# NCASI at 75: A Retrospective

NCASI

IMPACT. SCIENCE. SOLUTIONS.

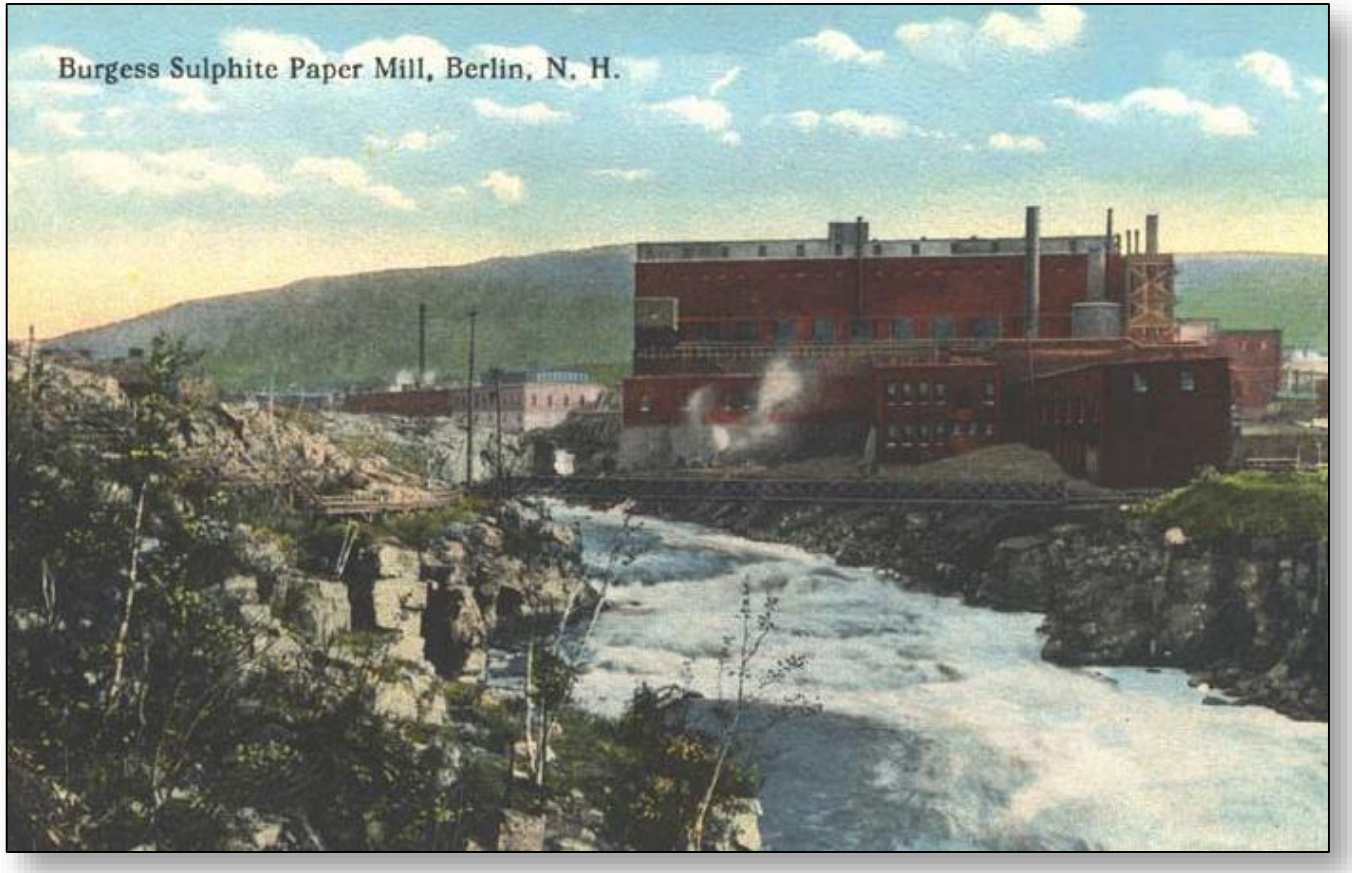
# What we learn from NCASI's history

- Born of need
- Nurtured by members
- Trusted by stakeholders
- Tested by crisis
- Responsive to change

- …Now the details

# It all started with the Sulfite Process…

- “With the perfection in the mid-1880s of the sulfite process for breaking down wood fibers, this large plant was built on the east side of the Androscoggin River. ”*




*From: A River's Journey: The Story of the Androscoggin - https://www.bethelhistorical.org/legacy-site/A_River%27s_Journey.html

# …And Untreated Discharges of Sulfite Liquors

- “By the spring of 1907, 20-foot drifts of yellow-brown foam [were] coming from the canals in Lewiston.”
- As discharges increased, dissolved oxygen levels dropped. In 1930s “residents began noticing the Androscoggin’s stench.”
- “The Great Falls in Lewiston and Auburn dispersed the hydrogen sulfide gases; as the water misted into the air, a rotten egg odor wafted across the two cities. Some store owners had to shutter their doors, and freshly painted homes were blackened as the hydrogen sulfide reacted with lead compounds in the paint.”

From: W.S. McFarlane, Defining a Nuisance: Pollution, Science, and Environmental Politics on Maine’s Androscoggin River, *Environmental History 17 (April 2012): 307–335.*

# Not Limited to Maine or the Paper industry

- “It can definitely be concluded that waste sulphite liquor is the major source of pollutional troubles in Green Bay in winter months.”[1]
- "The entire lower Detroit River is posted by the State Department of Health as being unsafe for bathing…. Oils and scums, accompanied by floating debris, make bathing an ordeal “[2]

Clipped From Picture in National Archives Catalog: Id 553451

[1] From: Investigation of the pollution of the Fox and East Rivers and of Green Bay in the vicinity of the city of Green Bay, https://books.google.com/books/about/Investigation_of_the_Pollution_of_the_Fo.html?id=L4tEAAAAMAAJ

[2] From : Detroit Water and Sewerage Department The First 300 Years, http://dwsd.org/downloads_n/about_dwsd/history/complete_history.pdf

# Work had begun but more was needed…

- “Despite the expenditures of … vast sums of money, the industry’s problem is still far from a solution. This unsatisfactory condition results from the fact that the attempts to solve the problem have been largely on an individual mill basis,… and in most cases the experience of the individual mill has not been available to the industry at large.”

From:

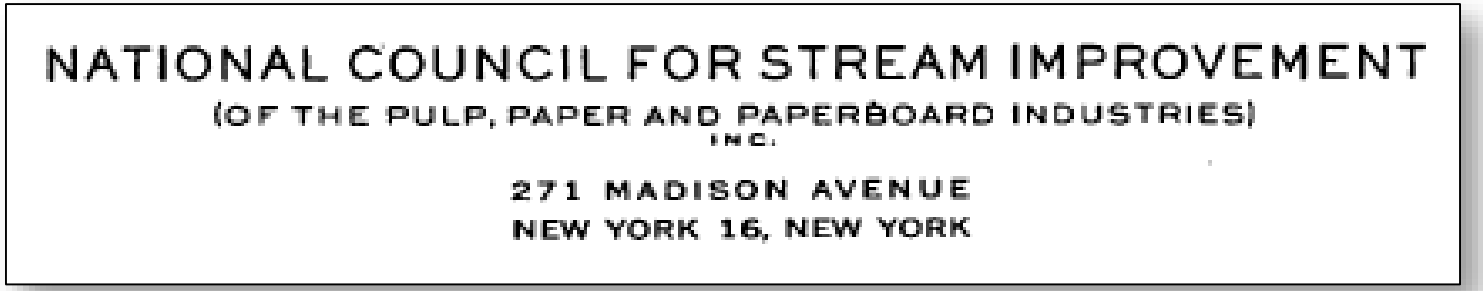

Organization and Activities of the National Council for Stream Improvement (Of the Pulp, Paper and Paperboard Industries), Inc.

*Sewage Works Journal*
Vol. 16, No. 5 (Sep., 1944), pp. 962-965

Published by: Water Environment Federation
Stable URL: http://www.jstor.org/stable/25029874
Page Count: 4

# The industry's response

- In 1942 and early 1943, the industry's leaders convened a series of meetings, under the auspices of what is now the American Forest & Paper Association (AF&PA)
- April 22, 1943, the industry decides that the industry needs a "separate and autonomous corporation" to conduct research into means for controlling water pollution.
- National Council for Stream Improvement (of the Pulp, Paper and Paperboard Industries), or NCSI is created.


NATIONAL COUNCIL FOR STREAM IMPROVEMENT
(OF THE PULP, PAPER AND PAPERBOARD INDUSTRIES)
INC.
271 MADISON AVENUE
NEW YORK 16, NEW YORK

# Context: This is in the middle of WW II

- December 1941 – Pearl Harbor
- 1942
  - Battles of Coral Sea and Midway
  - Guadalcanal campaign
  - Japan invades Philippines
  - In 1942 alone, over 20,000 U.S. casualties and captured

- 1942 – early 1943
  - Industry discussions leading to formation of NCSI (later, NCASI)
  - Had the industry been looking for an excuse to avoid addressing environmental issues, it would not have had to look far.

United States Marines rest in the field during the Guadalcanal campaign

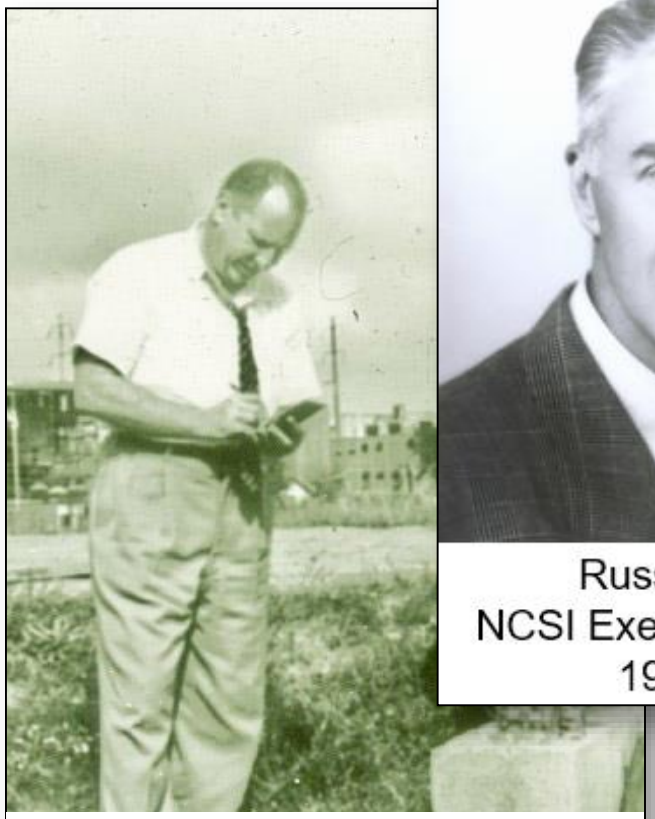
| | |
|---|---|
| Date | 7 August 1942 – 9 February 1943 (6 months and 2 days) |

https://commons.wikimedia.org/wiki/Guadalcanal_Campaign

# NCSI's early years

- In less than one year, NCSI's members represented 30% of U.S. production.
- NCSI's first employees:
  - Russell Winget, Executive Secretary
  - Dr. Harry Gehm, Technical Advisor
- Headquarters in New York City
- Research conducted at leading universities, managed by NCSI

Russell Winget
NCSI Executive Secretary
1943-1966



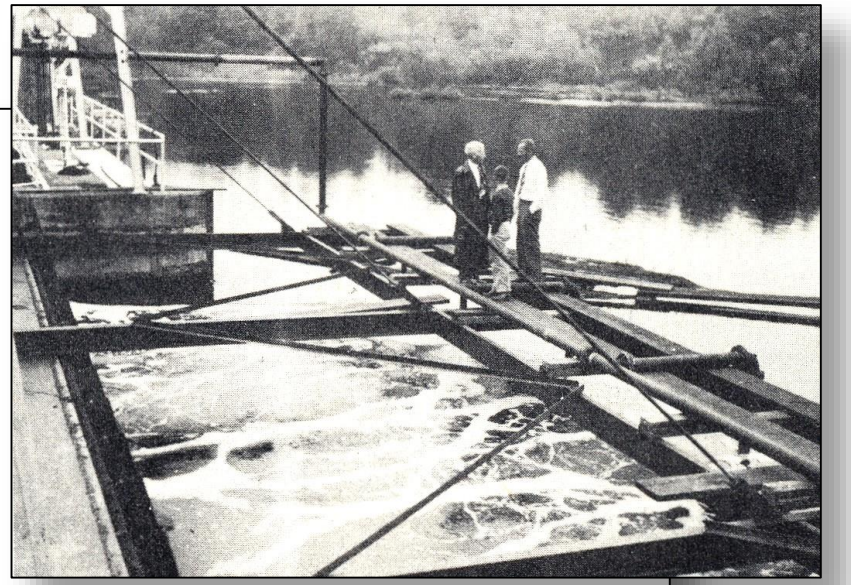
Dr. Harry Gehm
NCSI Technical Director
1944 –1968

# Early emphasis on supporting and disseminating mill experience with treating wastes

PILOT PLANT DEVELOPMENT PROJECT - NO. 1.

PILOT PLANT STUDIES ON WASTE TREATMENT AT THE NEW YORK AND PENNSYLVANIA COMPANY PULP AND PAPER MILL AT JOHNSONBURG, PENNSYLVANIA

April 15, 1953



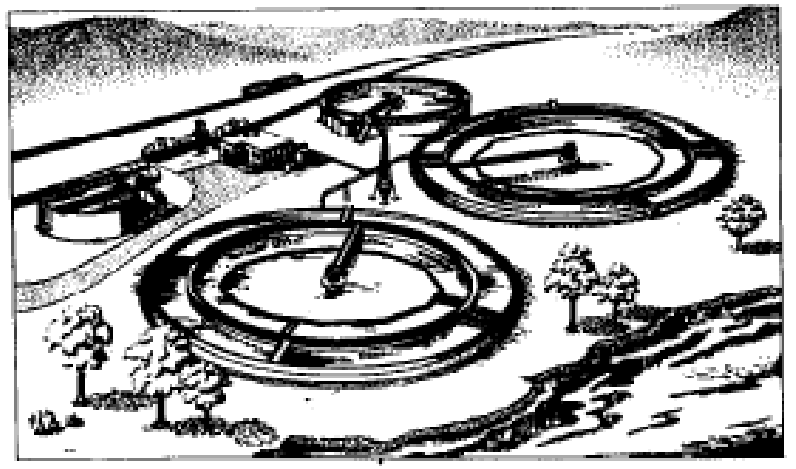


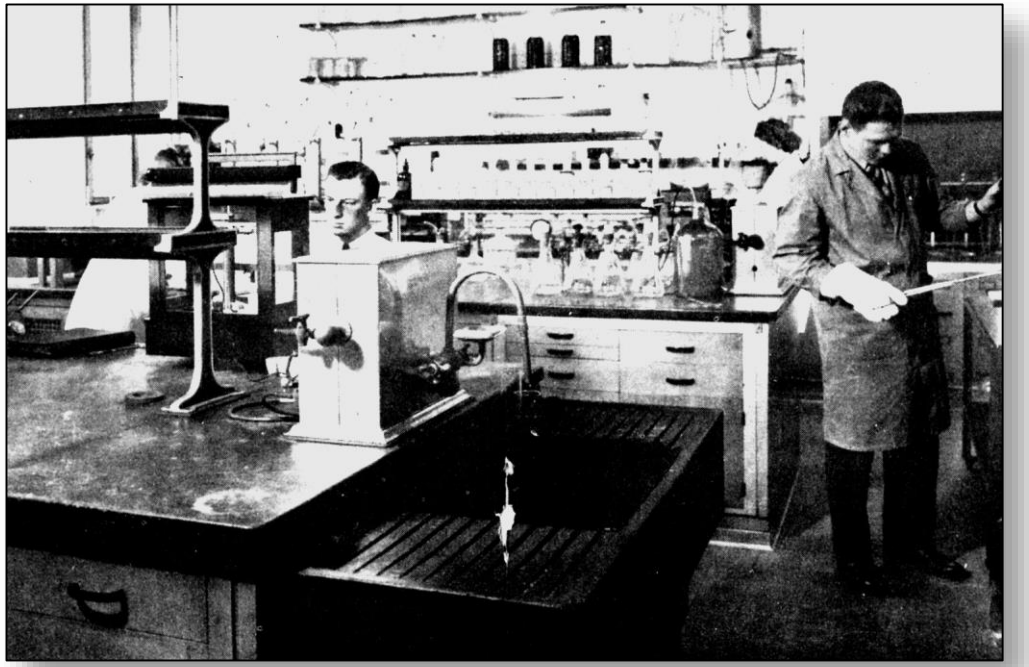
*Fig. 1. Drawing of waste treatment plant at West Virginia Pulp & Paper Co., Covington, Va.*

FINAL REPORT ON
DEINKING WASTE DEMONSTRATION TREATMENT PLANT AT
PLAINWELL, MICHIGAN

PROGRESS REPORT NO. 1 ON THE COOPERATIVE
WASTE TREATMENT PILOT PLANT
AT
MACON KRAFT COMPANY

# 1960s: NCSI adjusts to changing times

- By the early 1960s, the competition for university resources to examine pollution problems had become intense
- NCSI hires researchers and places them in research centers near the industry
- NCSI research laboratories subsequently sited at
  - Tufts University
  - Western Michigan University
  - Johns Hopkins University
  - University of Florida
  - Oregon State University



# Mid-1960s: NCSI gets new leadership

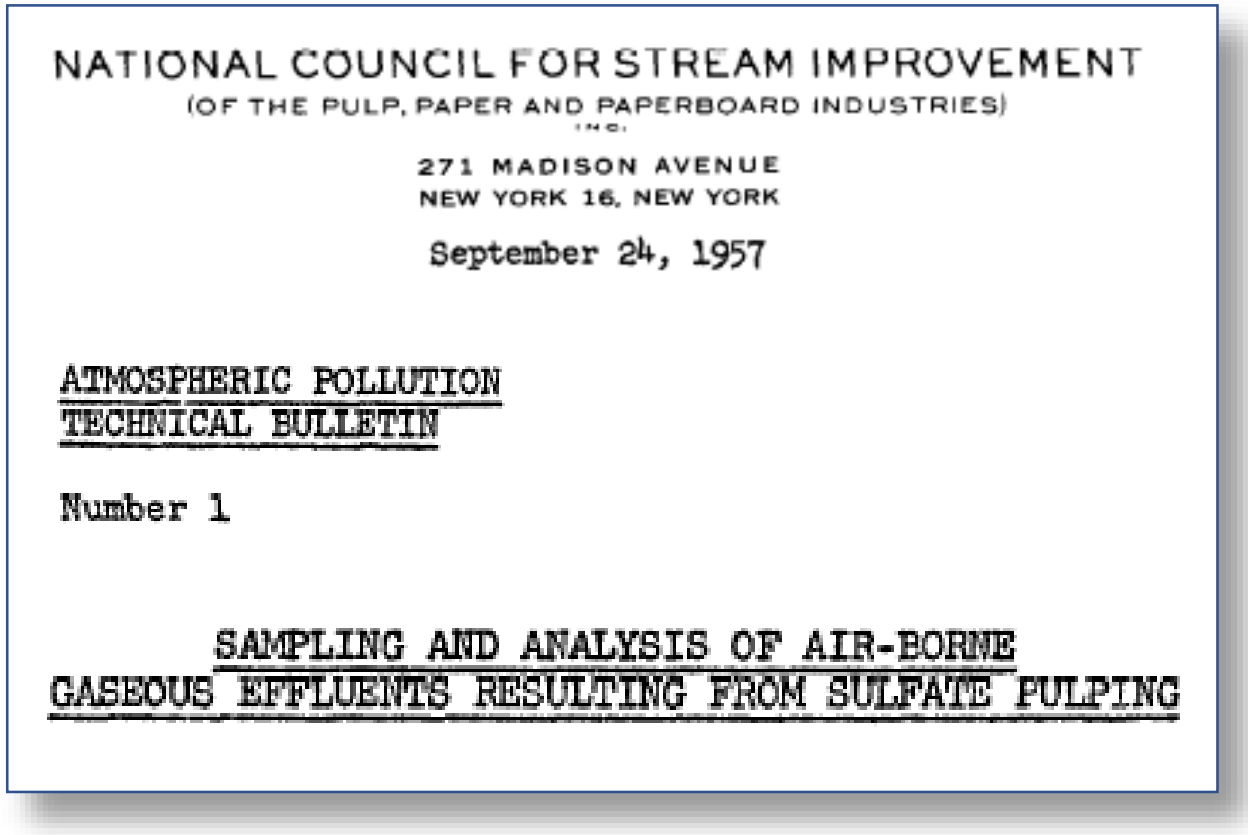
Russell Blosser named
Asst. Technical Director
and later,
Senior Vice President.
With NCASI 1957-1987

Dr. Isaiah (Sy) Gellman takes the helm in 1968 as Technical Director and later, President.
With NCASI 1956-1995

Ernest Boldoc,
Executive Director
With NCASI 1966 - 1977

# NCSI outgrows its name

- 1957: First Atmospheric Quality Technical Bulletin
- Early focus on kraft mill emissions
- In 1968, NCSI becomes the National Council for Air and Stream Improvement - NCASI



NATIONAL COUNCIL FOR STREAM IMPROVEMENT
(OF THE PULP, PAPER AND PAPERBOARD INDUSTRIES)
INC.
271 MADISON AVENUE
NEW YORK 16, NEW YORK

September 24, 1957

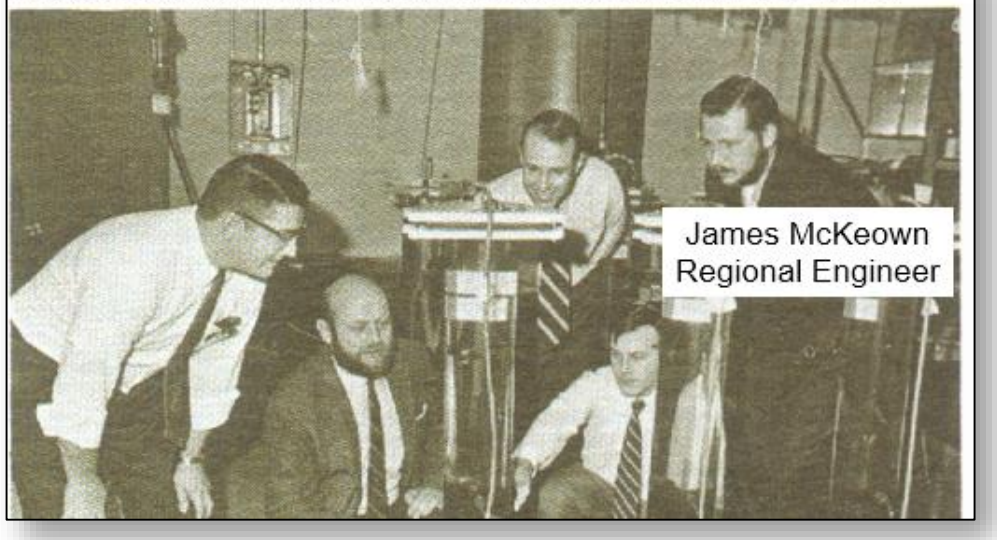
ATMOSPHERIC POLLUTION
TECHNICAL BULLETIN

Number 1

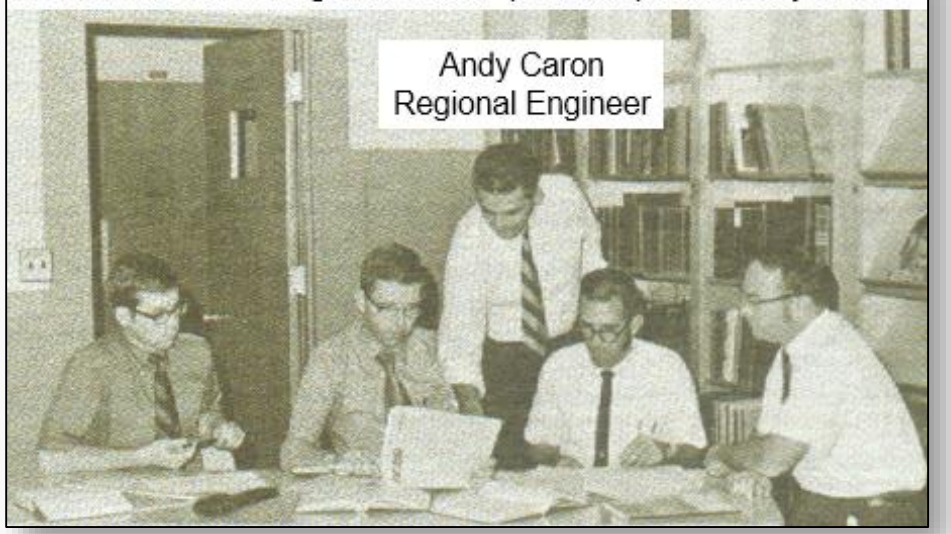
SAMPLING AND ANALYSIS OF AIR-BORNE
GASEOUS EFFLUENTS RESULTING FROM SULFATE PULPING

# Early 1970s Regional Staff

NCASI Northeast Regional Center (Boston) Staff : Early 1970s




NCASI Northwest Regional Center (Corvallis) Staff: Early 1970s




NCASI Southern Regional Center (Gainesville) Staff: Early 1970s


NCASI Central-Lake States Regional Center (Kalamazoo) Staff
Early 1970s

# The environmental movement comes to life

- 1962: Rachel Carson's "Silent Spring"
- 1967: Bald Eagle declared endangered
- 1969: Cuyahoga River Catches Fire (again)
- 1970: First Earth Day


CLEVELAND PLAIN DEALER

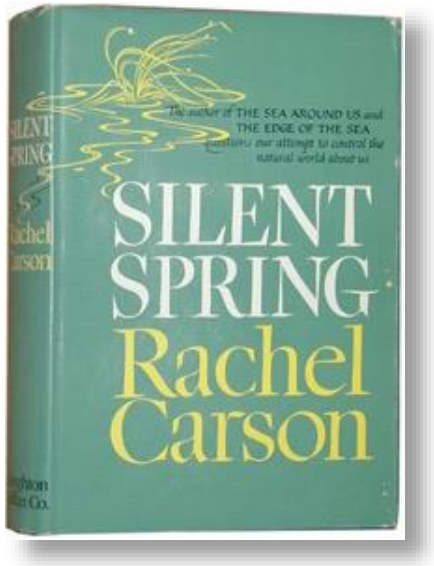
OIL SLICK FIRE RUINS FLATS SHIPYARD

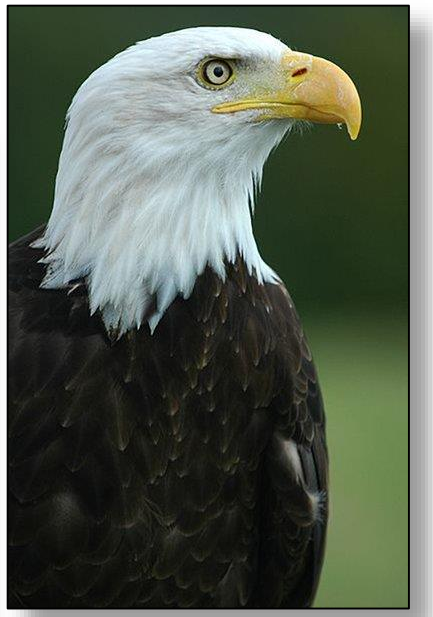
Surly Ohio Pen Rebels Fed at Gunpoint

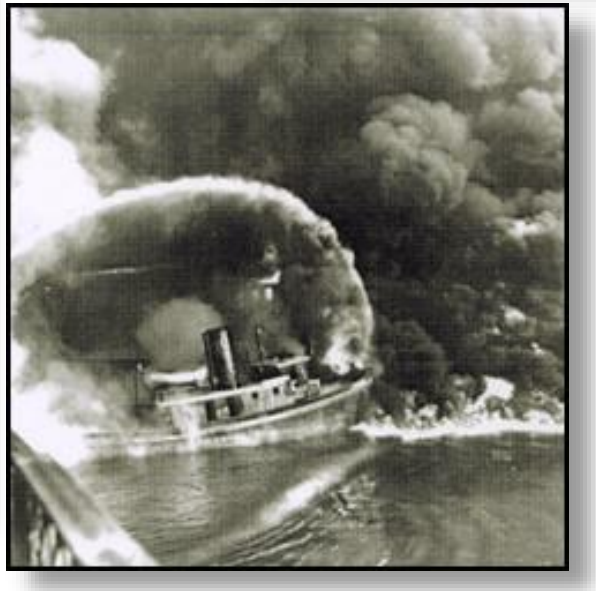
PRISON GETS FIRST QUIET AFTER RIOTS

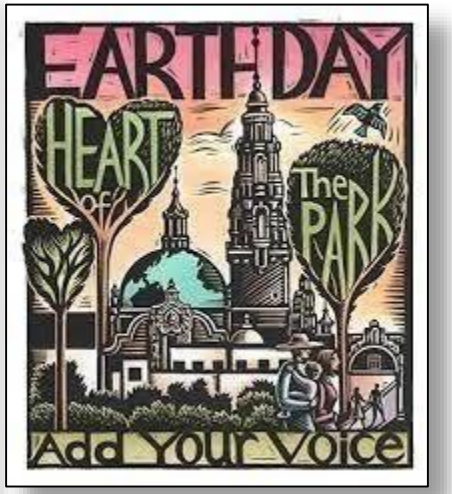
1948 CASTS A VEIL OVER 'IKE TO WIN'

FLAMES HIT DRY DOCKS, THREE TUGS

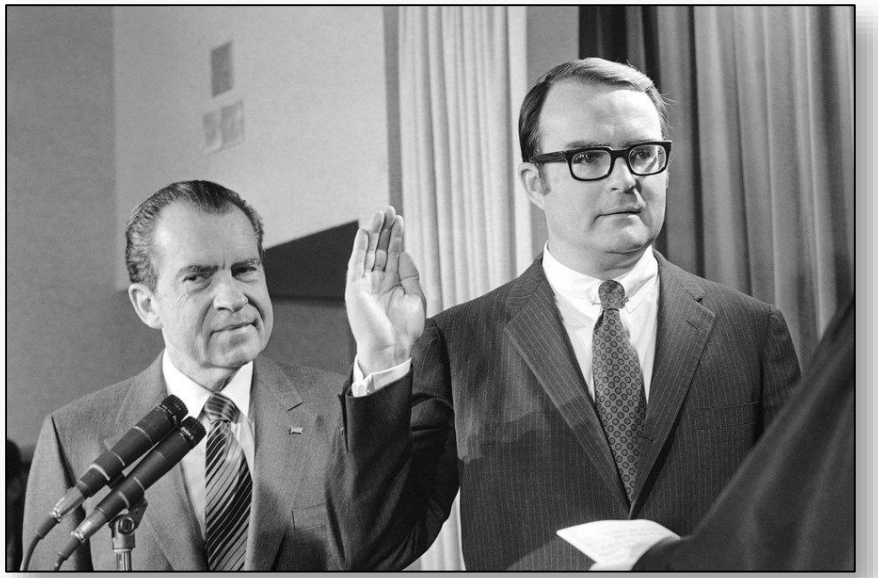






# 1970s sees a torrent of legislation

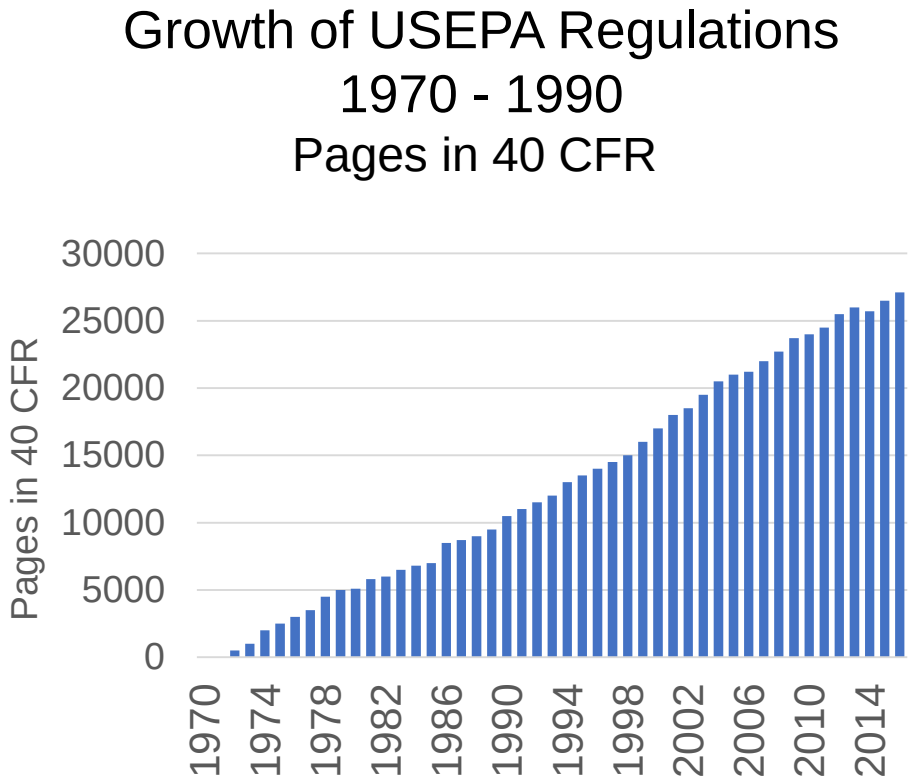


William Ruckelshaus sworn in as first EPA Administrator. He would later serve as Senior Vice President for Law and Corporate Affairs for Weyerhaeuser from 1976 to 1983.

- 1970: Nixon Administration creates EPA
- And the legislation flows
  - Clean Air Act of 1970
  - Federal Water Pollution Control Act Amendments of 1972
  - Endangered Species Act in 1973
  - Safe Drinking Water Act in 1974
  - Resources Conservation and Recovery Act (RCRA) of 1976
  - Toxic Substances Control Act (TSCA) of 1976
  - Clean Air Act Amendments of 1977
  - Clean Water Act of 1977

# Where there is legislation, rules will follow

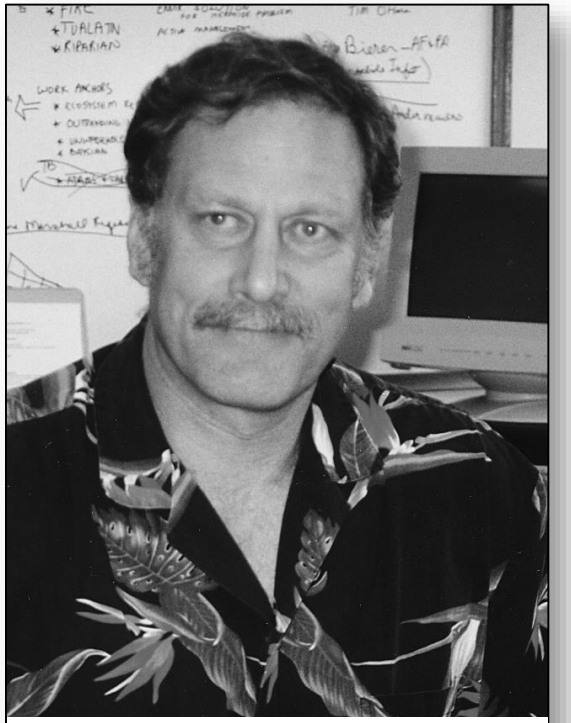
- EPA more than quadruples in size between 1970 and 1990
- These initiatives produces a steady stream of technical and scientific questions
- The industry asks NCASI to be involved with the objectives of:
  - Seeking regulations that were science-based
  - Allowing cost-effective compliance
- To allow an effective response, NCASI doubles in size between 1970 and 1990




Source: Wharton Initiative for Global Environmental Leadership, available at https://whartonigel.wordpress.com/2017/04/10/u-s-environmental-regulatory-trends-past-present-and-future/ - Data read from graph in report

# Forestry practices come under scrutiny

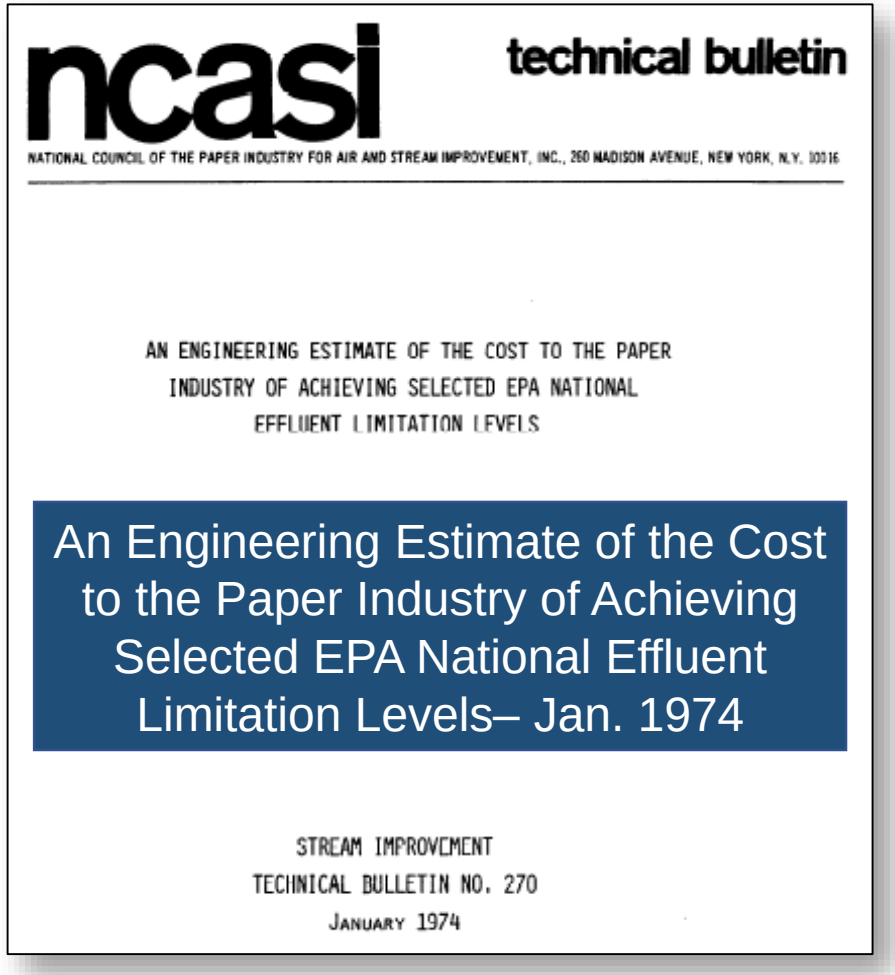
- 1972 Clean Water Act drew attention to non-point sources
- By 1977, it was clear that additional science was needed
- The National Forest Products Association decides to fund a position at NCASI
- Dr. George Ice hired 1977



Dr. George Ice
NCASI 1977 – ret. 2012

# 1970s and 1980s : Water Success Stories

- NCASI data influence EPA's first limits on BOD and TSS from the industry
- The "Flannery Settlement" results in NCASI's working with EPA to develop data on 129 "priority pollutants"
  - Result: EPA decides that universal limits on these chemicals are not needed
- 1977 Clean Water Act amendments call for tightened BOD and TSS limits based on "cost reasonableness"
  - NCASI's analysis of EPA's proposed cost test reveals significant shortcomings
  - EPA revised the cost test, ultimately showing that tighter limits on the industry were not cost reasonable


ncasi technical bulletin

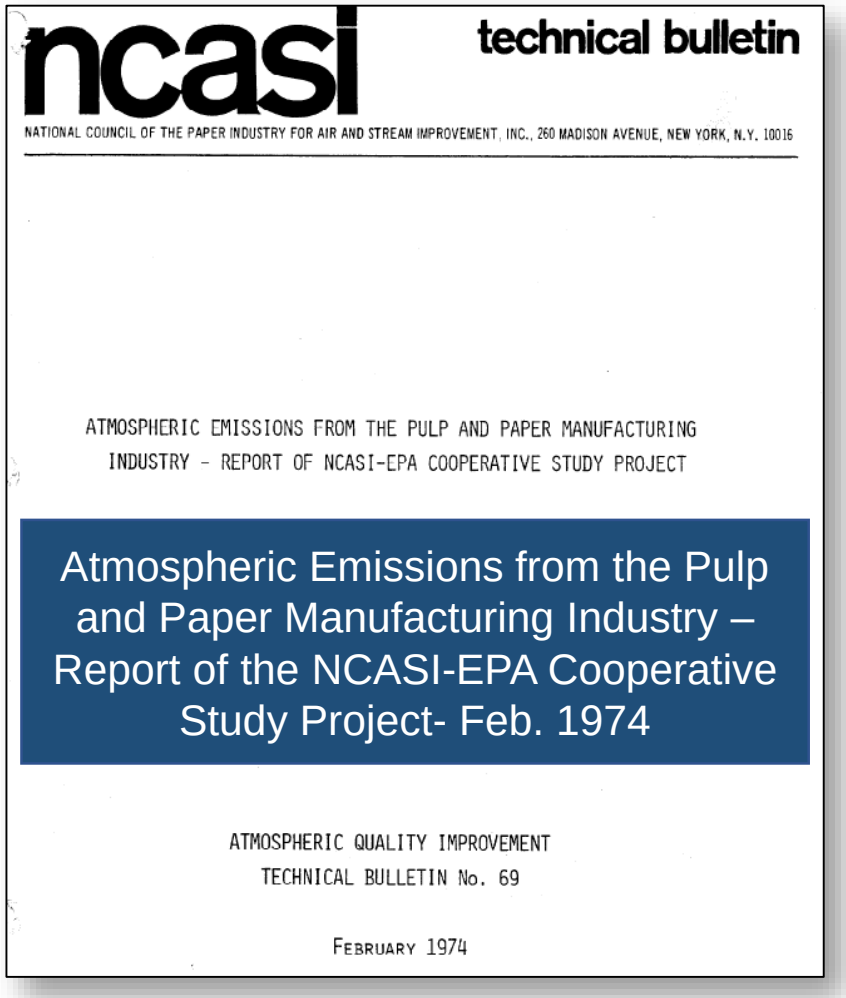
NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

AN ENGINEERING ESTIMATE OF THE COST TO THE PAPER INDUSTRY OF ACHIEVING SELECTED EPA NATIONAL EFFLUENT LIMITATION LEVELS

STREAM IMPROVEMENT
TECHNICAL BULLETIN NO. 270
JANUARY 1974

An Engineering Estimate of the Cost to the Paper Industry of Achieving Selected EPA National Effluent Limitation Levels– Jan. 1974

# 1970s and 1980s : Air Success Stories



ncasi technical bulletin

NATIONAL COUNCIL OF THE PAPER INDUSTRY FOR AIR AND STREAM IMPROVEMENT, INC., 260 MADISON AVENUE, NEW YORK, N.Y. 10016

ATMOSPHERIC EMISSIONS FROM THE PULP AND PAPER MANUFACTURING INDUSTRY - REPORT OF NCASI-EPA COOPERATIVE STUDY PROJECT

Atmospheric Emissions from the Pulp and Paper Manufacturing Industry – Report of the NCASI-EPA Cooperative Study Project- Feb. 1974

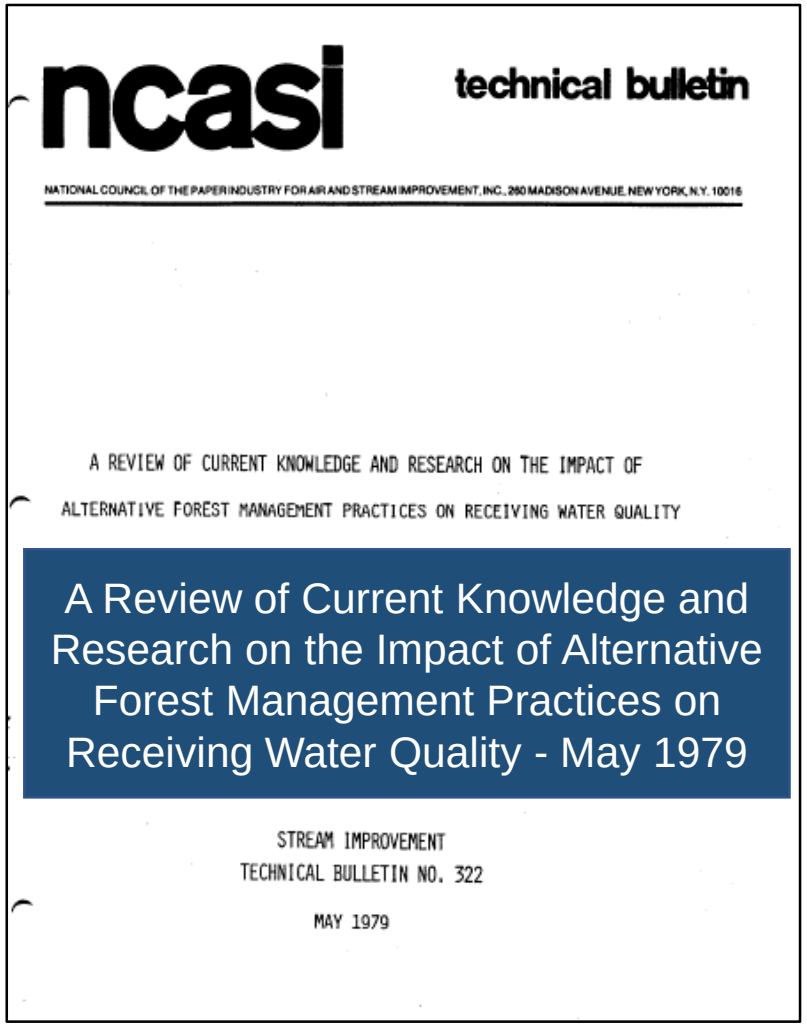
ATMOSPHERIC QUALITY IMPROVEMENT
TECHNICAL BULLETIN No. 69

FEBRUARY 1974

- 1970s: EPA and NCASI conduct a cooperative study to define the control capabilities of technologies for New Source Performance Standards (NSPS) for Kraft Mills
- 1970s and 1980s: NCASI assembles performance data to assist states with responsibility for regulating emissions from existing kraft mills
- Early-Mid 1980s: EPA-proposed revisions to kraft mill NSPS influenced by detailed data and comments prepared by NCASI

# 1970s and 1980s : Forestry Success Stories

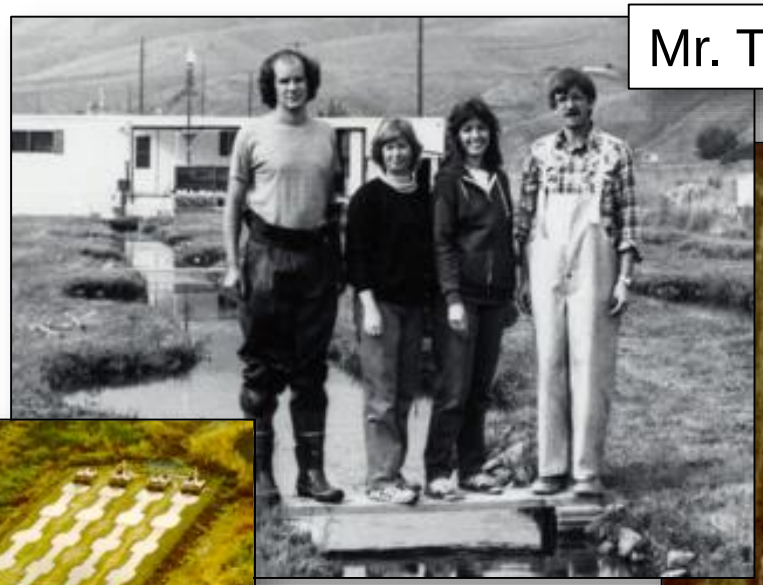
- 1970s:  With passage of the Clean Water Act, states initiated programs to control nonpoint source pollution.  NCASI and NFPA cooperated to assemble existing information and research about the impacts of forest management practices on receiving water quality and utility
- 1980s: In response to concerns that acidic deposition was adversely affecting forest health and productivity, NCASI reviewed the state of knowledge and initiated studies to fill important information gaps



# 1970s: NCASI adds Aquatic Biology Expertise

- Experimental streams constructed in New Bern NC, and Lewiston ID

Dr. Dennis Borton



Mr. Tim Hall and Staff

New Bern streams

Lewiston streams

# Forest-related challenges multiply

- The 1980s and 90s: A proliferation of new research needs related to
  - Water Quality, Wetlands Protection, BMPs
  - Threatened and Endangered Species
    - Dr. Larry Irwin hired 1986
  - Acid Rain and Forest Productivity
  - Sustainable Forest Management Certification
  - Forest Chemicals
  - Carbon and Climate
  - And more
- NCASI's forestry research grows to 25% of NCASI's program
- Directed by Dr. Alan Lucier
  - Hired as Program Manager, 1983
  - Senior Vice President, NCASI 1995 - 2014

Dr. Larry Irwin
NCASI 1986- ret. 2014

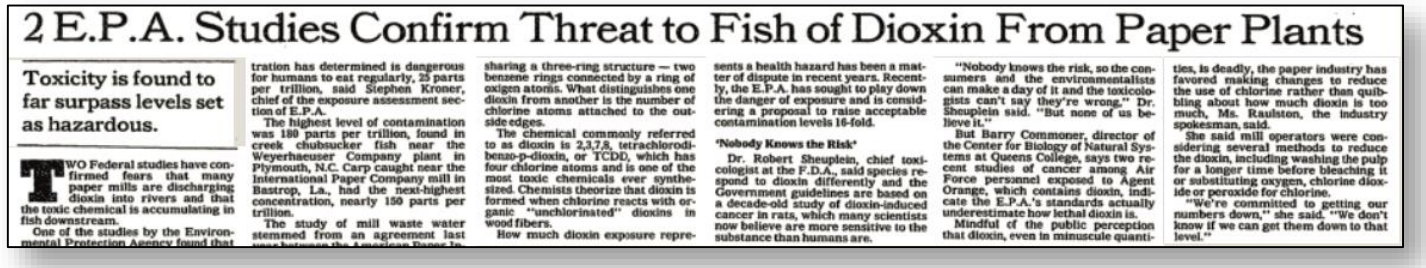
Dr. Alan Lucier
NCASI, 1983 - 2014

# Dioxin becomes a national issue

- 1970s: Agent Orange defoliant used in Viet Nam – Dioxin (2,3,7,8-TCDD) is a contaminant
- 1978: Love Canal described as "a public health time bomb"
- 1980s Dioxin headlines (“the most toxic chemical known to man”)
- 1983 Times Beach Missouri evacuated and abandoned
- By-product of chemical production
- No connection to our industry until…

# The surprise link to chlorine in pulp bleaching

- Late 1980s, EPA conducts National Dioxin Study
- Surprise finding of elevated TCDD levels in fish from several rivers selected *to establish background levels and in several mill sludges*
- Some of the rivers received effluents from bleached chemical pulp mills
- Subsequent studies found TCDD in some products containing bleached chemical pulp



2 E.P.A. Studies Confirm Threat to Fish of Dioxin From Paper Plants

Toxicity is found to far surpass levels set as hazardous.

TWO Federal studies have confirmed fears that many paper mills are discharging dioxin into rivers and that the toxic chemical is accumulating in fish downstream.

One of the studies by the Environmental Protection Agency found that tration has determined is dangerous for humans to eat regularly, 25 parts per trillion, said Stephen Kroner, chief of the exposure assessment section of E.P.A.

The highest level of contamination was 180 parts per trillion, found in creek chubsucker fish near the Weyerhaeuser Company plant in Plymouth, N.C. Carp caught near the International Paper Company mill in Bastrop, La., had the next-highest concentration, nearly 150 parts per trillion.

The study of mill waste water stemmed from an agreement last

sharing a three-ring structure — two benzene rings connected by a ring of oxigen atoms. What distinguishes one dioxin from another is the number of chlorine atoms attached to the outside edges.

The chemical commonly referred to as dioxin is 2,3,7,8, tetrachlorodibenzo-p-dioxin, or TCDD, which has four chlorine atoms and is one of the most toxic chemicals ever synthesized. Chemists theorize that dioxin is formed when chlorine reacts with organic "unchlorinated" dioxins in wood fibers.

How much dioxin exposure represents a health hazard has been a matter of dispute in recent years. Recently, the E.P.A. has sought to play down the danger of exposure and is considering a proposal to raise acceptable contamination levels 16-fold.

**'Nobody Knows the Risk'**

Dr. Robert Sheuplein, chief toxicologist at the F.D.A., said species respond to dioxin differently and the Government guidelines are based on a decade-old study of dioxin-induced cancer in rats, which many scientists now believe are more sensitive to the substance than humans are.

"Nobody knows the risk, so the consumers and the environmentalists can make a day of it and the toxicologists can't say they're wrong," Dr. Sheuplein said. "But none of us believe it."

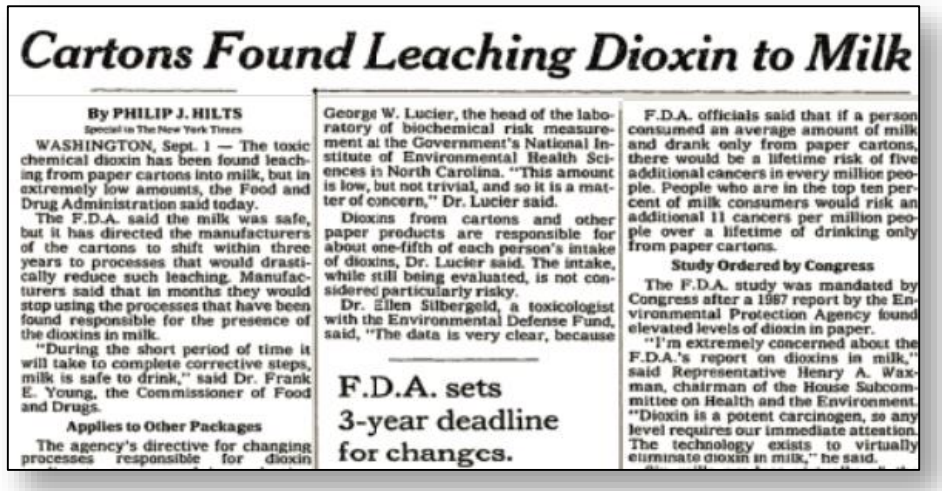
But Barry Commoner, director of the Center for Biology of Natural Systems at Queens College, says two recent studies of cancer among Air Force personnel exposed to Agent Orange, which contains dioxin, indicate the E.P.A.'s standards actually underestimate how lethal dioxin is.

Mindful of the public perception that dioxin, even in minuscule quanti-

ties, is deadly, the paper industry has favored making changes to reduce the use of chlorine rather than quibbling about how much dioxin is too much, Ms. Raulston, the industry spokesman, said.

She said mill operators were considering several methods to reduce the dioxin, including washing the pulp for a longer time before bleaching it or substituting oxygen, chlorine dioxide or peroxide for chlorine.

"We're committed to getting our numbers down," she said. "We don't know if we can get them down to that level."



Cartons Found Leaching Dioxin to Milk

By PHILIP J. HILTS
Special to The New York Times

WASHINGTON, Sept. 1 — The toxic chemical dioxin has been found leaching from paper cartons into milk, but in extremely low amounts, the Food and Drug Administration said today.

The F.D.A. said the milk was safe, but it has directed the manufacturers of the cartons to shift within three years to processes that would drastically reduce such leaching. Manufacturers said that in months they would stop using the processes that have been found responsible for the presence of the dioxins in milk.

"During the short period of time it will take to complete corrective steps, milk is safe to drink," said Dr. Frank E. Young, the Commissioner of Food and Drugs.

**Applies to Other Packages**

The agency's directive for changing processes responsible for dioxin

George W. Lucier, the head of the laboratory of biochemical risk measurement at the Government's National Institute of Environmental Health Sciences in North Carolina. "This amount is low, but not trivial, and so it is a matter of concern," Dr. Lucier said.

Dioxins from cartons and other paper products are responsible for about one-fifth of each person's intake of dioxins, Dr. Lucier said. The intake, while still being evaluated, is not considered particularly risky.

Dr. Ellen Silbergeld, a toxicologist with the Environmental Defense Fund, said, "The data is very clear, because

F.D.A. sets 3-year deadline for changes.

F.D.A. officials said that if a person consumed an average amount of milk and drank only from paper cartons, there would be a lifetime risk of five additional cancers in every million people. People who are in the top ten percent of milk consumers would risk an additional 11 cancers per million people over a lifetime of drinking only from paper cartons.

**Study Ordered by Congress**

The F.D.A. study was mandated by Congress after a 1987 report by the Environmental Protection Agency found elevated levels of dioxin in paper.

"I'm extremely concerned about the F.D.A.'s report on dioxins in milk," said Representative Henry A. Waxman, chairman of the House Subcommittee on Health and the Environment. "Dioxin is a potent carcinogen, so any level requires our immediate attention. The technology exists to virtually eliminate dioxin in milk," he said.

Traces of Dioxin Found in Range Of Paper Goods

By PHILIP SHABECOFF
Special to The New York Times

WASHINGTON, Sept. 23 — Traces of the toxic chemical dioxin have been found in a wide range of paper products, industry officials said today.

Although minute dioxin contamination of paper could be pervasive, the industry studies said, they specifically mentioned food packaging, disposable diapers, tampons and paper tissue as tainted. Studies of these and other paper products are continuing.

Any product made from pulp contaminated with dioxin would likely contain it, industry spokesmen said. They

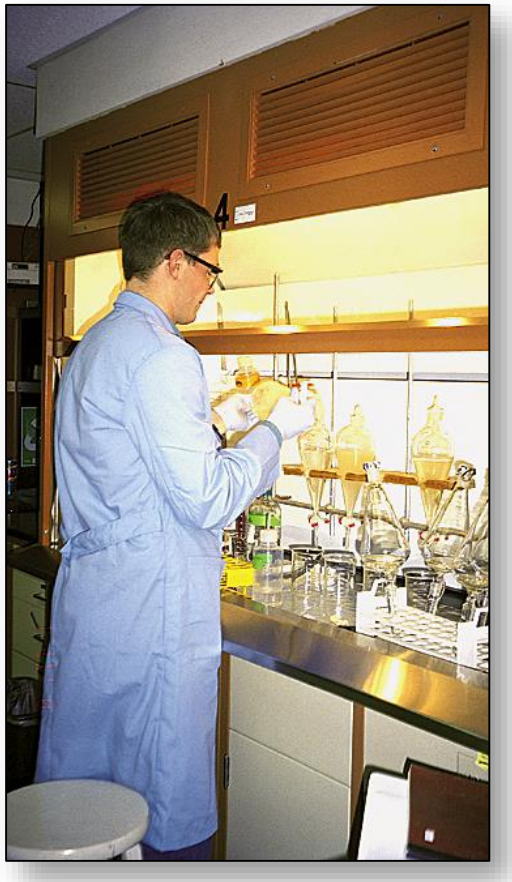
All headlines from New York Times

# An “All Hands on Deck” Moment

- AF&PA leads policy and market response
- Technical studies by NCASI, IPST at Georgia Tech & others
- At least 100 NCASI reports on dioxin issued between 1985 and 1995
  - Sampling and measurement methods
  - Collaborative studies with EPA: 5-mill screening study and a subsequent study of effluent, sludge and pulp at all bleached chemical pulp mills (the 104-mill study)
  - 22 bleach line “intensive study”, to gain an understanding of mechanisms of TCDD/TCDF formation
  - Studies of pulps, products and potential migration into foodstuffs
  - Studies of workplace exposure
  - Several projects examining other aspects the dioxin issue

# A path forward is found

- Laboratory and field studies confirmed that TCDD and TCDF formation could be virtually eliminated by using elemental chlorine free (ECF) bleaching sequences
  - The formation of a number of other potentially problematic chlorinated compounds was also dramatically reduced
- Industry agreed to voluntarily convert to ECF bleaching, at a cost of over 2 billion dollars.
- In mid-1990s, EPA promulgated effluent limits consistent with ECF mill performance
- While it was expensive, the “dioxin issue” was put to rest



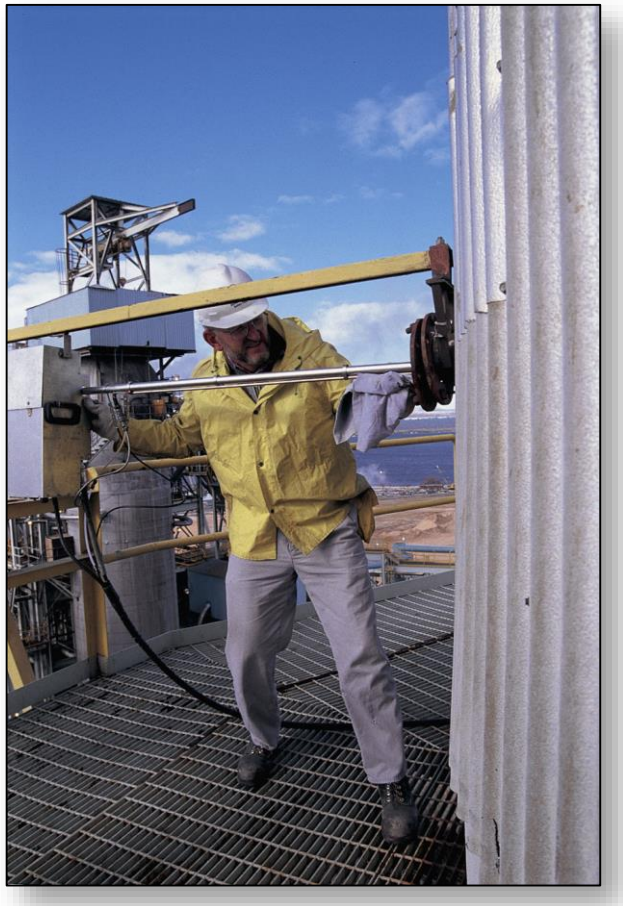
# 1994: The first change at the helm in 27 years

- Dr. Ron Yeske named President of NCASI
- Dr. Alan Lucier named Senior Vice President
- Vice Presidents are named
  - William Gillespie – Water
  - Dr. Alan Lucier – Forestry
  - Reid Miner – Pollution Prevention
  - Dr. John Pinkerton – Air
- Headquarters relocated to North Carolina
- Business Operations Professionalized
- Staff Resources Realigned to Increase NCASI's effectiveness
- Encouragement to pursue new ideas and abandon those that are not working

Dr. Ron Yeske,
NCASI President 1994 – ret. 2015

# Air issues move to center stage

- Clean Air Act Amendments of 1990 direct EPA to establish Maximum Achievable Control Technology (MACT) Standards
- EPA lacks the resources to develop mill data needed to establish valid standards so industry authorizes multi-million dollar sampling program managed by NCASI
- Late 1990s: The wood products industry encounters the same situation and authorizes an extensive sampling program at 29 mills



# 2002: NCASI Becomes International

- Canadian Office opened in Montreal
- Kirsten Vice Named Vice President – Canadian Operations
- Canadian membership quickly grows to represent over half of the pulp and paper production in Canada
- Staff added to address range of forestry, water, air and sustainability issues
  - And to leverage the large amount of NCASI work performed in the U.S.

Kirsten Vice
VP – Sustainable Manufacturing & Canadian Operations

# When the MACT dust had settled…

- Data-driven control-technology standards for HAPs and options to reuse clean condensates
- Emission control standards for paper machines not required
- Work practice standards for Dioxins/Furans and achievable standards for mercury
- Pulp and paper MACT standards effective at lowering residual risk
- Industry-wide cost-savings due to NCASI technical input = $12+ billion

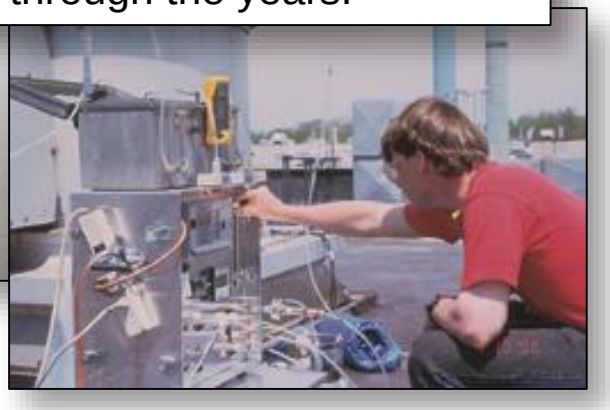
Dr. John Pinkerton

Ashok Jain

# Today, other activities too numerous to cover

- Climate Change
- Carbon Neutrality
- Sustainability
- Life Cycle Assessment
- Chemical Management
- Solid wastes and beneficial use
- Treatment plant optimization
- Water quality and ambient air quality standards
- Bioassay responses
- And more …

Thank you to the many past and present NCASI staff who have not been mentioned but who contributed so much to NCASI's success through the years.



# 2015: Dirk Krouskop named NCASI President

- Appoints Current Senior Staff
  - Tammerah Garren – VP Business Affairs
  - Vipin Varma – VP  Air Quality & Director, Southern Region
  - Kirsten Vice – VP Sustainable Manufacturing & Canadian Operations
  - Paul Wiegand – VP Water Resources & Director, Northern and Western Regions
  - Darren Miller – VP Forestry
  - Ben Wigley – Senior Research Fellow
  - Reid Miner – Senior Research Fellow
- Brings a team-based approach to NCASI
- Focused on enhancing and better communicating NCASI's value proposition
- Preparing NCASI for the next 75 years

Dirk Krouskop,
NCASI President
2015 – Present

# Why NCASI?

- Born of need
- Nurtured by members
- Trusted by stakeholders
- Tested by crisis
- Responsive to change


READY FOR THE NEXT 75 YEARS

# Acknowledgments


- Based in large part on the following material:
  - Gillespie, W.J., 2005, NCASI History
  - NCASI, 2018, Information from NCASI website, www.ncasi.org
  - WEF, 1944, Organization and Activities of the National Council for Stream Improvement (of the Pulp, Paper, and Paperboard Industries) Inc., Sewage Works Journal, Vol. 16, No. 5, Sept. 1944, pp. 962-965, published by Water Environment Federation
  - Winget, R.L., 1966, A definitive history of the National Council for Stream Improvement (of the Pulp, Paper and Paperboard Industries, Inc.): 1943-1966

- Thank you to the many NCASI staff who assisted in pulling this together