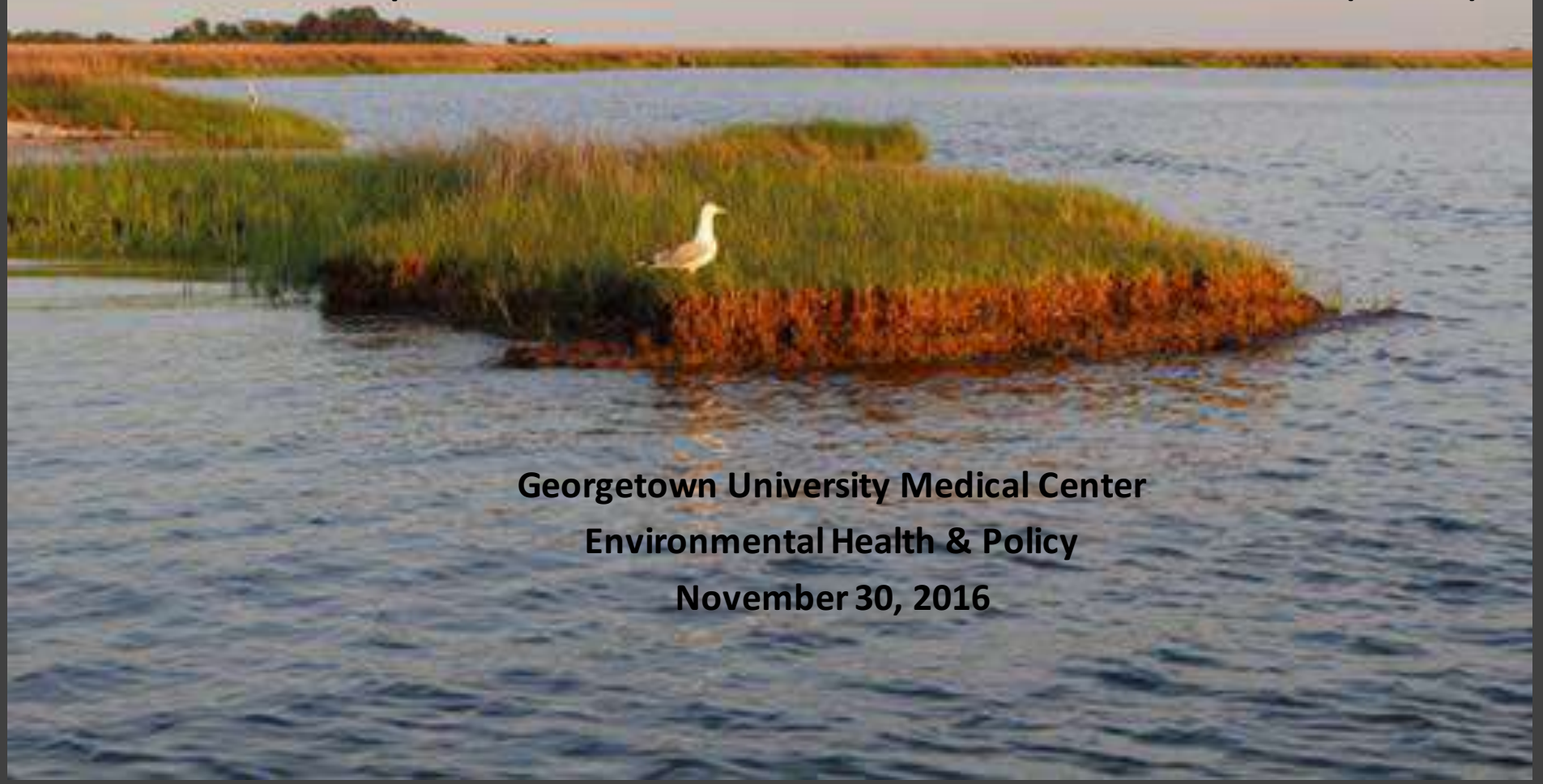
Harmful Algal Blooms: Informing the Public

By Robin M. Tyler Ph.D., Aquatic Ecologist

Delaware Department of Natural Resources and Environmental Control (DNREC)



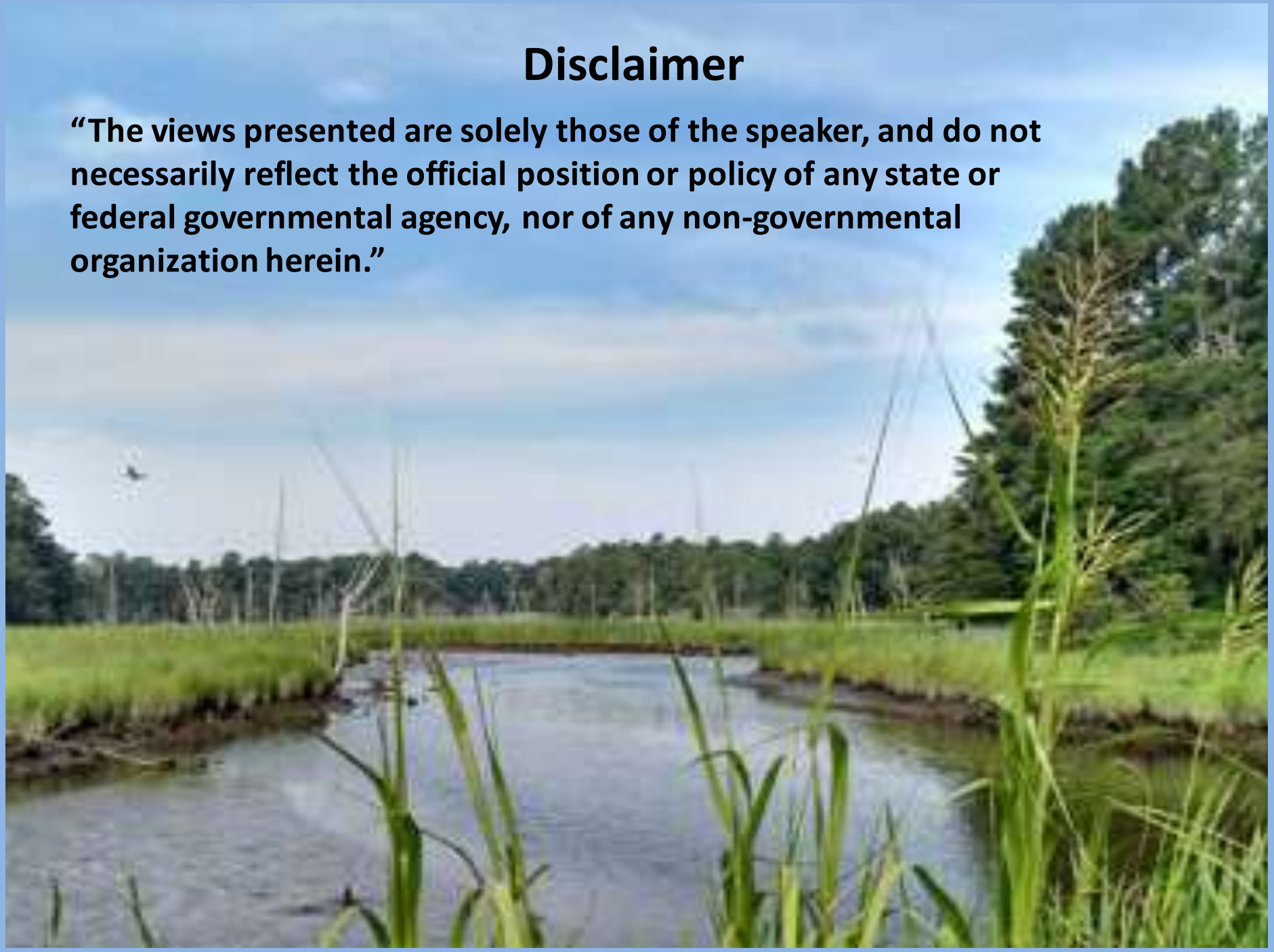
Georgetown University Medical Center

Environmental Health & Policy

November 30, 2016

Disclaimer

“The views presented are solely those of the speaker, and do not necessarily reflect the official position or policy of any state or federal governmental agency, nor of any non-governmental organization herein.”



The Speaker - Some Introductory Background

Born and Raised: Lower Eastern Shore of Maryland

Work Experience: Chesapeake Bay Commercial Waterman (70's-80's) – Self employed
The Chesapeake Bay Foundation (80's) – Private, Non-profit
State of Delaware (1990 – present) – Government

Education:
1981 - Salisbury State College, B.S. Biology
1987 – University of South Carolina, M.S.P.H.
Environmental Planning and Assessment
2005 – University of Delaware, Ph.D. Marine Biology

What a long strange trip it's been.






Content

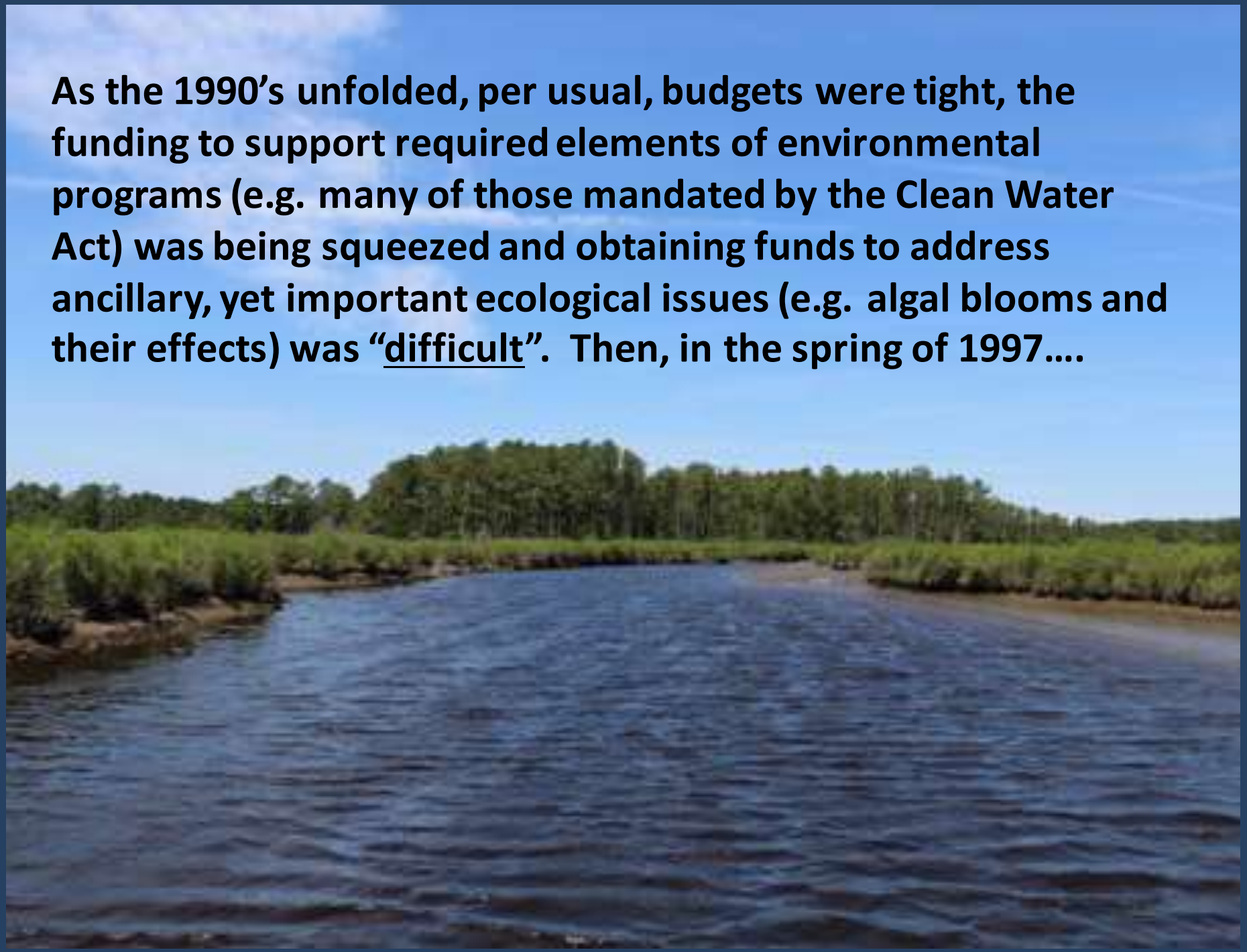
Part 1: Highlights regarding the sudden eruption and ensuing **REACTIVE** whirlwind resulting from perhaps the world's biggest ever Harmful Algal Bloom story.

Part 2: A more in-depth look at a **PROACTIVE** process on the part of government to inform the Delaware public regarding the potential hazards of a worldwide algal condition that has been associated with human society for much longer than anyone now living.

Ecological monitoring and research and changing the belts on a car share some things in common.

A) It's hopefully done before there's a breakdown that strands you under bad conditions

B) Is paid for reluctantly because there's usually something more "urgent" to spend $$ on.



As the 1990's unfolded, per usual, budgets were tight, the funding to support required elements of environmental programs (e.g. many of those mandated by the Clean Water Act) was being squeezed and obtaining funds to address ancillary, yet important ecological issues (e.g. algal blooms and their effects) was "difficult". Then, in the spring of 1997….

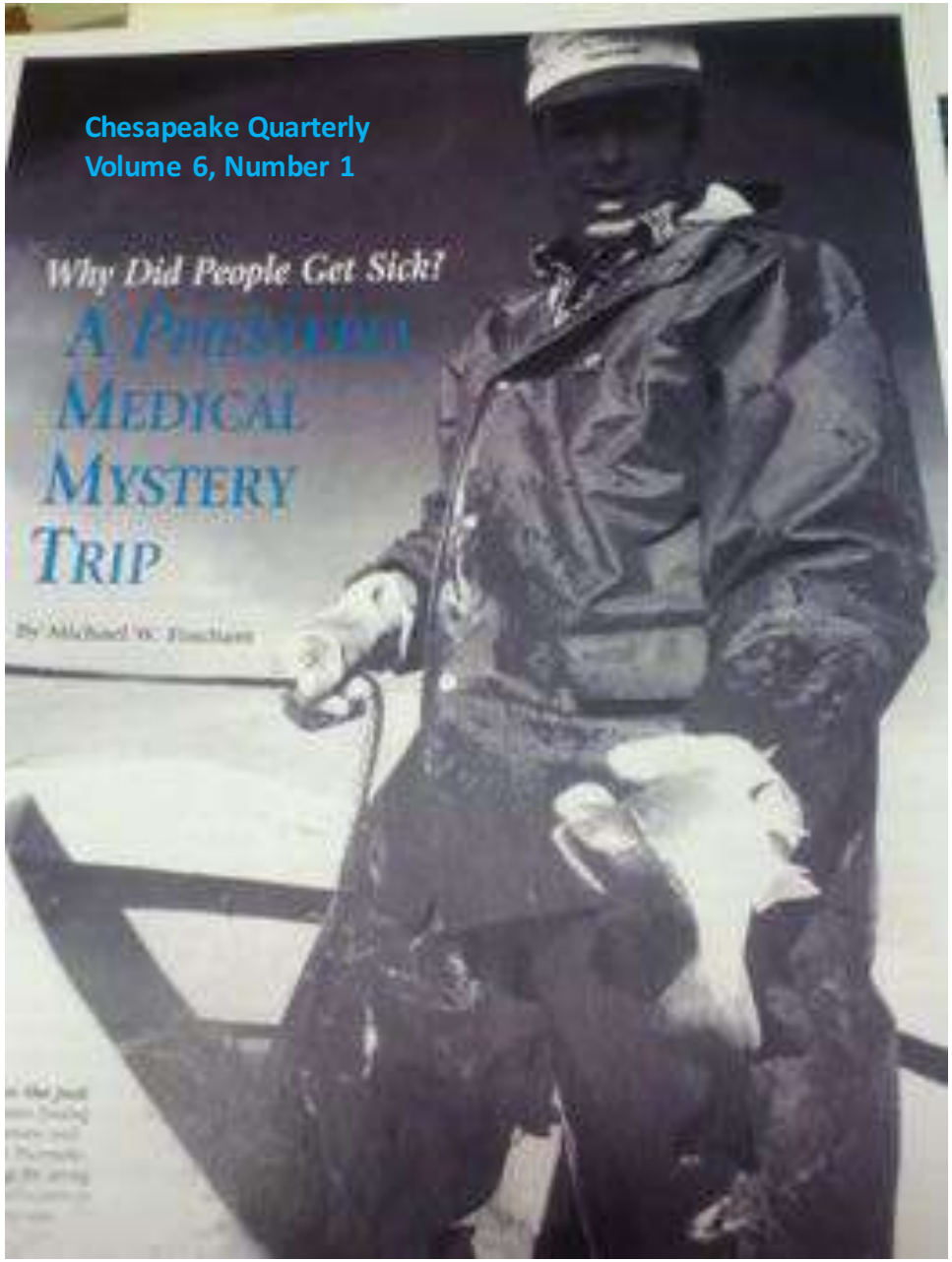
“There’s something happening here, but what it is ain’t exactly clear....” Source: Buffalo Springfield

A sick fish situation

evolved into

A sick people situation

AND



Baltimore Sun

8/31/97

Fish toxin affects brain

Human memory loss was key to linking illness, Pfiesteria

Relief for victims

Controversy

The PFIESTERIA Hysteria

New studies cast doubts on the "phantom fish killer."

By Maureen Milne Donal

Reports of a phantom-like fish-killing organism lurking in the shallows of East Coast waters are fast becoming part of our daily media diet. Hard to capture, and capable of

and dying. Sup... small, unidenti... JoAnn Burkholder ... the university, ... Burkholder ... a dinoflagellate

Bay's economy, future feel sting of Pfiesteria

9-21-97

The Sun

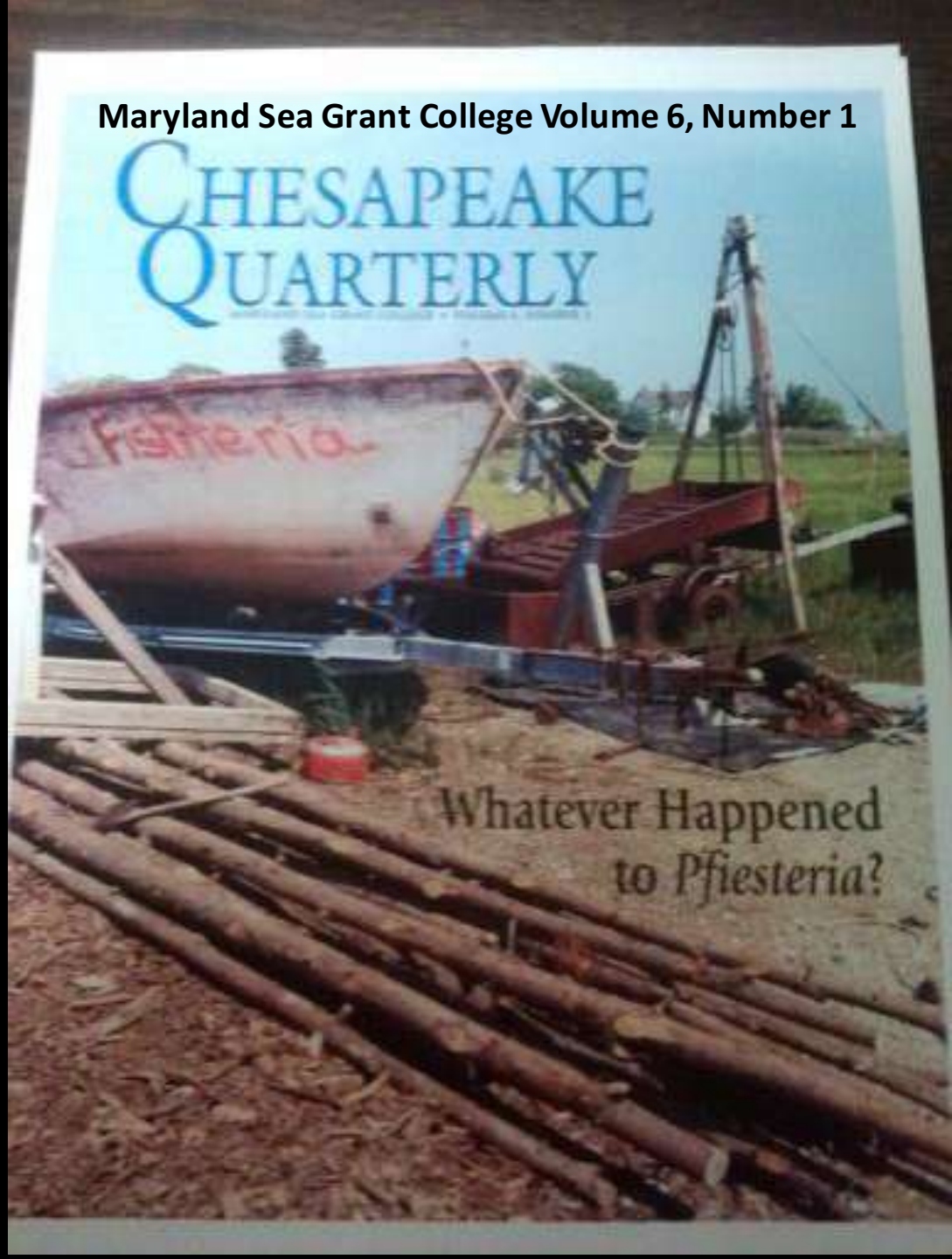
How Big A Story Was Pfiesteria?

In <u>one</u> year

# Stories	
Baltimore Sun	170
Washington Post	130

# Reporters Assigned	
Baltimore Sun	21
Washington Post	24

Covered on ABC, NBC, CBS



NASA joins Pocomoke pfiesteria investigation

8/22/97

The unmanned weather sta-

8/6/97 Wilm. News Journal

Scientists seek a killer

Laying blame for the bays

Wilm. News Journal 9-28

Farm runoff furor started

The Sun

Scientists find no easy way to control fish-killing bacteria

Ecological warning signal

8/30/97 U. Tamal

Maryland closes part of Pocomoke River

Fish: Memory loss is linked to toxin in water

Maryland Sun - 8/19/97

Technicians ill after work in Pocomoke

Fear mongering is deplorable

Editor Of The Times:

8/12/97

suspected culprit, pfiesteria piscicida, is

reported to be active only in brackish

Senators tour Pocomoke, promise help

Effects of Pfiesteria on humans becoming clearer, scientists say

3 grocery chains again to sell rockfish after Glendening calls

The Sun 9-26-97

Scientists, watermen at odds with DNR

Pfiesteria fears aside, fish fry will go on

Fears sink charter business

Word of Pocomoke fish

newcomers afraid to come here."

Approximately 40 charter boat captains fr

the Crisfield

Crisfield cancels fish fry

'No danger' in fishing on the bay, governor says

Few solutions to river woes

Reports hurting fish sales

By TODD SPANGLER

Associated Press Writer

SHELLTOWN — The myster-

ous deaths of thousands of fish

on the lower Pocomoke River

have multiplied state scientists,

sending them scurrying to

explain the cause.

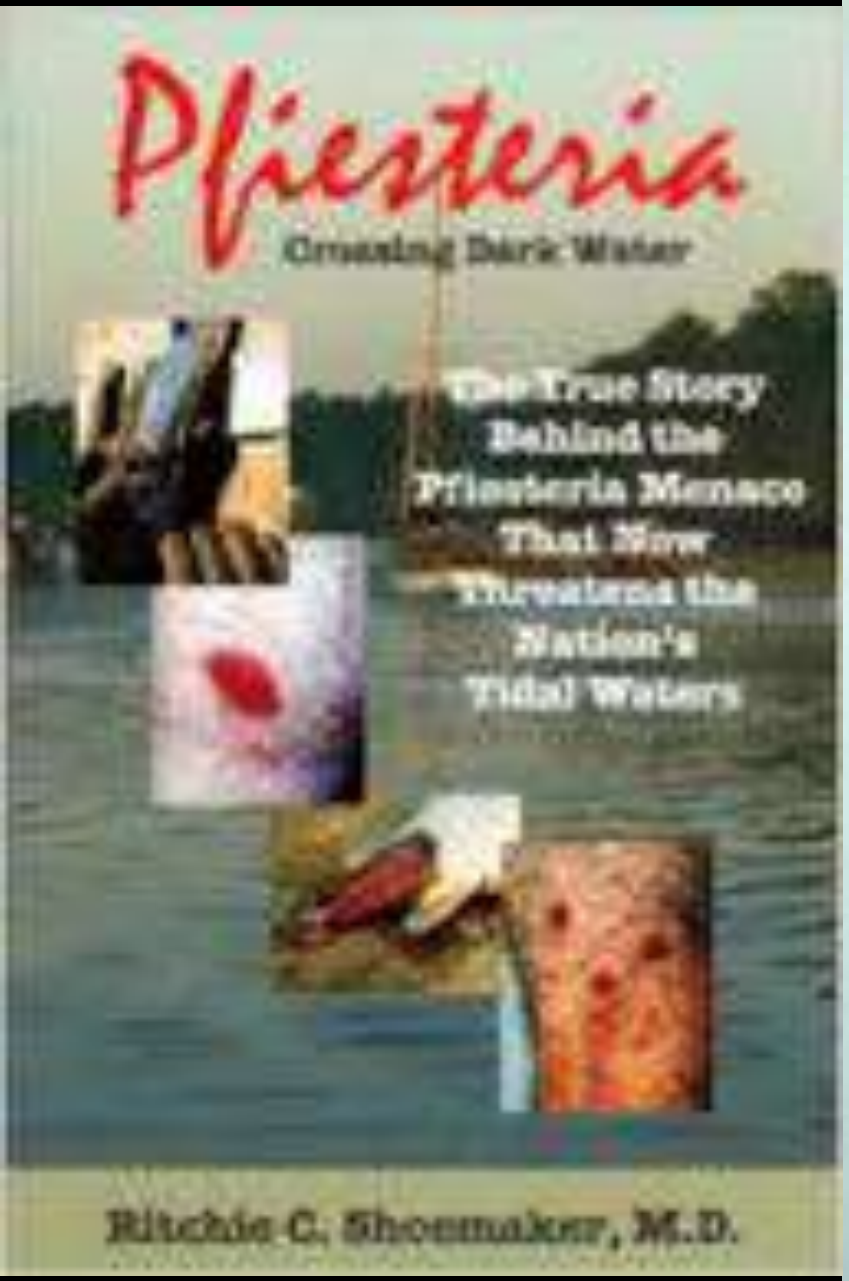
Experts from three agencies

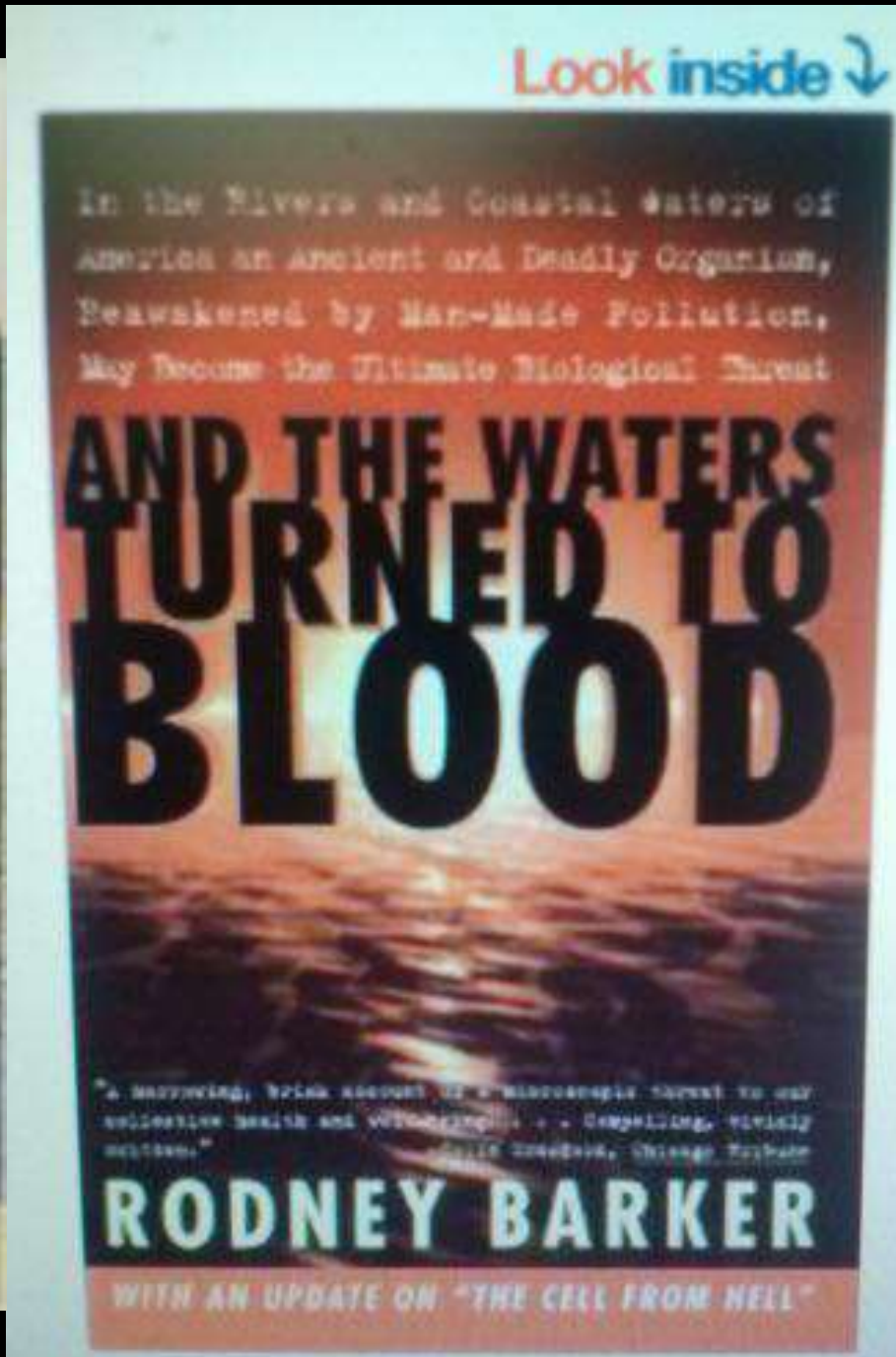
are on hand. So are specialists

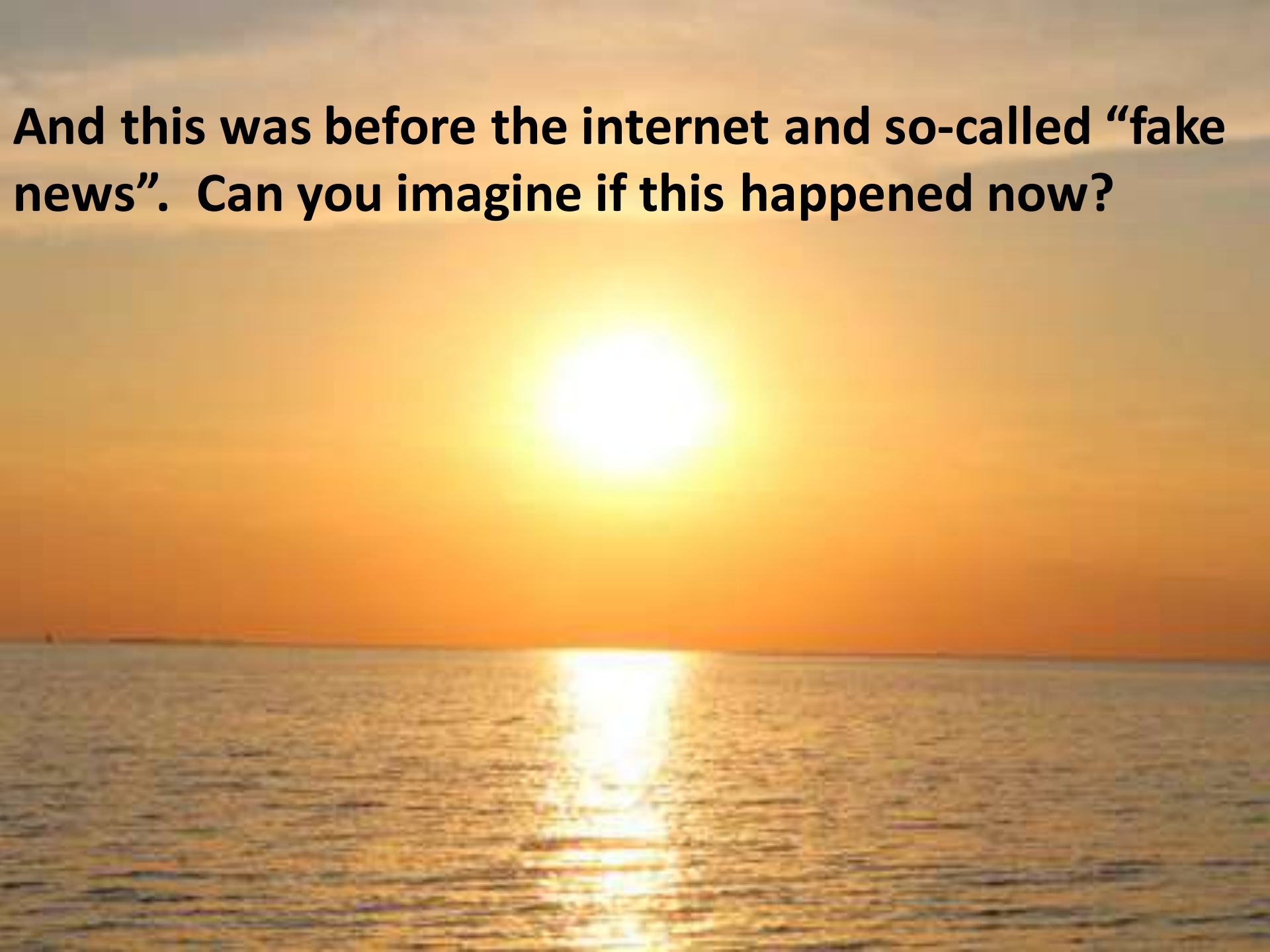
Governor launches seafood blitz

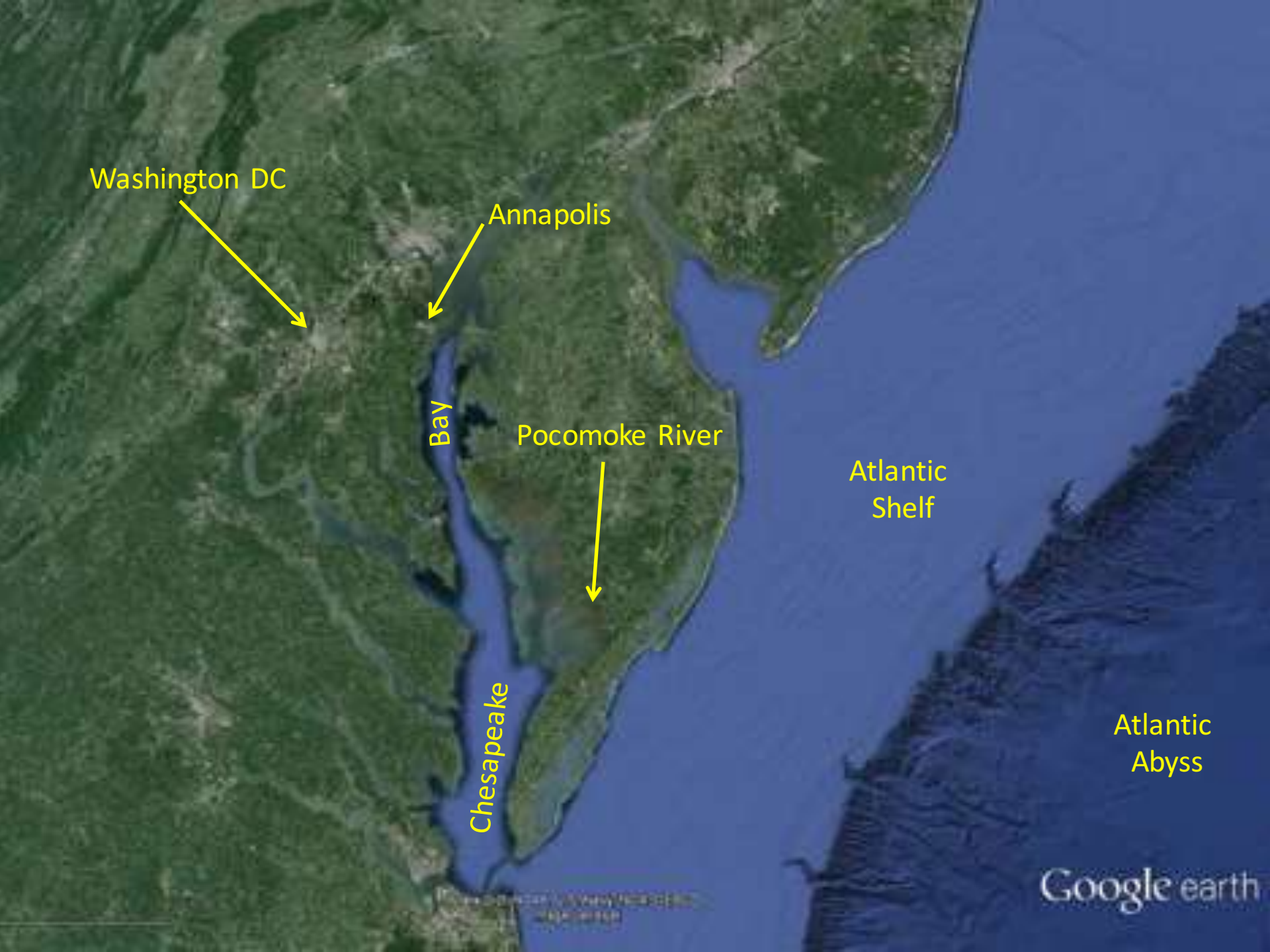
People feel affects of Pocomoke River

5/19/97

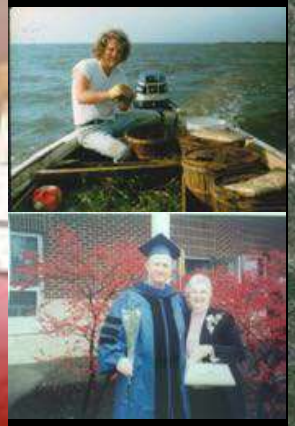

Pfiesteria
Creeping Dark Water
The True Story Behind the Pfiesteria Menace That Now Threatens the Nation's Tidal Waters
Ritchie C. Shoemaker, M.D.


Look inside
In the Rivers and Coastal Waters of America an Ancient and Deadly Organism, Reawakened by Man-Made Pollution, May Become the Ultimate Biological Threat
AND THE WATERS TURNED TO BLOOD
RODNEY BARKER
WITH AN UPDATE ON "THE CELL FROM HELL"


And this was before the internet and so-called “fake news”. Can you imagine if this happened now?


Washington DC
Annapolis
Bay
Pocomoke River
Atlantic
Shelf
Chesapeake
Atlantic
Abyss
Google earth

Here I am, I can help.




Shelltown, MD
Google earth

PERRY THORSVIK | SUN STAFF

Matter of trust: *The Rev. Donald O. Clendaniel of Immanuel United Methodist Church said his parishioners are used to nature's hardships.*

Faithful say prayer needed in battle against Pfiesteria

The Sun 9-21-97

Feds will study river health risk

Public calm requested

By DOUGLAS HANKS
Daily Times Staff Writer

POCOMOKE CITY — Two top federal health agencies will help Maryland determine if the microorganism ravaging fish in the Pocomoke River is also making humans sick, Maryland's U.S. senators said Monday.

The Centers for Disease Control and National Institute of Health will devote staff, expertise and equipment to studying public health risks — if any — linked to 11,000 dead fish found floating in the Pocomoke last week, Sens. Barbara A. Mikulski and Paul S. Sarbanes announced after touring a stretch of the closed river surrounding Shelltown Monday morning.

"When there is a kill, you need detectives," said Mikulski, who writes mystery novels in her spare time.

Officials now seem to be work-

Times Photo by Theresa Blackwell

Maryland Lt. Gov. Kathleen Kennedy-Townsend greets, Jackie McCready of the Chesapeake Bay Foundation before boarding a boat to tour the Pocomoke River.

Costs soar for pfiesteria tests

Post - 1997

A considerable amount of federal funding was allocated to numerous coastal states for monitoring and research related to *Pfiesteria* and eventually other types of potentially harmful algae.

As a result of this funding and effort considerable advances have been made in all facets of the harmful algal bloom universe – e.g. natural history, ecological interaction, biochemistry, toxicology, emergency response, information reporting, public awareness, more…….

The happy enigma of it all is that no such combined outbreaks of fish and human health illness have recurred in the Pocomoke River or occurred anywhere else to the present (2016).

Wilmington. News Journal 3/16/1998

Highlights of
Delaware's Response to *Pfiesteria* in Maryland

1997 - There were no environmental events happening in Delaware that resembled in any way what was happening about 50 miles away in the Pocomoke River.

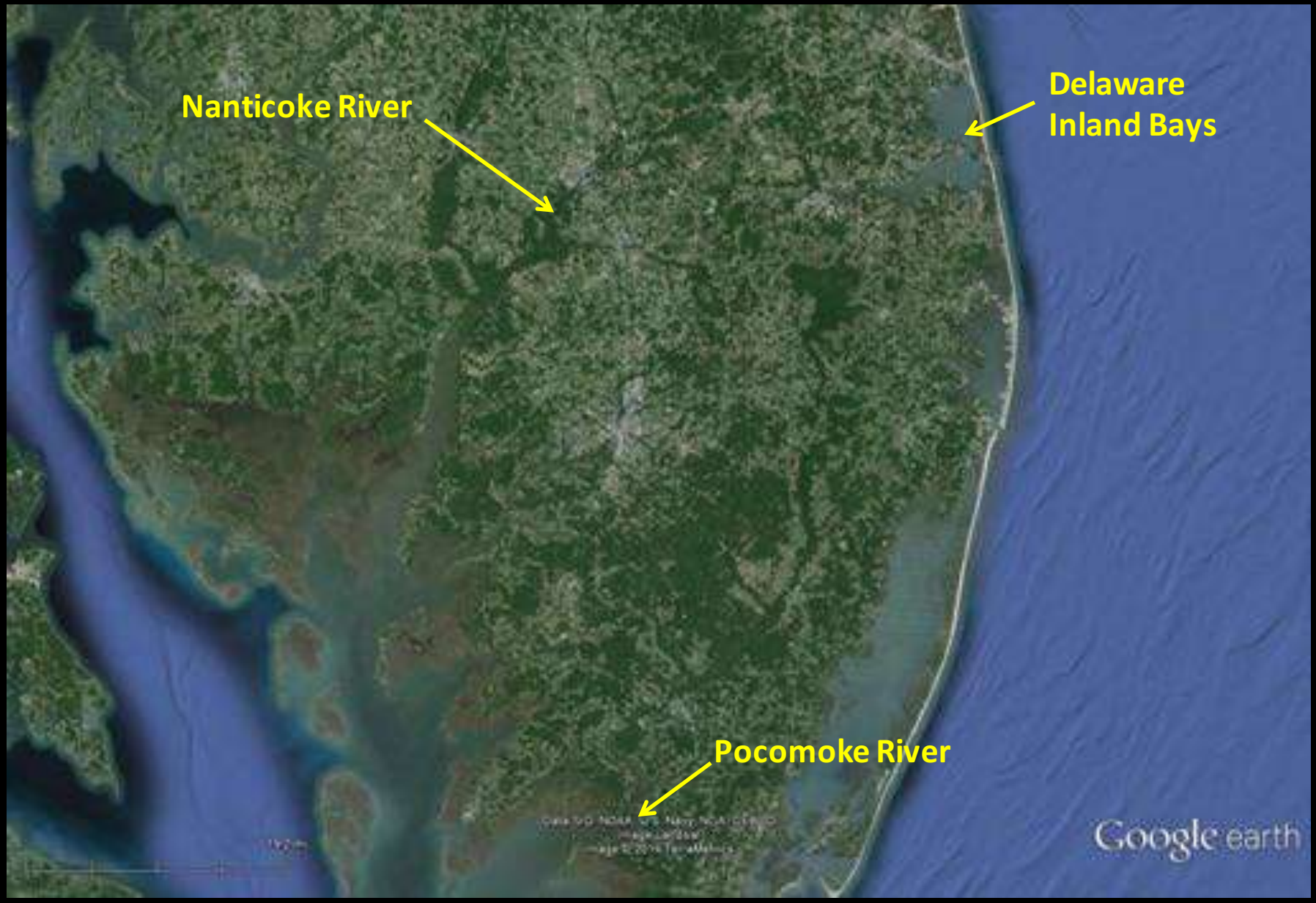
1997- Based on some fish kill history in the 1980's, before Pfiesteria was known, with characteristics similar to the Pocomoke River event, close proximity to the Pocomoke and having waters with characteristics similar to the Pocomoke, Delaware officials conducted a cursory survey to see if *Pfiesteria* was present.

1998 – Delaware secured Federal funding to monitor selected Delaware waters for Pfiesteria.

1998-2008 – Delaware monitored selected waters for Pfiesteria and related conditions and expanded the work to include other types of harmful algae/microbes.

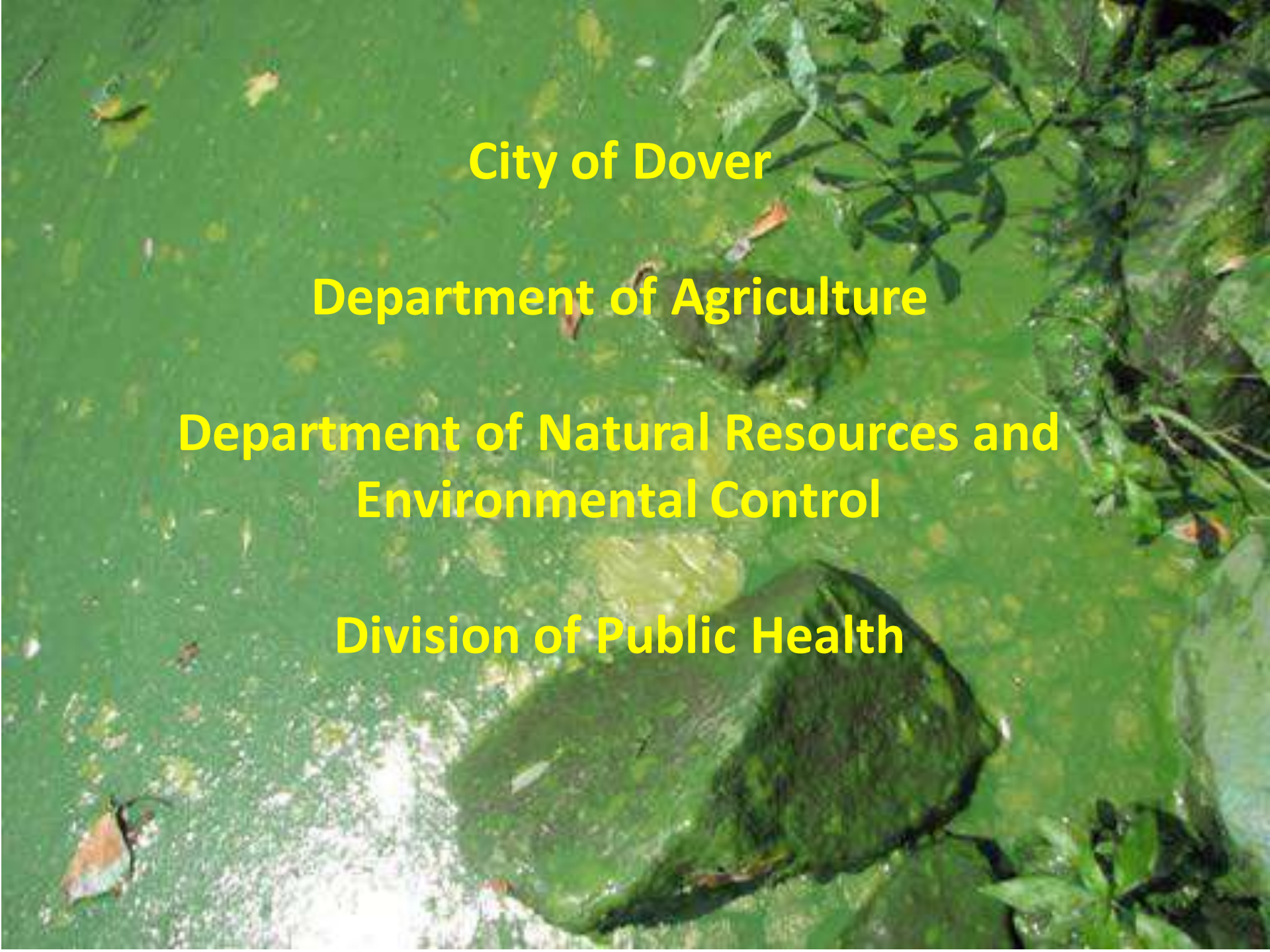
2009 – Funding specific to Harmful Algal Bloom related activities ended. State involvement has been minimal thereafter, but, see Delaware Citizens Monitoring Program and Delaware Universities and Colleges.

Delaware's Response to *Pfiesteria* in Maryland



A Multi-agency Project to Inform People Regarding the Potential Health Effects of Blue-green Algae Toxin in Delaware Ponds

Photo: unknown Delaware pond


City of Dover
Department of Agriculture
Department of Natural Resources and Environmental Control
Division of Public Health

Thank You
Blue-green Algae Committee

Michael Bott
Melinda Carl
Zachary Carter
Matthew Dibona
Anne Fitzgerald
Caroline Hughes
Edythe Humphries
Robert Line
Jamie Mack
Roy Miller
Melanie Rapp
Debbie Rouse
Craig Shirey
Robin Tyler
Jennifer Wooleyhand

Mission

To inform that something (blue-green algae) which people may have become accustomed to seeing in the water may sometimes cause sickness in people and animals.

Hearns Pond, Seaford Delaware, 1993, by R. Tyler

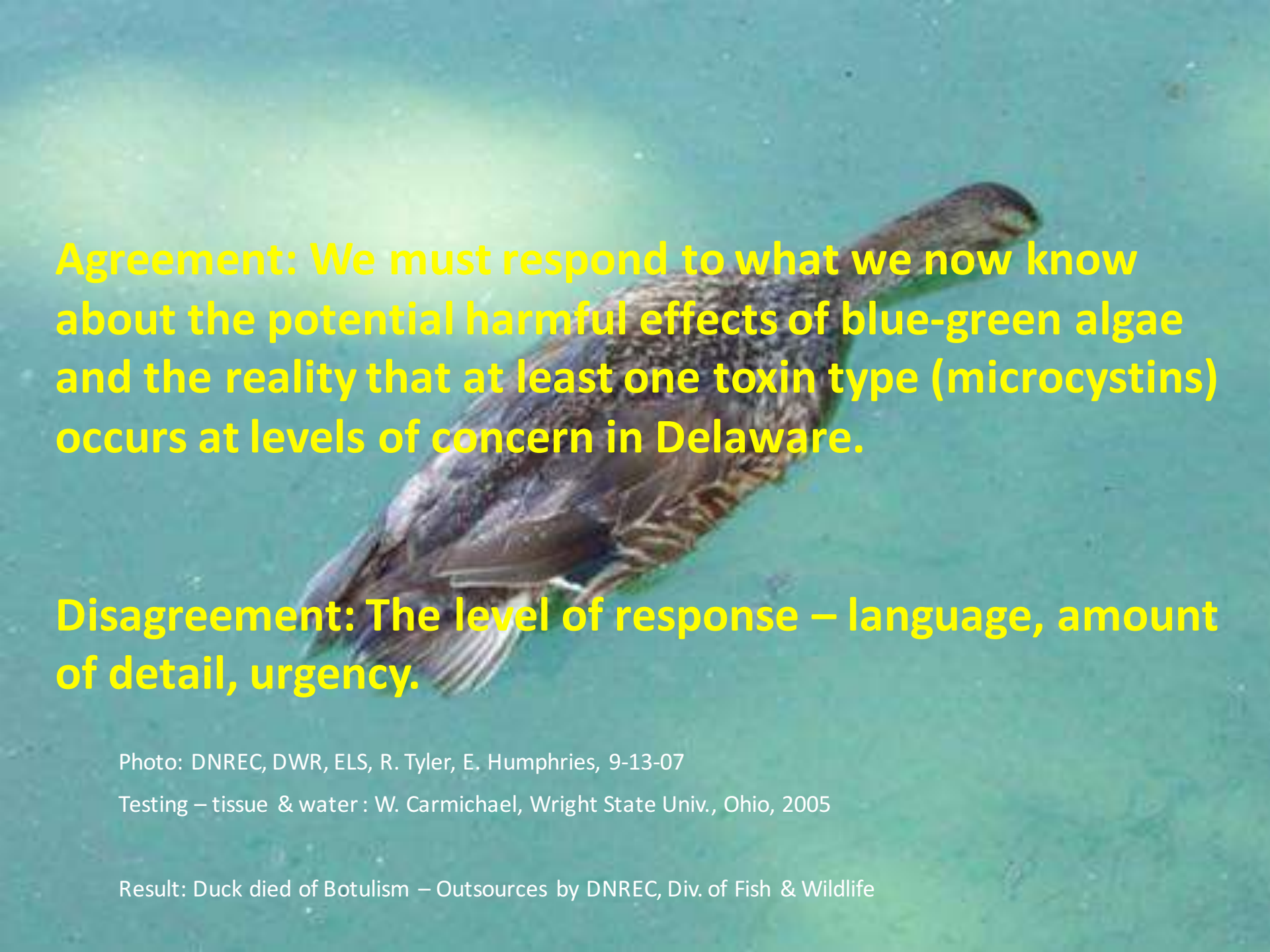
Informational Approaches

Sign

Press Release

Fact Sheet

Website



Agreement: We must respond to what we now know about the potential harmful effects of blue-green algae and the reality that at least one toxin type (microcystins) occurs at levels of concern in Delaware.

Disagreement: The level of response – language, amount of detail, urgency.

Photo: DNREC, DWR, ELS, R. Tyler, E. Humphries, 9-13-07

Testing – tissue & water : W. Carmichael, Wright State Univ., Ohio, 2005

Result: Duck died of Botulism – Outsources by DNREC, Div. of Fish & Wildlife

(Entering, swimming in, recreating in) ambient water is never a risk free activity!

Jack Pingree

Objective

To focus people's attention on the blue-green algae condition that poses the highest risk - the paint-like scum.

Objective

To focus people's attention on:

Activities that pose the highest risk (those which may result in swallowing scum-laden water).

Groups that are at highest risk (children and pets)

Sign, sign, everywhere a sign,

Blocking out the scenery, breaking my mind,

Do this, don't do that,

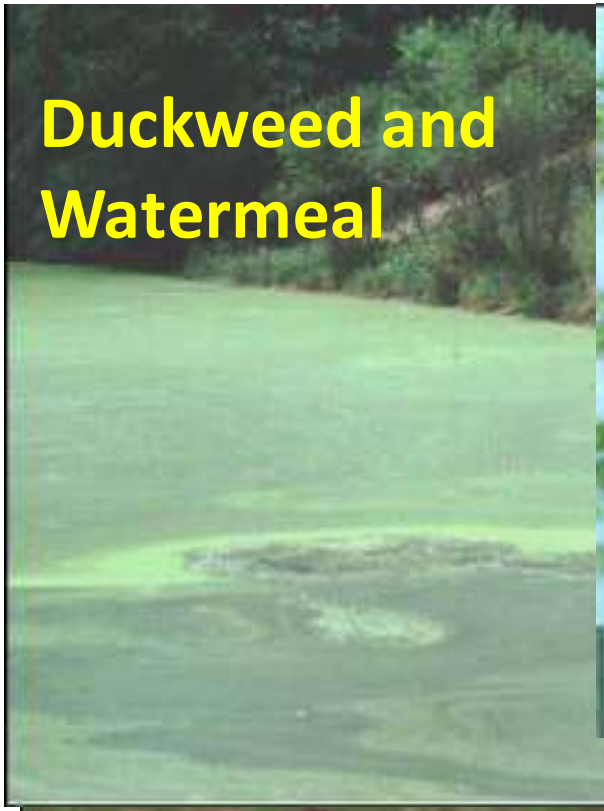
Can't you read the sign

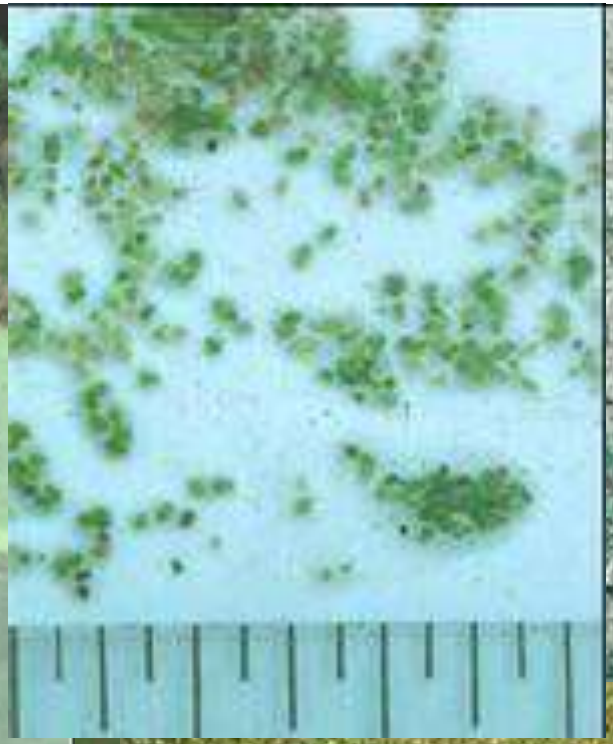
Five-Man Electrical Band - 1970

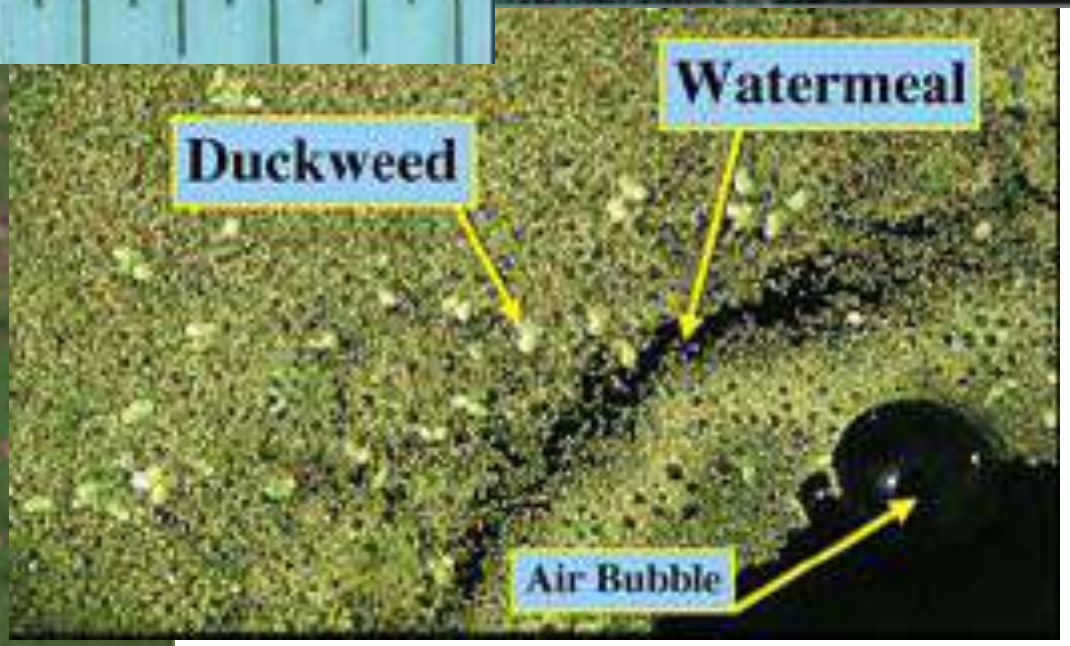
http://www.ndeq.state.ne.us/Newslett.nsf/pages/Win04-1, Nebraska Dept. of Environmental Quality

How do we strike the delicate balance which informs people that there may be something in the water which can be harmful without leading them to be afraid, even though the risk of harm (which is very poorly understood) may be lower than the risk they took in driving or walking to the pond in the first place.

Duckweed and Watermeal







http://www.google.com/search?hl=en&q=Duckweed&aq=f&oq=

Assumption / Certainty

Assumption: Blue-green algae will continue to be part of the conversation pertaining to human, animal and environmental health in Delaware.

Assumption: The message that government conveys will adjust to new knowledge.

Other assumptions?

Certainty: Even if assumptions prove false, the condition will still be here.

Sign

Posted only at publicly owned ponds known to have annually recurring blue-green algae blooms.

Water Advisory

Water may contain blue-green algae that is harmful to humans and animals

Avoid thick green, white, or reddish-brown scum on the surface of the pond.

Avoid activities that can result in swallowing water that contains scum. This may affect your health.

Wash with clean water as soon as possible following contact with blue-green algae.

If you, your children or your animals become sick after contact, call your doctor or veterinarian.

For more information go to www.wr.dnrec.delaware.gov

Press Release

Released by DNREC

Days in advance of sign deployment.

Silver Lake (Dover), D. Wolanski 2008

Website

Up at time of sign placement, with basic information and photos.

Follow link on the sign or Google Delaware and blue-green algae

Fact Sheet

Much is left to do.

Much has been done.

History Matters!

“I don’t know the reason” and “there’s no reason” are not the same thing.

Everything comes from something.

Study Environmental History

People seem to be forgetting or have yet to learn why there is a need for environmental and public health programs. (Source: the Presenter's informed opinion based upon 35 years of observation in the field of Ecology)

An introductory primer of examples of Environmental and Public Health Events that led to and/or verify need for current governmental regulatory programs: Source: www. Using simple key word searches

1920's – Washington DC, Chicago, New York (contamintated oysters)
1948 – Doroma, Pennsylvania
1969 – Cuyahoga River - Cleveland, Ohio
1970's – Love Canal, Niagara Falls, New York
1980's – Times Beach, Missouri
1980's - James River, Virginia (Kepone release)

Thank You

QUESTIONS?

COMMENTS

Enjoy your work and strive to make it interesting!

"There is a curious idea among unscientific men that in scientific writing there is a common plateau of perfection. Nothing could be more untrue. The reports of biologists are the measure, not of the science, but of the men themselves. There are as few scientific giants as any other kind. In some reports it is impossible, because of inept expression, to relate the descriptions to the living animals..... The same faults of carelessness will be found in scientific reports as in the witness chair of a criminal court. It has seemed sometimes that the little men in scientific work assumed the awe-fullness of a priesthood to hide their deficiencies, as the witch-doctor does with his tilts and high masks, as the priesthoods of all cults have, with secret or unfamiliar languages and symbols. It is usually found that only the little stuffy men object to what is called "popularization" by which they mean writing with a clarity understandable to one not familiar with the tricks and codes of the cult. We have not known a single great scientist who could not discourse freely and interestingly with a child. Can it be that the haters of clarity have nothing to say, have observed nothing, have no clear picture of even their own fields? A dull man seems to be a dull man no matter what his field, and of course it is the right of a dull scientist to protect himself with feathers and robes, emblems and degrees, as do other dull men who are potentates and grand imperial rulers of lodges of dull men." *Source: John Steinbeck, 1941. The Log From the Sea of Cortez, Chapter 10.*