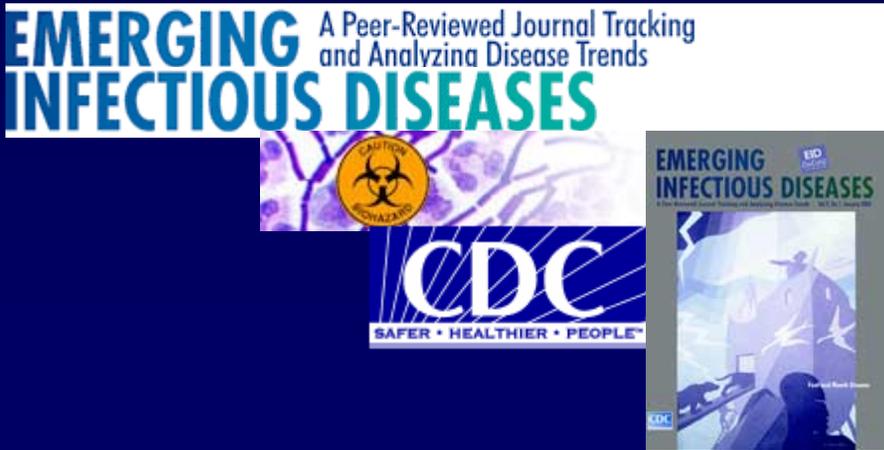
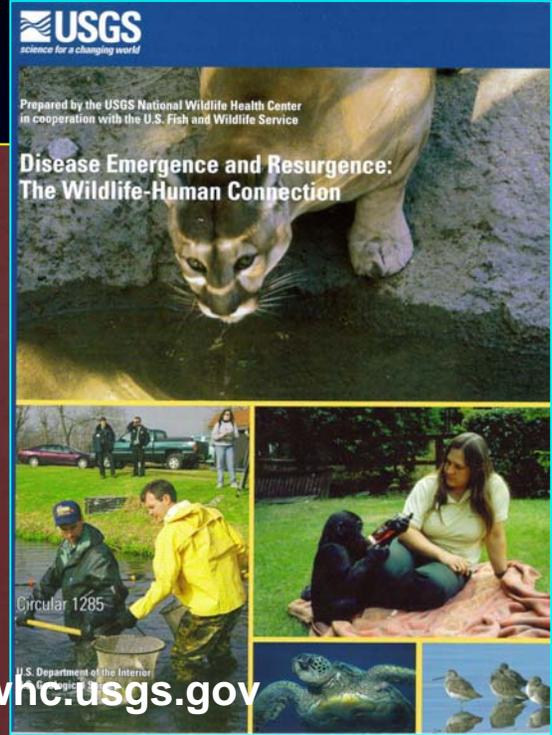
- To date – approximately ~200 people have died from HPAI H5N1 Type A Influenza virus in Eurasia out of the approximately 350 infected **and millions exposed**
- Yearly - U.S. alone over 30,000 people die from the seasonal flu
- Poultry = associated with human deaths in Asia, Africa & Europe; wildlife questionable
- HPAI occurs rarely in the U.S. and has only been associated with poultry (last outbreak – 2004 TX?)
- Wild birds have not spread HPAI to poultry or people in the U.S.....people spread the virus by lapses in biosecurity
- Since 1997 - 10 YEARS – no migratory bird HPAI / H5N1 - transmission to the U.S.

Know Where to Go for Information

www.pandemicflu.org
www.cdc.gov/ncidod/EID
www.cdc.gov
www.nwhc.usgs.gov
www.usda.gov
www.scwds.org
www.fws.gov
www.wda.org
www.avma.org



www.nwhc.usgs.gov



www.scwds.org



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Thanks for Your Attention