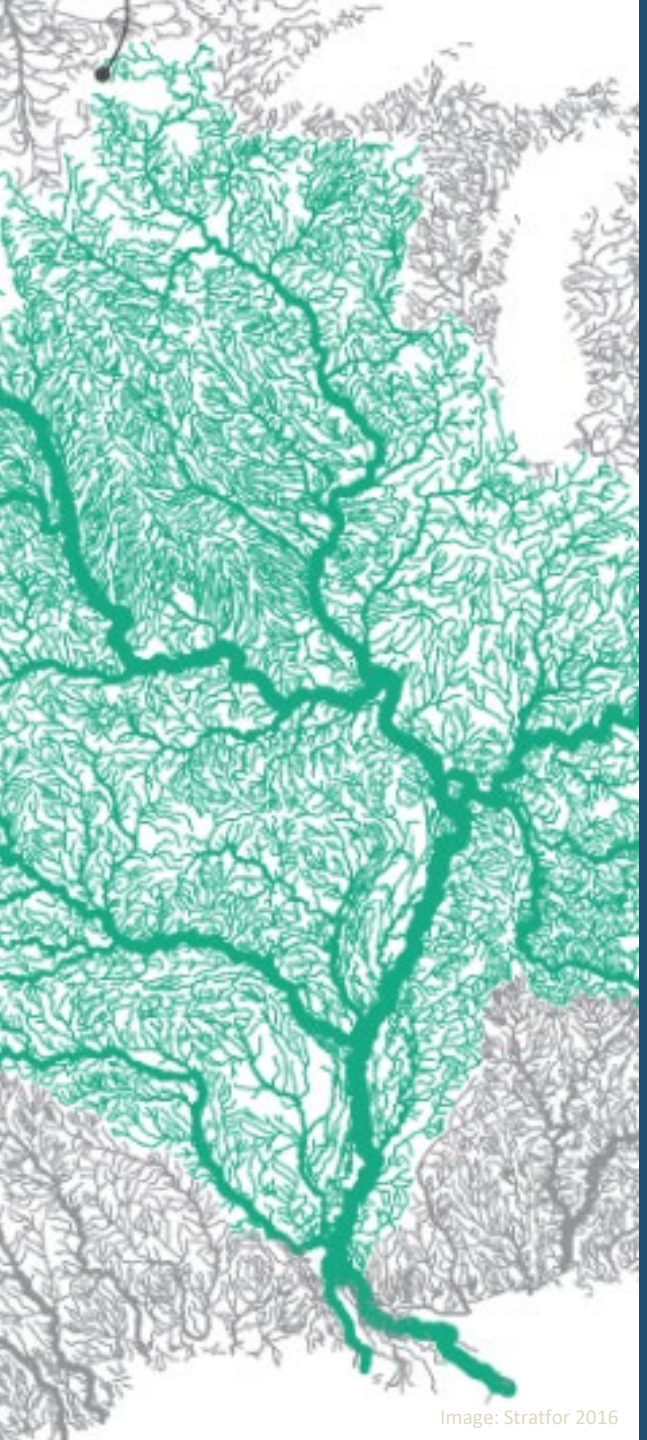
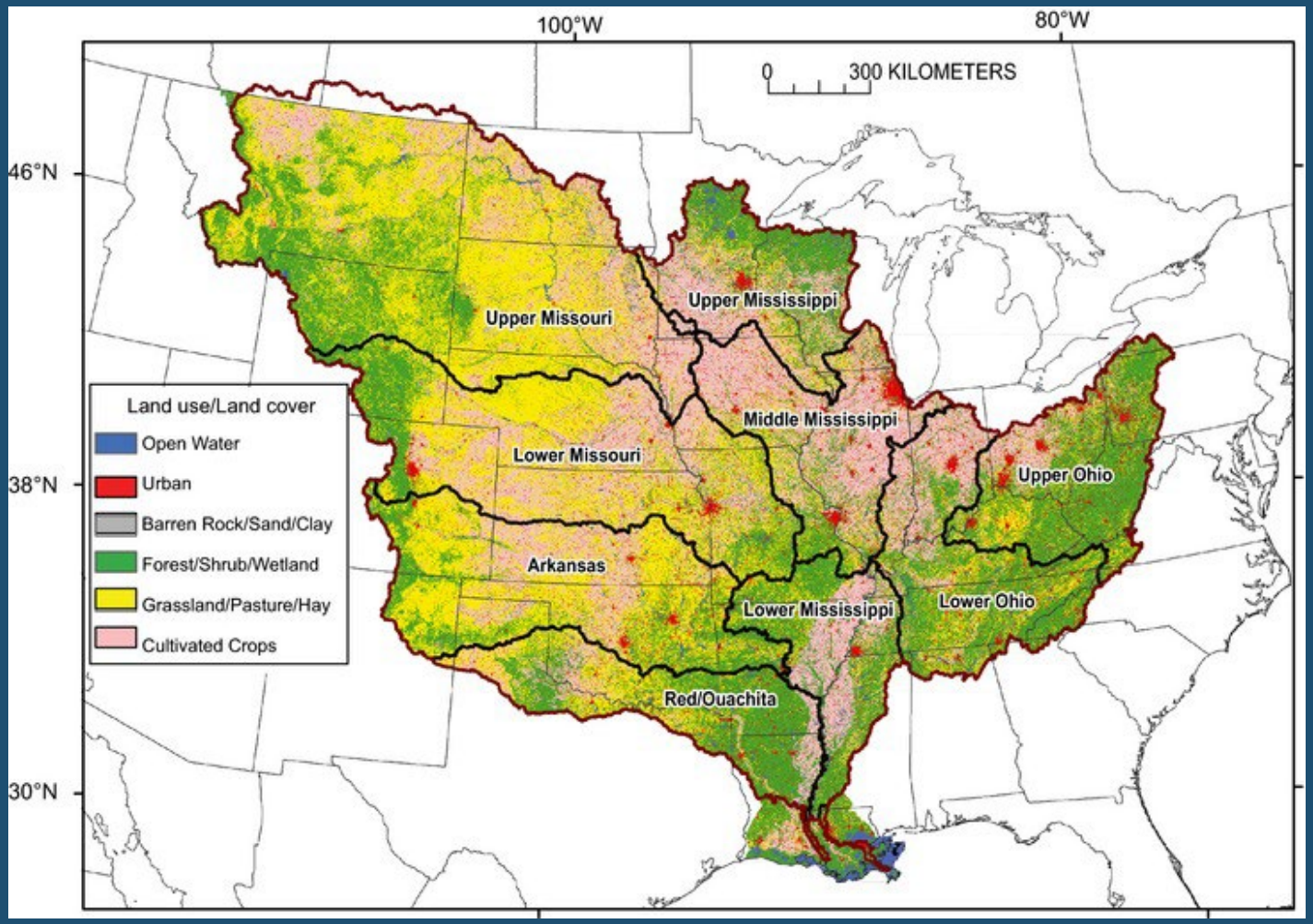


The Gulf Hypoxia Action Plan and the Mississippi River Basin

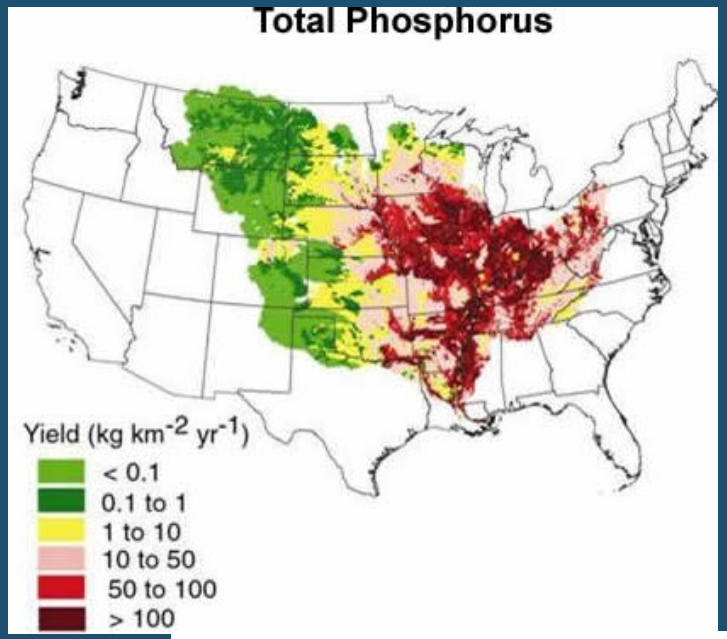
Doug Daigle
Louisiana Hypoxia Working Group

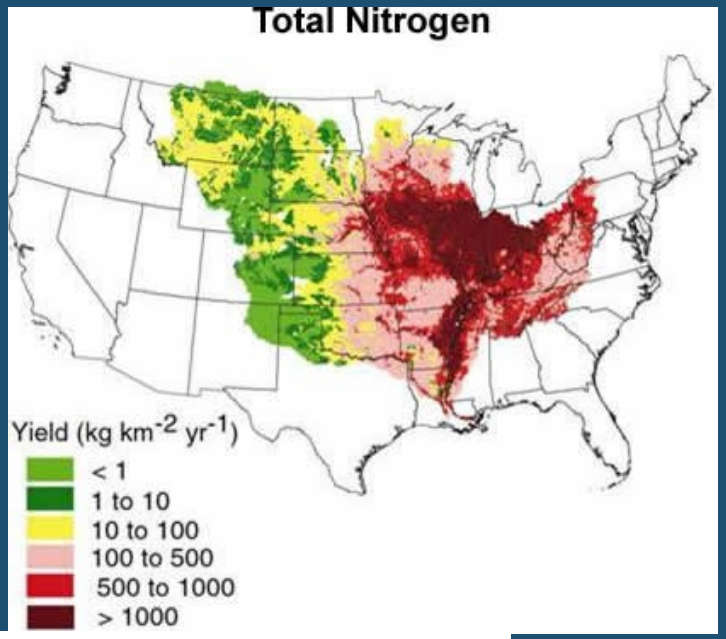
Lambda Alpha
International Land-Water
Webinar

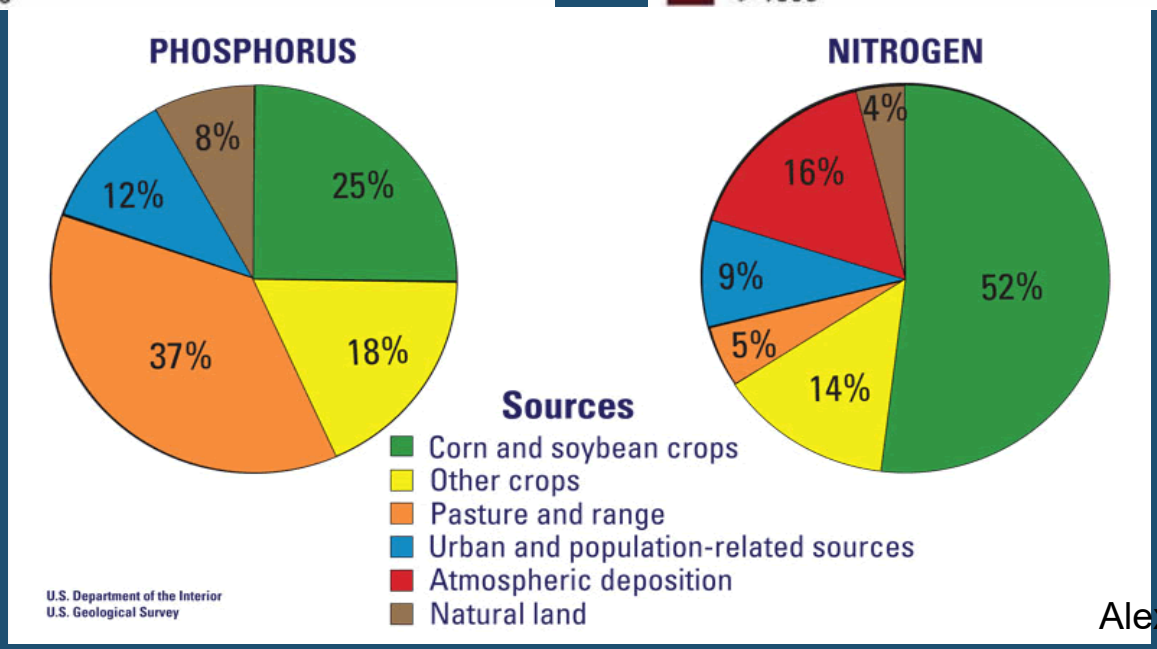
May 28, 2025


100°W
80°W
0
300 KILOMETERS
46°N
38°N
30°N
Land use/Land cover
Open Water
Urban
Barren Rock/Sand/Clay
Forest/Shrub/Wetland
Grassland/Pasture/Hay
Cultivated Crops
Upper Missouri
Upper Mississippi
Middle Mississippi
Lower Missouri
Upper Ohio
Arkansas
Lower Mississippi
Lower Ohio
Red/Ouachita

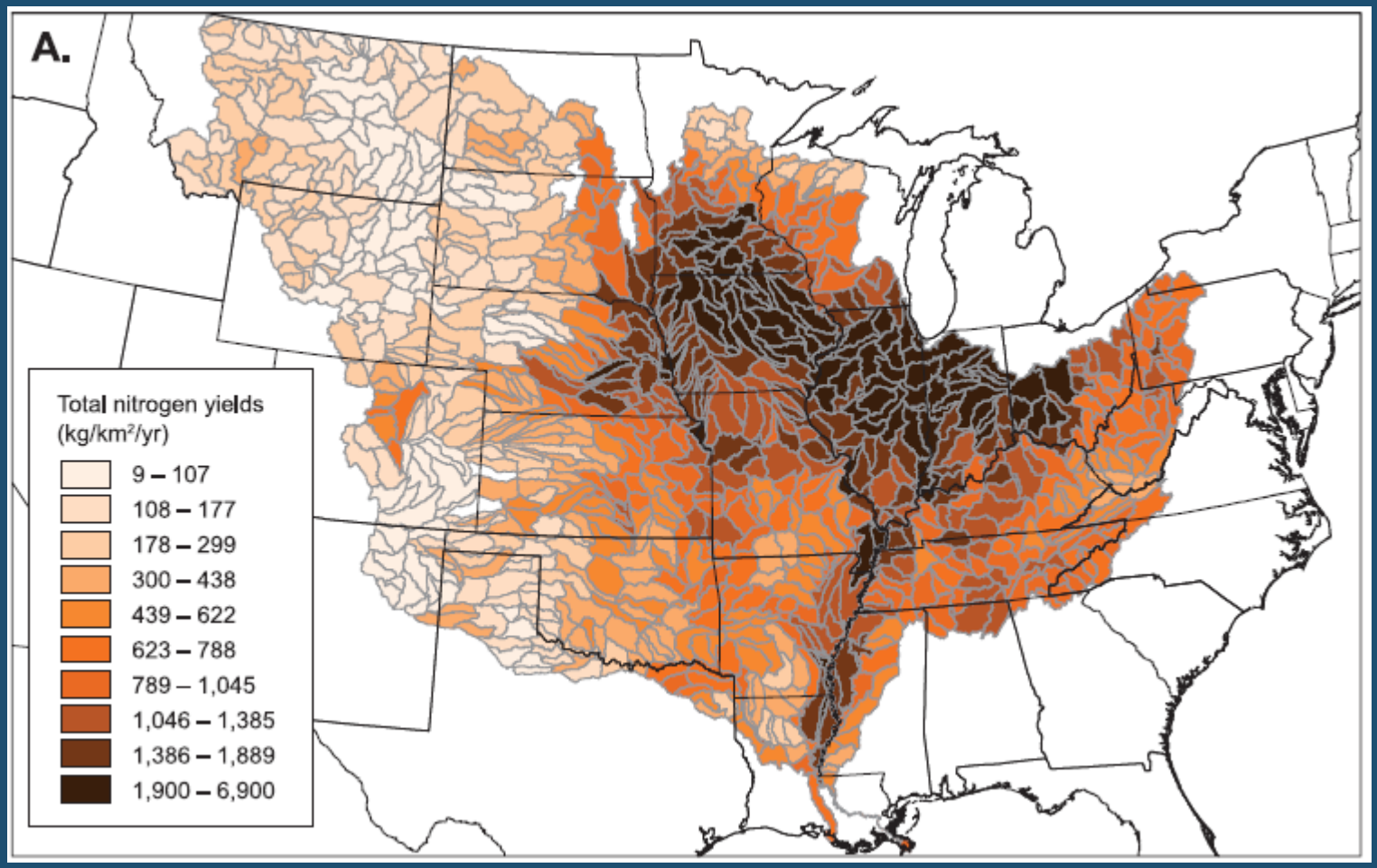
Nutrient Yields from the Mississippi Basin

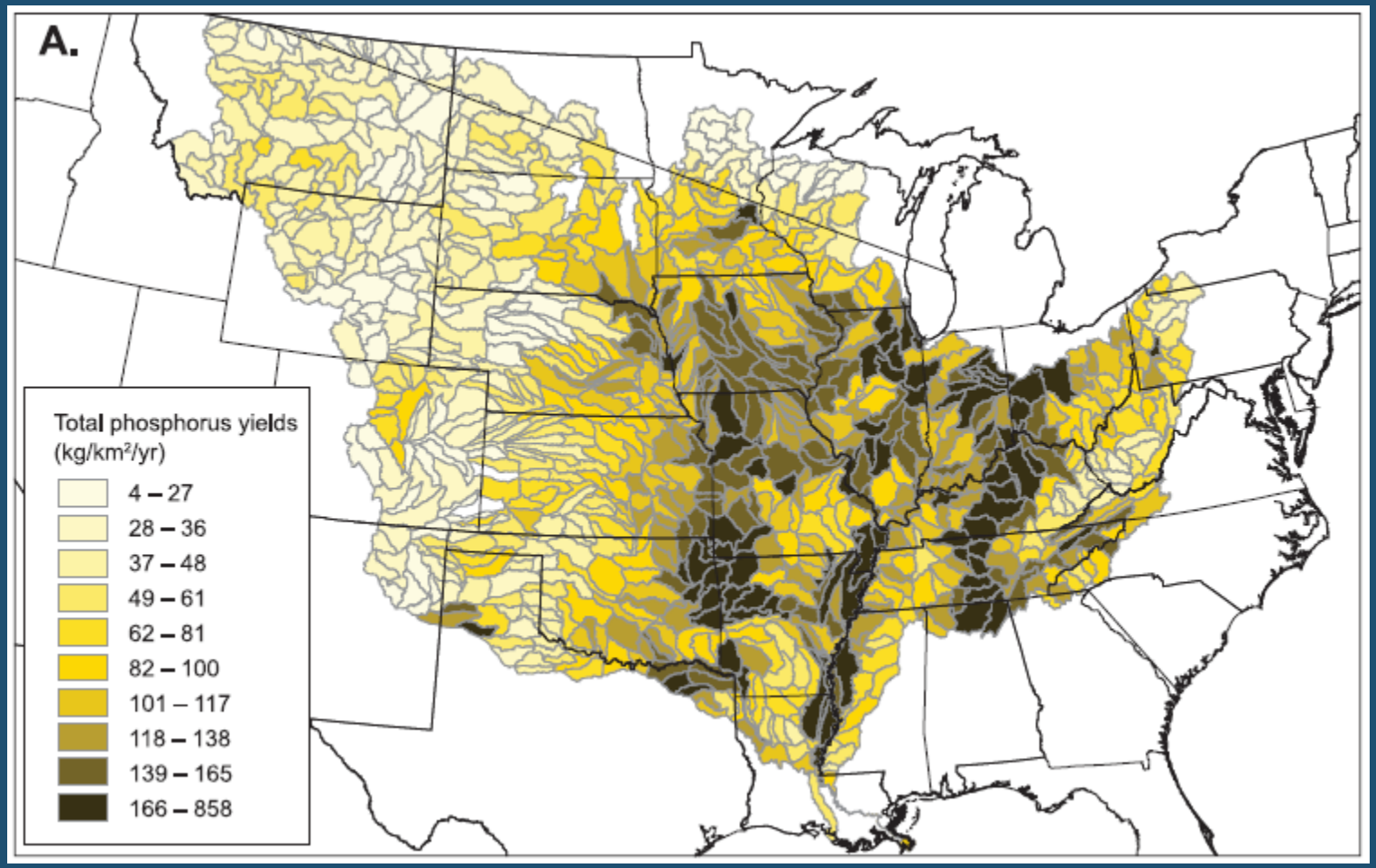




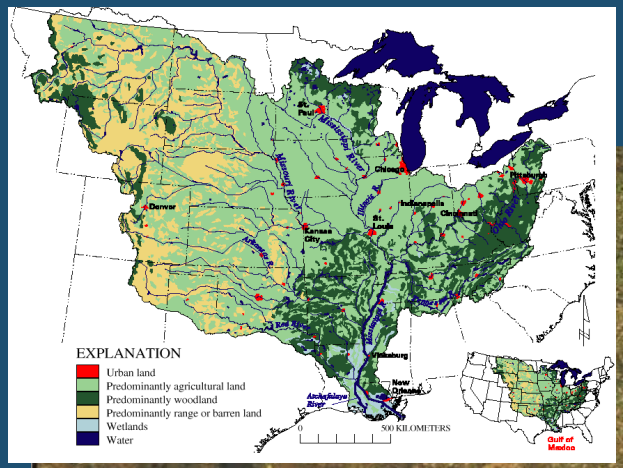


Alexander et al. 2008


A.
Total nitrogen yields
(kg/km²/yr)
9 – 107
108 – 177
178 – 299
300 – 438
439 – 622
623 – 788
789 – 1,045
1,046 – 1,385
1,386 – 1,889
1,900 – 6,900


A.
Total phosphorus yields
(kg/km²/yr)
4 – 27
28 – 36
37 – 48
49 – 61
62 – 81
82 – 100
101 – 117
118 – 138
139 – 165
166 – 858

Mississippi River – Gulf of Mexico Ecosystem Continuum



Mississippi River

Atchafalaya River

New Orleans

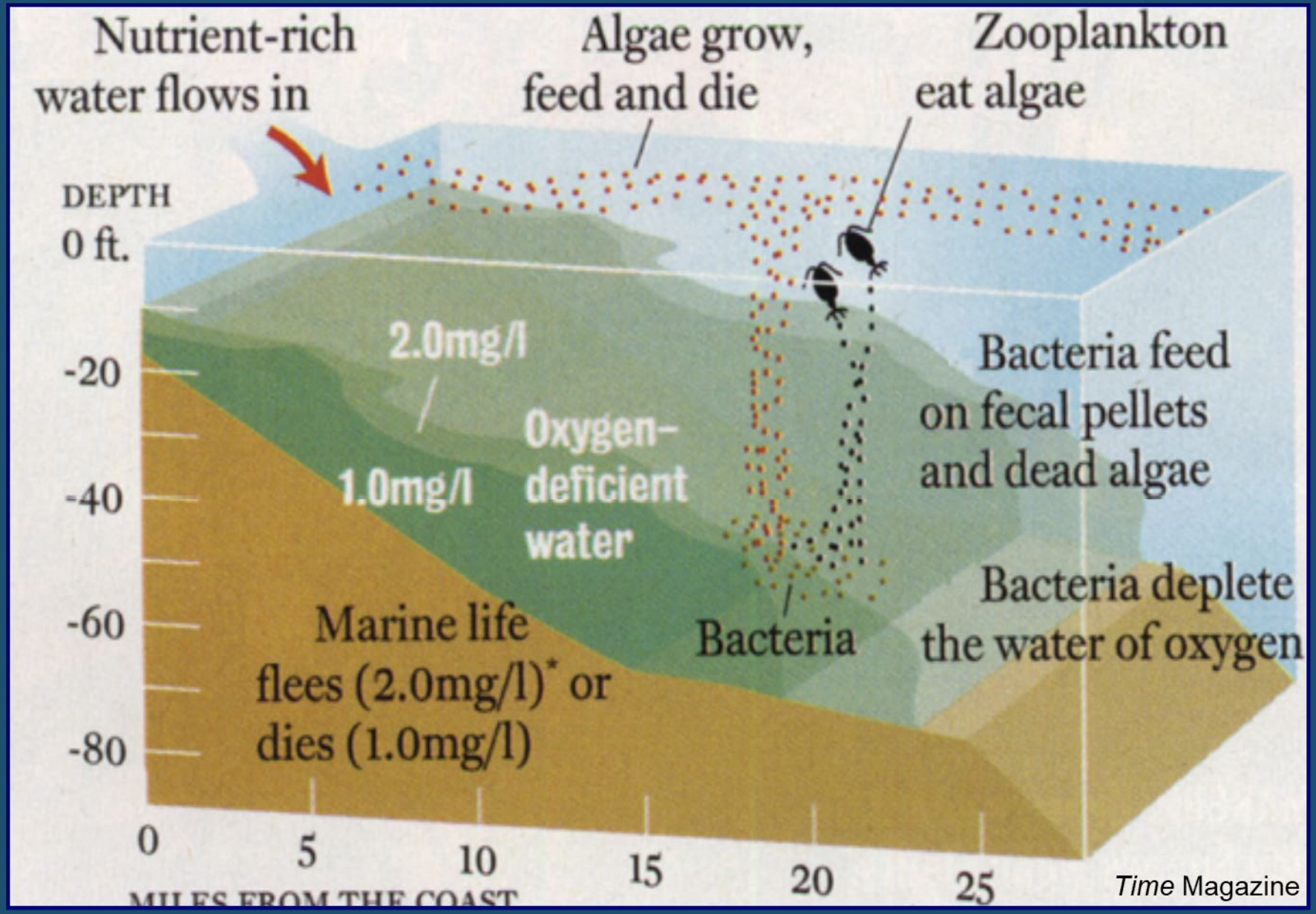
Hypoxic Area

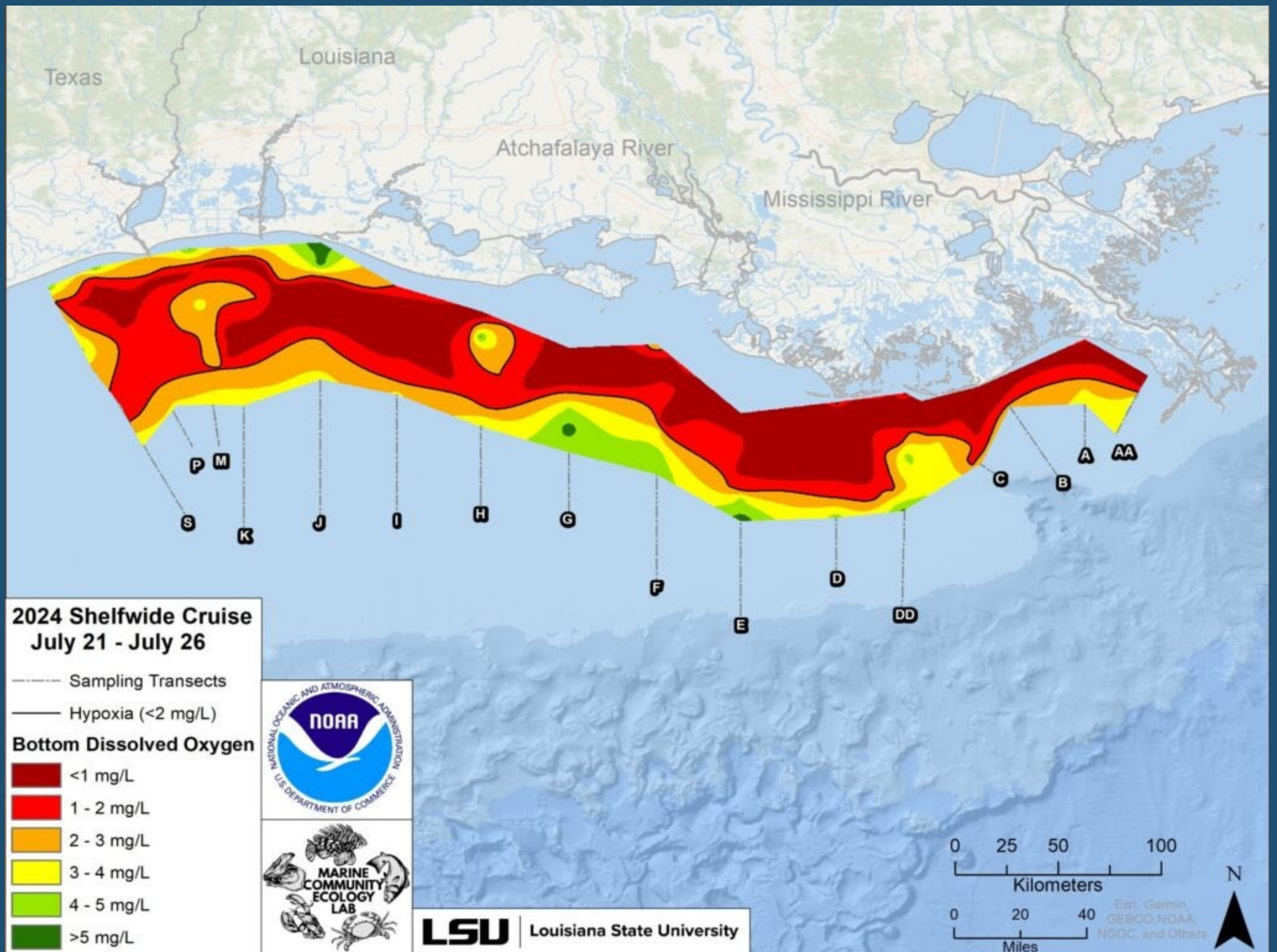
*

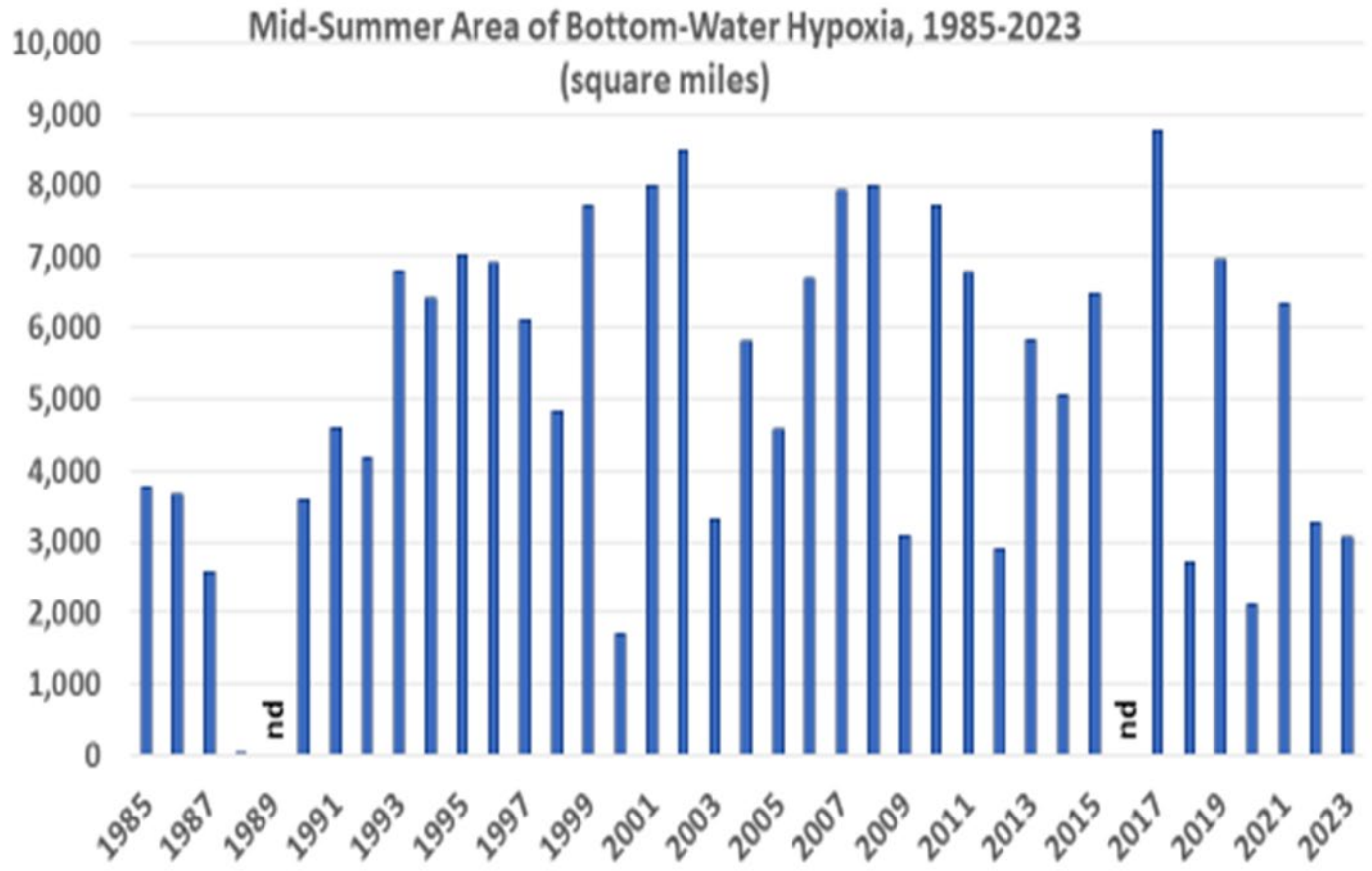
Effects are more far reaching than suspended sediment plume, esp. N & somewhat P

dominant wind direction

Source: N. Rabalais, LUMCON


Nutrient-rich water flows in
Algae grow, feed and die
Zooplankton eat algae
DEPTH
0 ft.
-20
-40
-60
-80
2.0mg/l
1.0mg/l
Oxygen-deficient water
Bacteria feed on fecal pellets and dead algae
Bacteria deplete the water of oxygen
Bacteria
Marine life flees (2.0mg/l)* or dies (1.0mg/l)
0
5
10
15
20
25
MILES FROM THE COAST
Time Magazine


Texas
Louisiana
Atchafalaya River
Mississippi River
P
M
S
K
J
I
H
G
F
E
D
DD
C
B
A
AA
2024 Shelfwide Cruise
July 21 - July 26
Sampling Transects
Hypoxia (<2 mg/L)
Bottom Dissolved Oxygen
<1 mg/L
1 - 2 mg/L
2 - 3 mg/L
3 - 4 mg/L
4 - 5 mg/L
>5 mg/L
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE
MARINE COMMUNITY ECOLOGY LAB
LSU
Louisiana State University
0 25 50 100
Kilometers
0 20 40
Miles
N
Esri, Garmin, GEBCO, NOAA, NGDC, and Others



The size of the area of bottom-water hypoxia (dissolved oxygen less than 2 mg l^{-1}) for 1985-2023, in square miles. "nd" indicates no data—a year without a completely mapped area or no mid-summer shelf wide cruise (1989 & 2016). The area for 1988 is minimal and not visible on the graph.

Gulf Hypoxia Action Plan 2008

for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico and Improving Water Quality in the Mississippi River Basin

Mississippi River Gulf of Mexico Watershed Nutrient Task Force

Action Plan Goal 2015

- We strive to reduce the five-year running average areal extent of the Gulf of Mexico hypoxic zone to less than 5,000 square kilometers/1950 square miles by the year 2035.

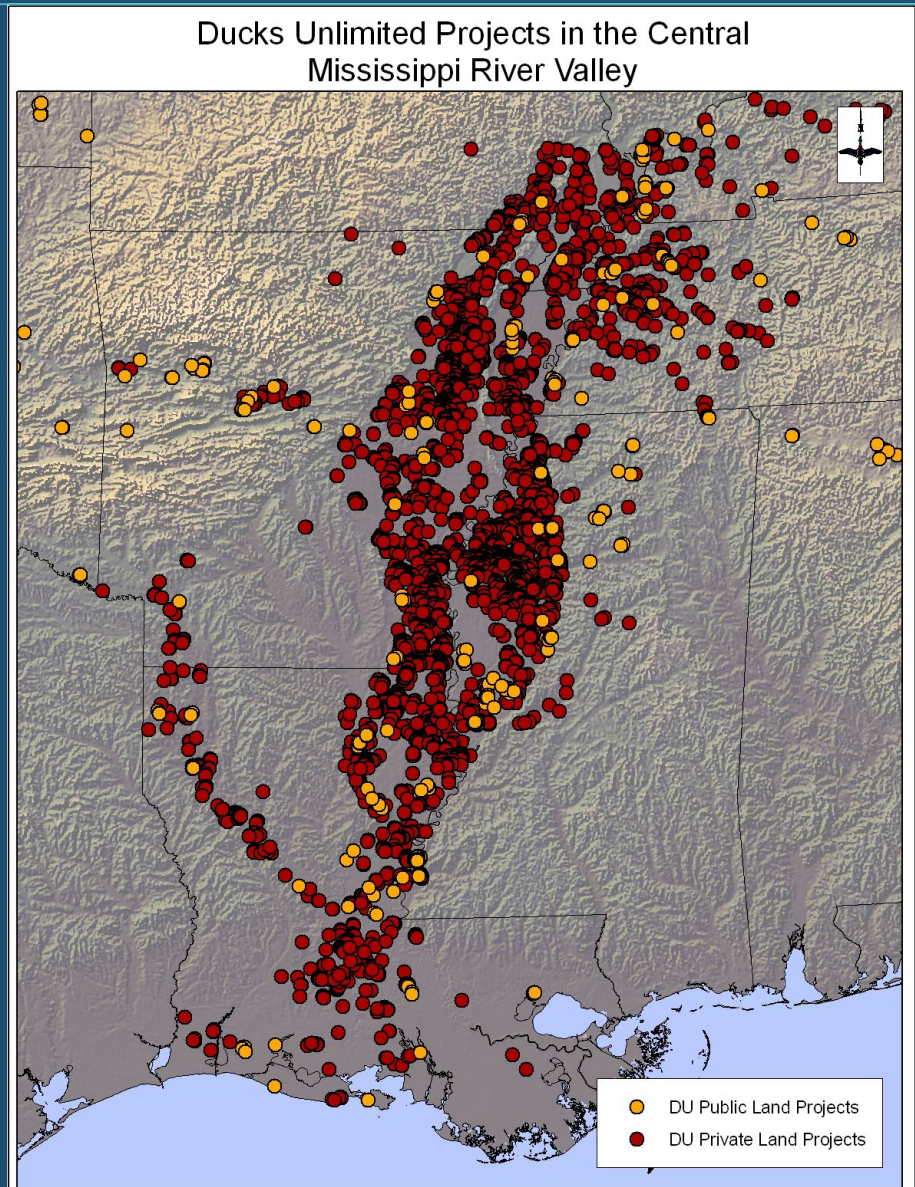
- An Interim Target of a 20% reduction of nitrogen and phosphorus loading [to the Gulf from the MARB] by 2025 is a milestone for immediate planning and implementation actions…

The Gulf Hypoxia Action Plan 2000-2035

- The Gulf Hypoxia Action Plan is analogous to a treaty, with commitments and obligations for signing parties
- Core commitment: to help reach the Plan's Goals
- Baseline requirement for reaching Plan's Goals – adequate if not full funding
- 2025 Target not a priority for the Hypoxia Task Force from 2015 to present – no attempt by HTF or LA to raise implementation funds from Congress

Indirect Funding Sources and Streams for Nutrient Reduction – Collateral Benefits, Related Aims:

- **Federal**: Land and Water Conservation Fund (GAOA); IIJA; IRA
- **WRDA Projects**: UMR Protection Program (UMRBA, UMRCC), LMR Restoration Study (LMRCC)
- **Private-Public/Private**: CF, DU, NFWF, TNC, TPL

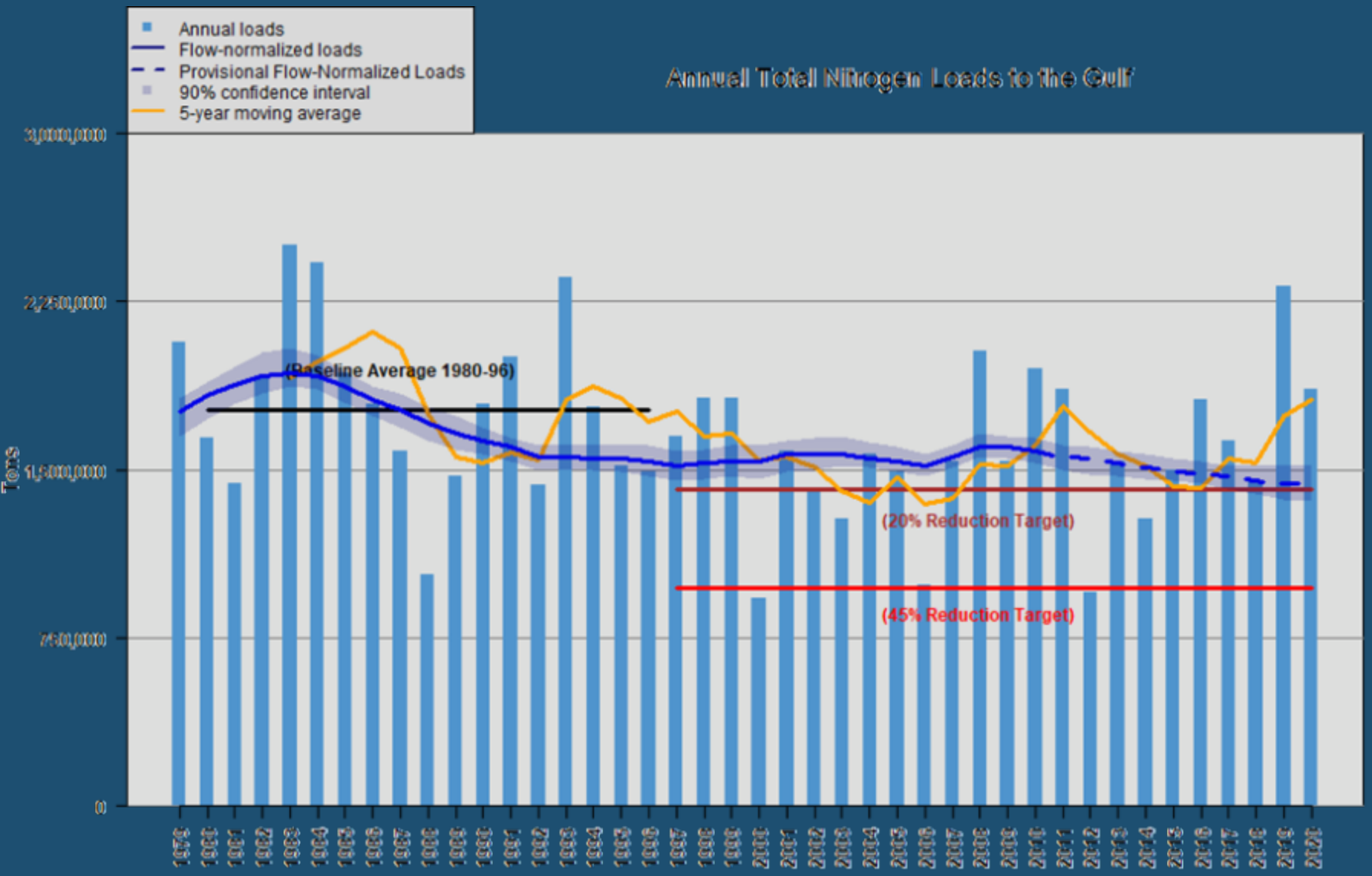


Tools of the Gulf Hypoxia Action Plan

- Conservation Programs in the Farm Bill;
- USDA Landscape Initiatives: MRBI, RCPP
- State Nutrient Reduction Strategies (12 states in Mississippi/Ohio River Basins)
- Water Resources Development Act (WRDA)
- Land and Water Conservation Fund
- Section 319; Clean/Drinking Water State Revolving Funds
- Private efforts: Ducks Unlimited, Nature Conservancy, Conservation Fund, Restore the Earth Foundation, Iowa Soybean Association, Innovative Watershed Projects

Gulf Hypoxia Action Plan – Collateral and Reciprocal Benefits

- Agricultural Productivity and Resilience
- Climate Resilience, GHG Reduction/ Sequestration
- Drinking Water Protection
- Ecosystem Protection and Restoration
- Natural Infrastructure for Flood Risk Reduction
- Harmful Algal Bloom Prevention


Annual loads
Flow-normalized loads
Provisional Flow-Normalized Loads
90% confidence interval
5-year moving average
Annual Total Nitrogen Loads to the Gulf
3,000,000
2,250,000
1,500,000
750,000
0
Tons
(Baseline Average 1980-96)
(20% Reduction Target)
(45% Reduction Target)
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021

Gulf Hypoxia Action Plan Funding

- 2001 – Draft federal budget for Plan – never applied
- Conservation Programs in US Farm Bill remain key tool for GHAP since it was signed
- 2010 – USDA NRCS creates Mississippi River Basin Initiative, combining and focusing several Farm Bill Programs in watersheds that drain (ultimately) to the Gulf from Mississippi/Ohio River Basin
- 2022 – Bipartisan Infrastructure Law/Infrastructure, Investment, & Jobs Act – Cassidy provision directing $60 million over 5 years to GHAP – the first direct Congressional funding for HTF States/GHAP since Plan signed
- 2022 – EPA creates **Gulf Hypoxia Program** to BIL funds to HTF States, Tribes, Land Grant Universities – funds last throughFY26
- Inflation Reduction Act 2022 – several billion in "climate smart" conservation practices (same as water quality improvement practices)

- .

Inflation Reduction Act 2022

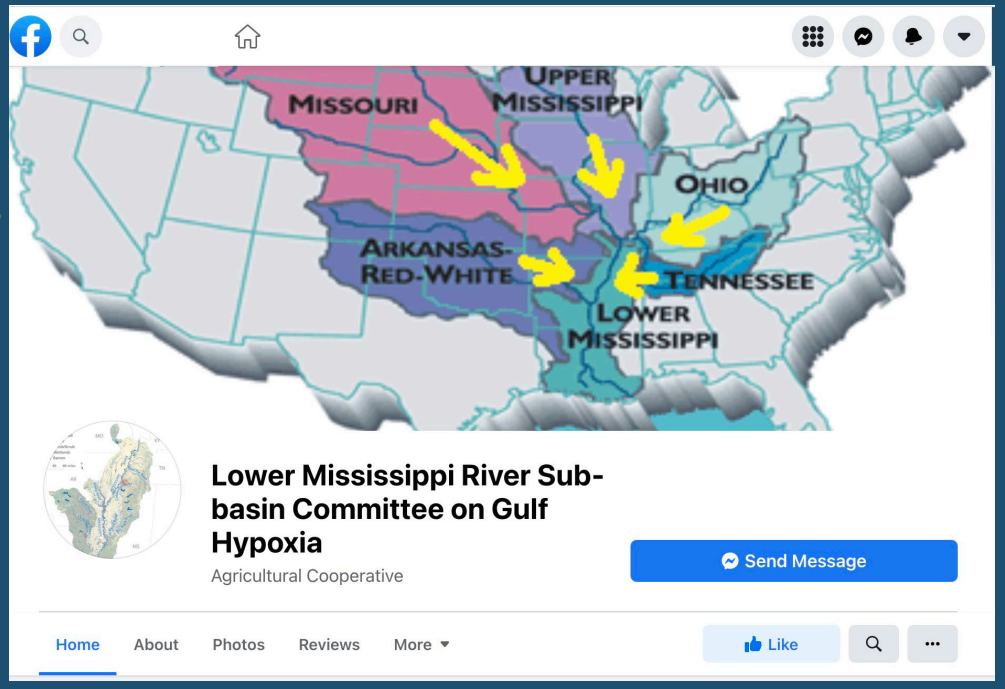
- $8.45 billion for the **Environmental Quality Incentives Program** (EQIP) - financial support to implement conservation practices on working lands.
- $6.75 billion for the **Regional Conservation Partnership Program** (RCPP) - grants for conservation projects at the state, multistate, or watershed-scale level.
- $3.25 billion for the **Conservation Stewardship Program** (CSP) - financial assistance to producers to maintain and improve existing conservation systems and to adopt additional conservation activities.
- $1.4 billion for the **Agricultural Conservation Easement Program** (ACEP), financial support for Agricultural Land Easements and Wetland Reserve Easements.

Looking Forward – Current Situation 2025

- Uncertainty of USDA conservation funding in Inflation Reduction Act
- Uncertainty of current USDA conservation funding, prospect for renewed Farm Bill
- Dismantling of federal agencies, programs, research
- Key Hypoxia Action Plan Funding Prospects: EPA Gulf Hypoxia Program (HTF States), Upper and Lower Mississippi River Restoration Programs/Studies, Farm Bill

Thank you

Doug Daigle
Coordinator
Louisiana Hypoxia Working Group
Room 1197, Energy, Coast, Environment
Louisiana State University
Baton Rouge, LA 70803
lahwgroup@gmail.com



"Like" us on Facebook