

VIRUS GILL DISEASE OF SOFTSHELL CLAMS IN CHESAPEAKE BAY



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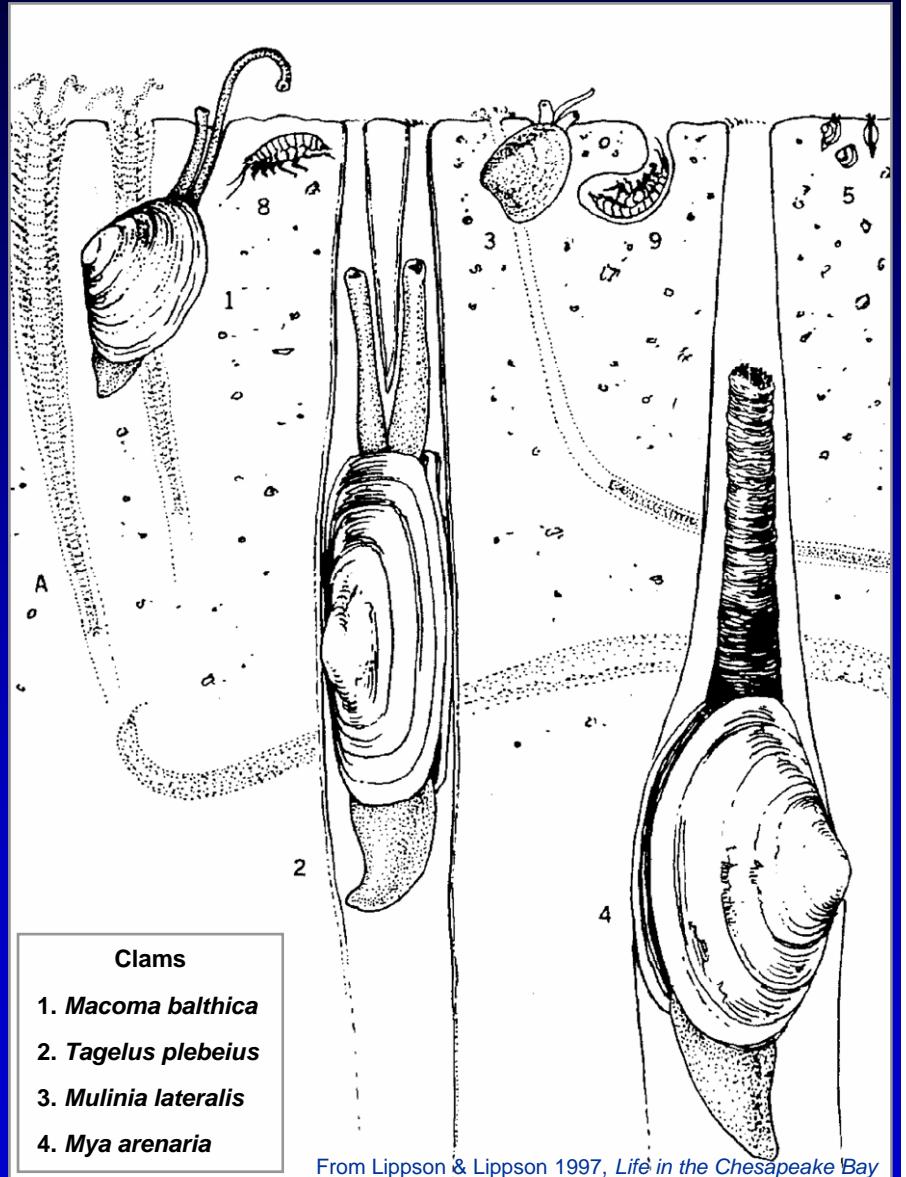
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CHESAPEAKE BAY CLAMS



Clams

1. *Macoma balthica*
2. *Tagelus plebeius*
3. *Mulinia lateralis*
4. *Mya arenaria*

From Lippson & Lippson 1997, *Life in the Chesapeake Bay*

SOFTSHELL CLAM VALUES

Maryland fishery:

- ex-vessel revenues to \$10 million (1989)
- licensed harvest vessels to 150 (1969)

Chesapeake Bay food chain:

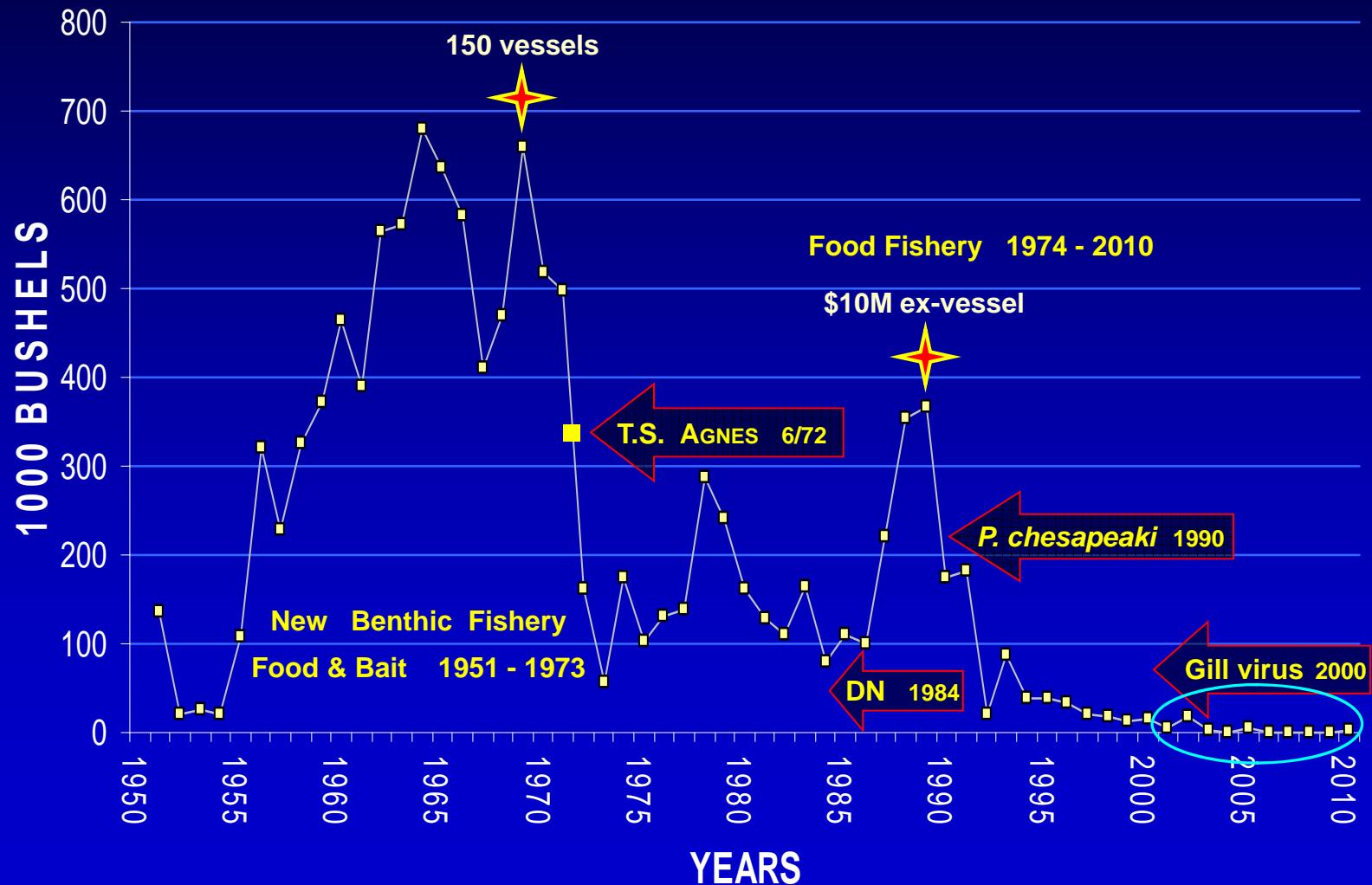
- provide prey for commercial crabs and finfish

Ecological services:

- consume phytoplankton
- convert waste nitrogen and phosphorus to clam biomass
- increase water clarity
- reduce oxygen dead zones

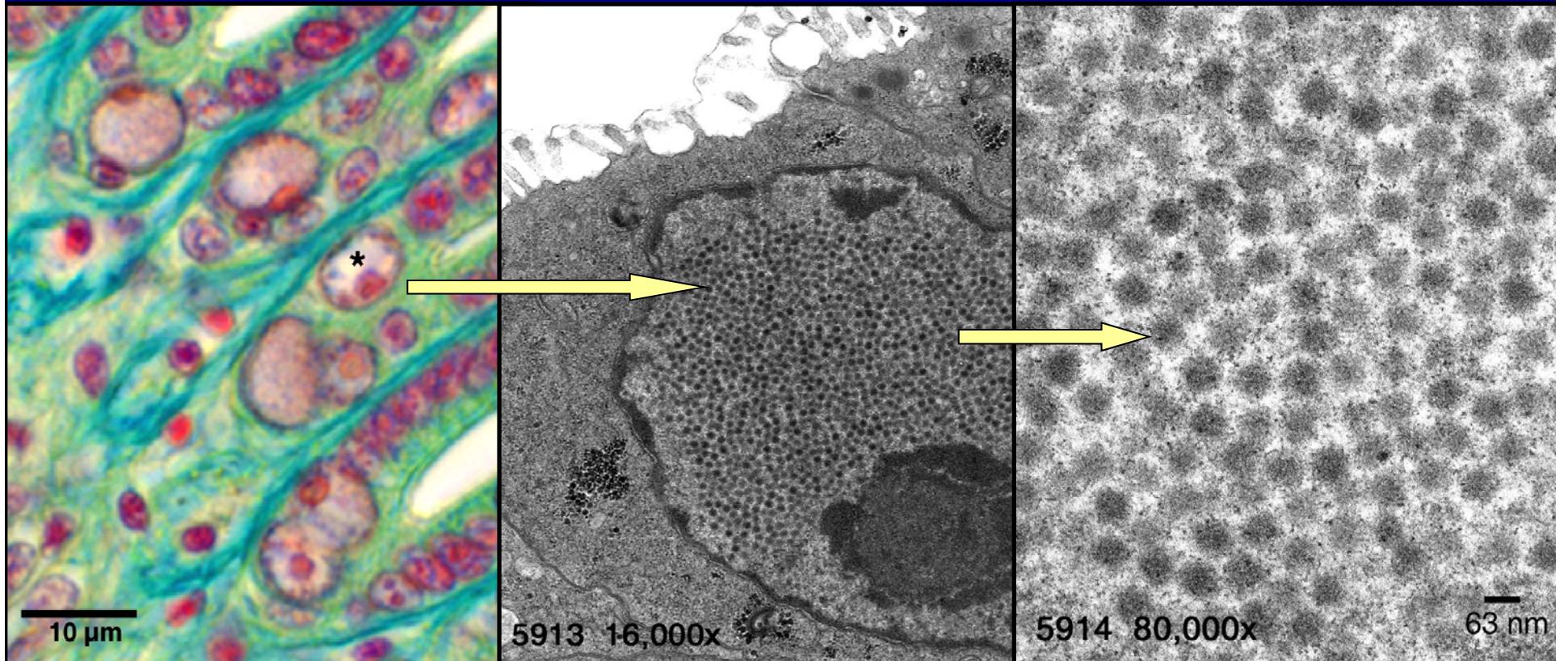
MARYLAND SOFTSHELL CLAM LANDINGS

MYA ARENARIA 1951 - 2010

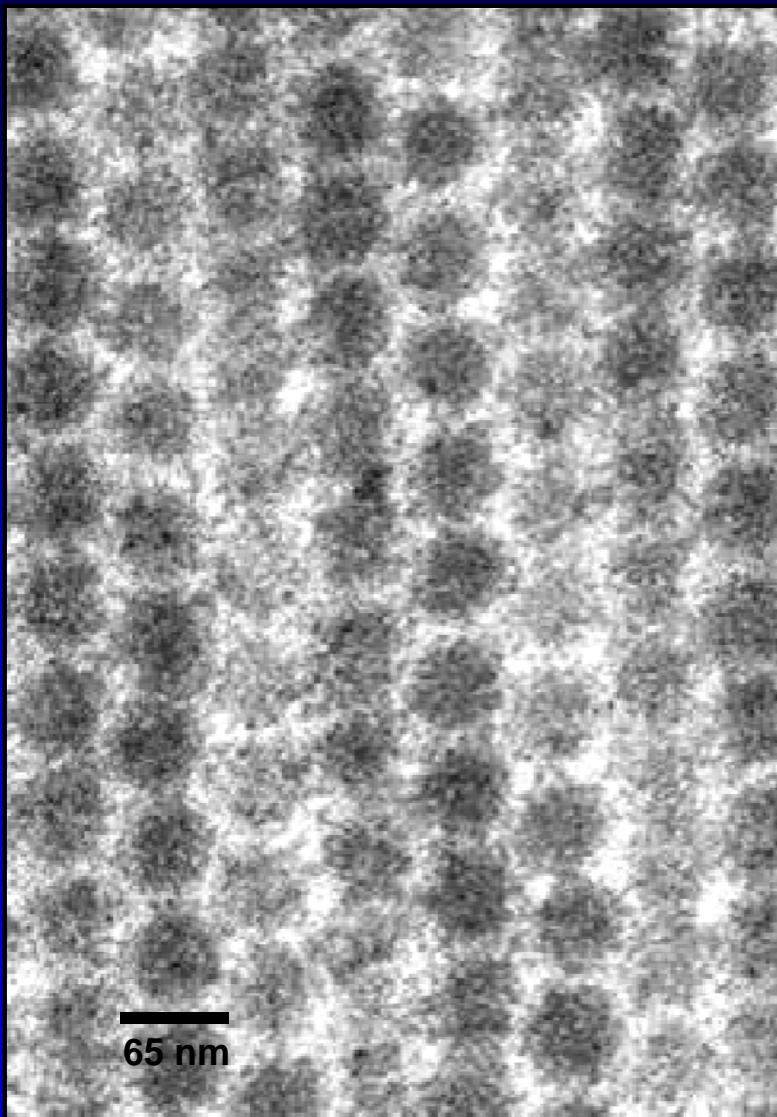


GILL EPITHELIAL CELL NUCLEAR HYPERTROPHY (GENH) VIRUS DISEASE

Gill epithelial cells of Chesapeake Bay softshell clams harbor infections by an unknown nuclear virus at prevalences to 100%.



SOFTSHELL CLAM GILL VIRUS

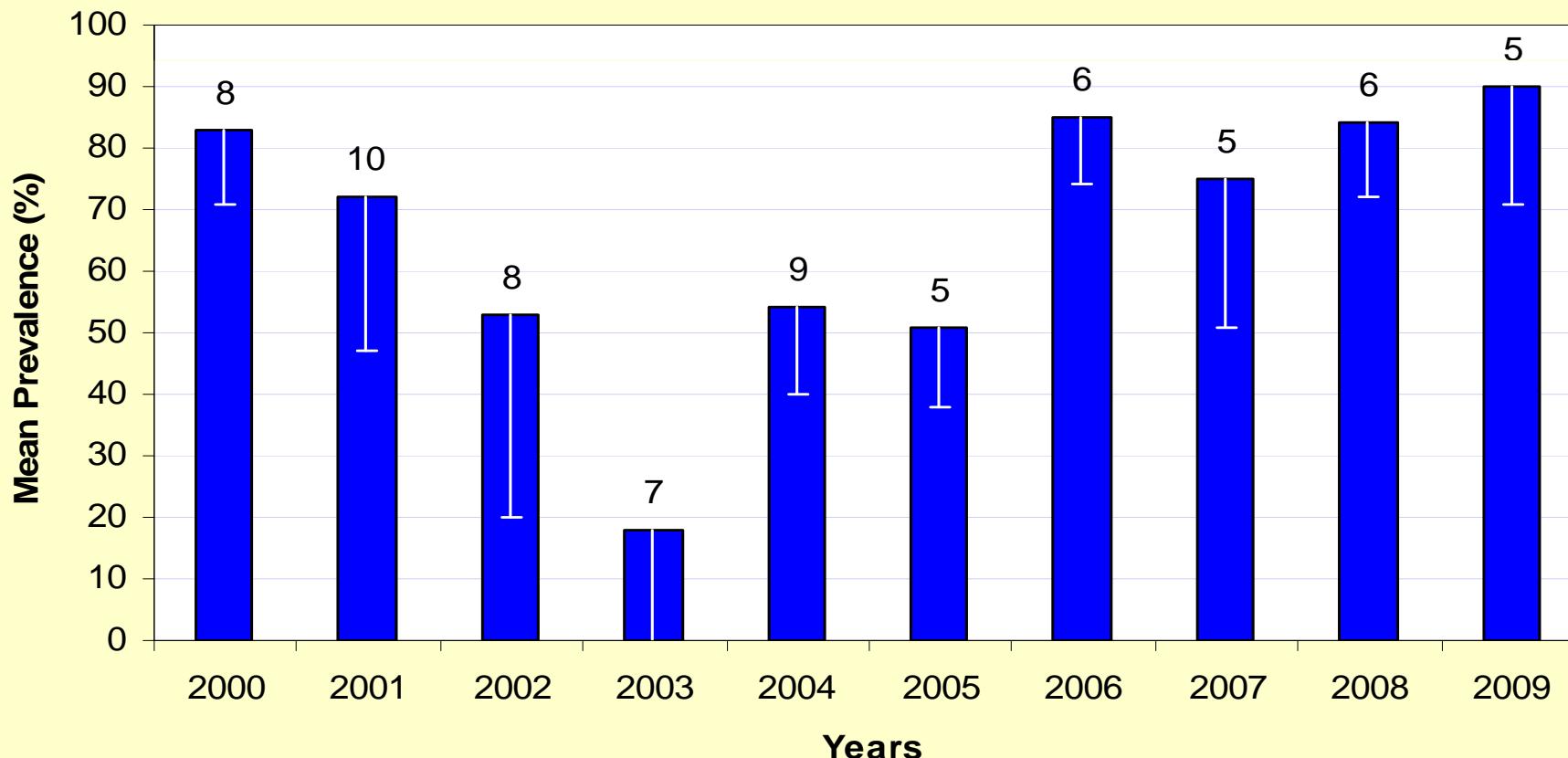


- **INFECTS CLAM GILL CELLS**
- **65 – 87 nm DIAMETER VIRUS**
- **VIRUS ASSEMBLY IN NUCLEI**
- **PROBABLE DNA GENOME**

GENH DISEASE PREVALENCES

2000 - 2009

Mean - SD annual GENH disease prevalences among *Mya arenaria* clams
in Chesapeake Bay, 2000-2009. Sample numbers appended.



KNOWLEDGE SUMMARY

- Virus infections of *Mya arenaria* gills are common among Chesapeake Bay softshell clams.
- Frequent intense infections may compromise critical feeding and respiration functions of clam gills.
- Lethal consequences are unknown.
- The geographic range and transmission mechanisms of the disease are both uncertain.

RESEARCH OBJECTIVES

- Identify the virus by analysis of genome sequences.
- Develop molecular assays (PCR) to detect and enumerate the virus in clam tissues and environmental samples.
- Develop DNA probes and assays (ISH) to detect the virus in current and historic clam tissue samples.
- Use the new assays to determine where the disease occurs, how it's transmitted between clams, and what its consequences are.

CHESAPEAKE BAY *MYA ARENARIA* FUTURES ?

YES WE CAN !



QUESTIONS ?



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