



One Community Around The Lake

Lake Stevens Lake Management Program Overview

SHANNON FARRANT AND SETH WALTZ

FEBRUARY 24, 2026



Overview

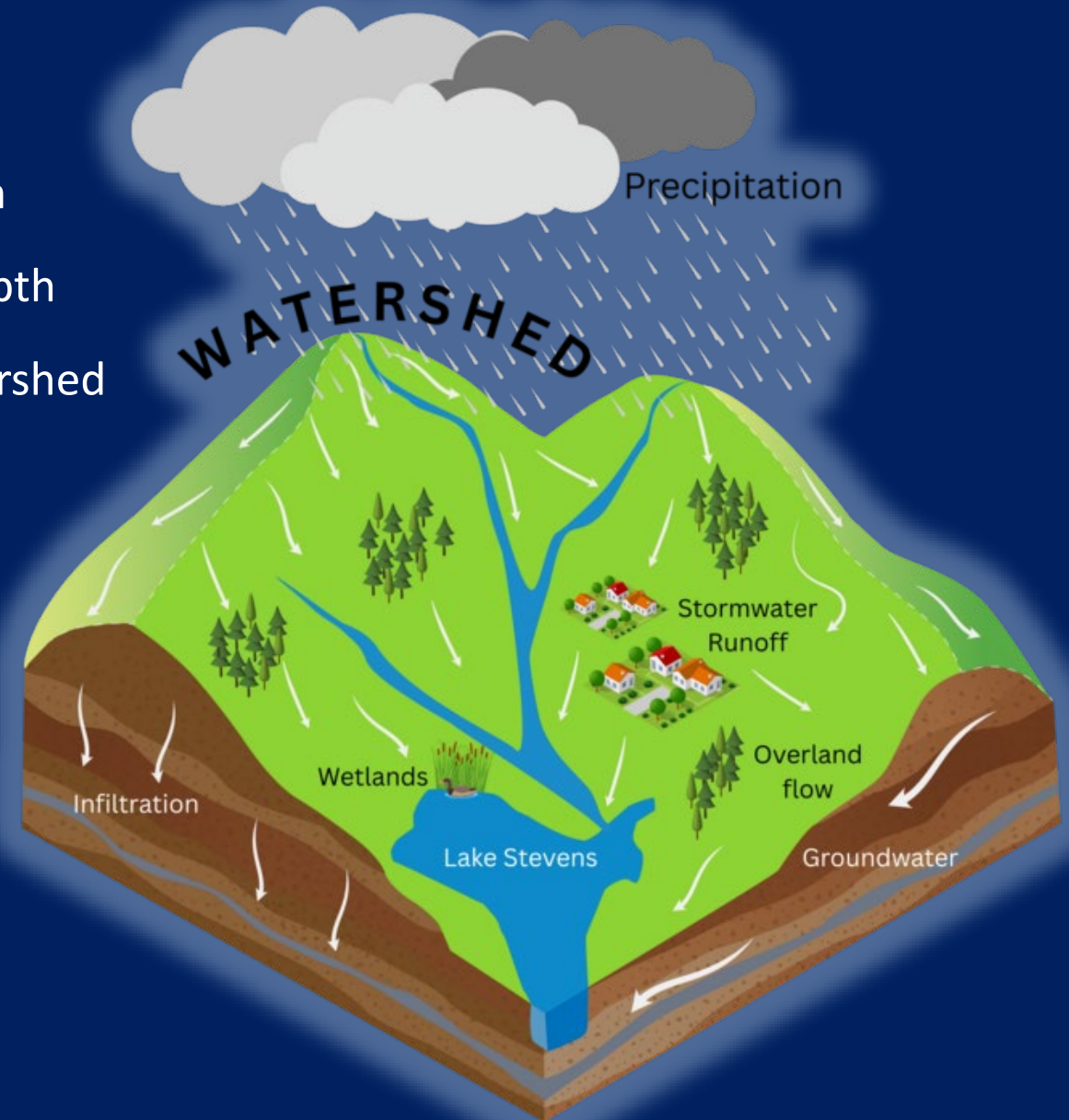
- Lake Stevens History
- Water Quality Overview
- Lake Management Strategies
- Current Lake Management Program
- 2025 Water Quality Results
- 2026 Lake Management Strategy
- 2024 and 2025 Perchlorate Results
- Other Lake Management Programs
- Community Engagement

"A lake is a mirror of its watershed — what happens on the land is reflected in its waters."



Lake Stevens

- 1,013 acres
- 150 ft Max Depth
- 63 ft Average Depth
- 3,500 acres watershed



History of Lake Stevens

Rucker Mill before 1916



Lake Stevens 1940

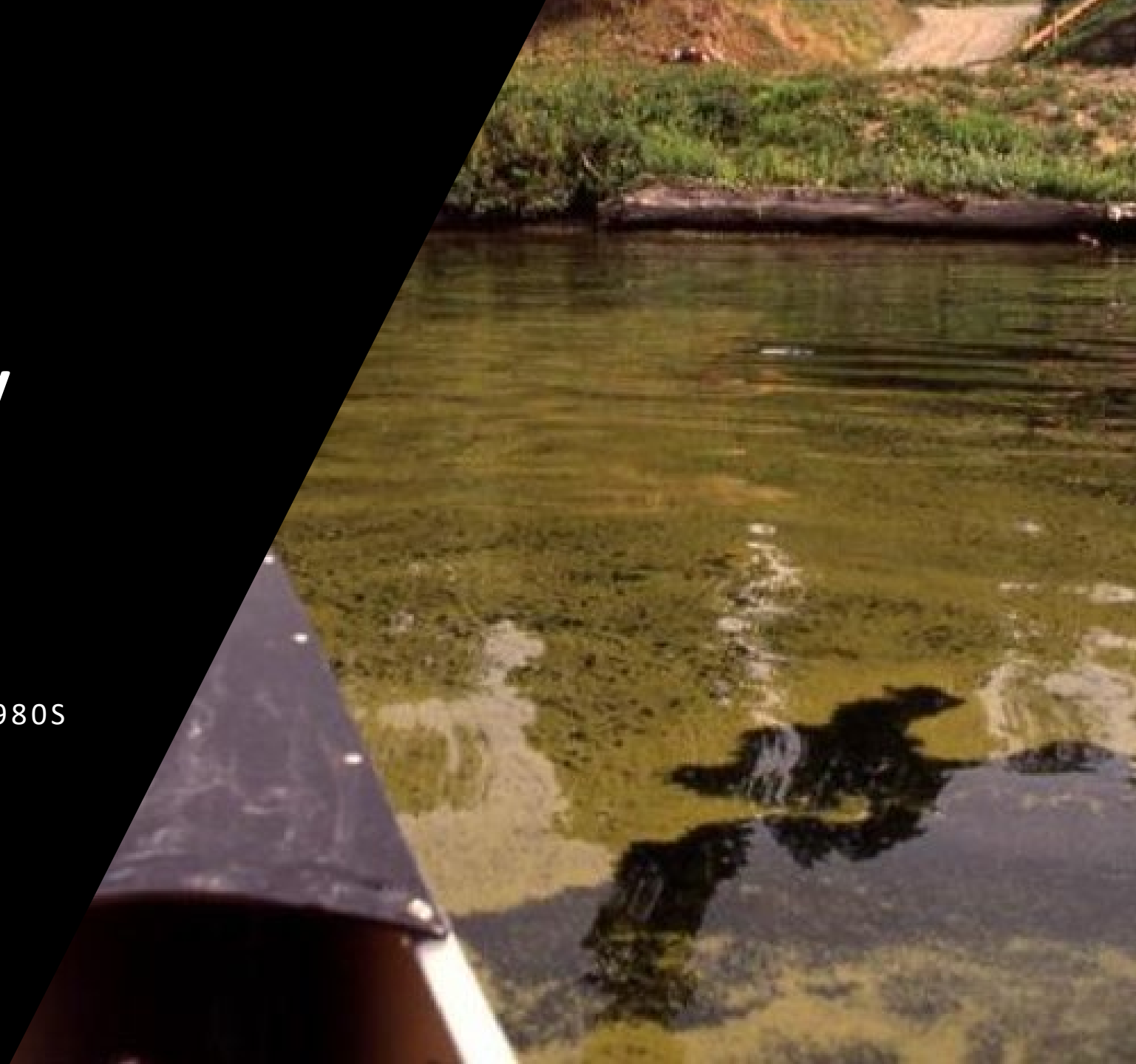


Rucker Mill 1917



Water Quality 1970s and 1980s

RESTORATION STUDIES BEGAN IN 1980S



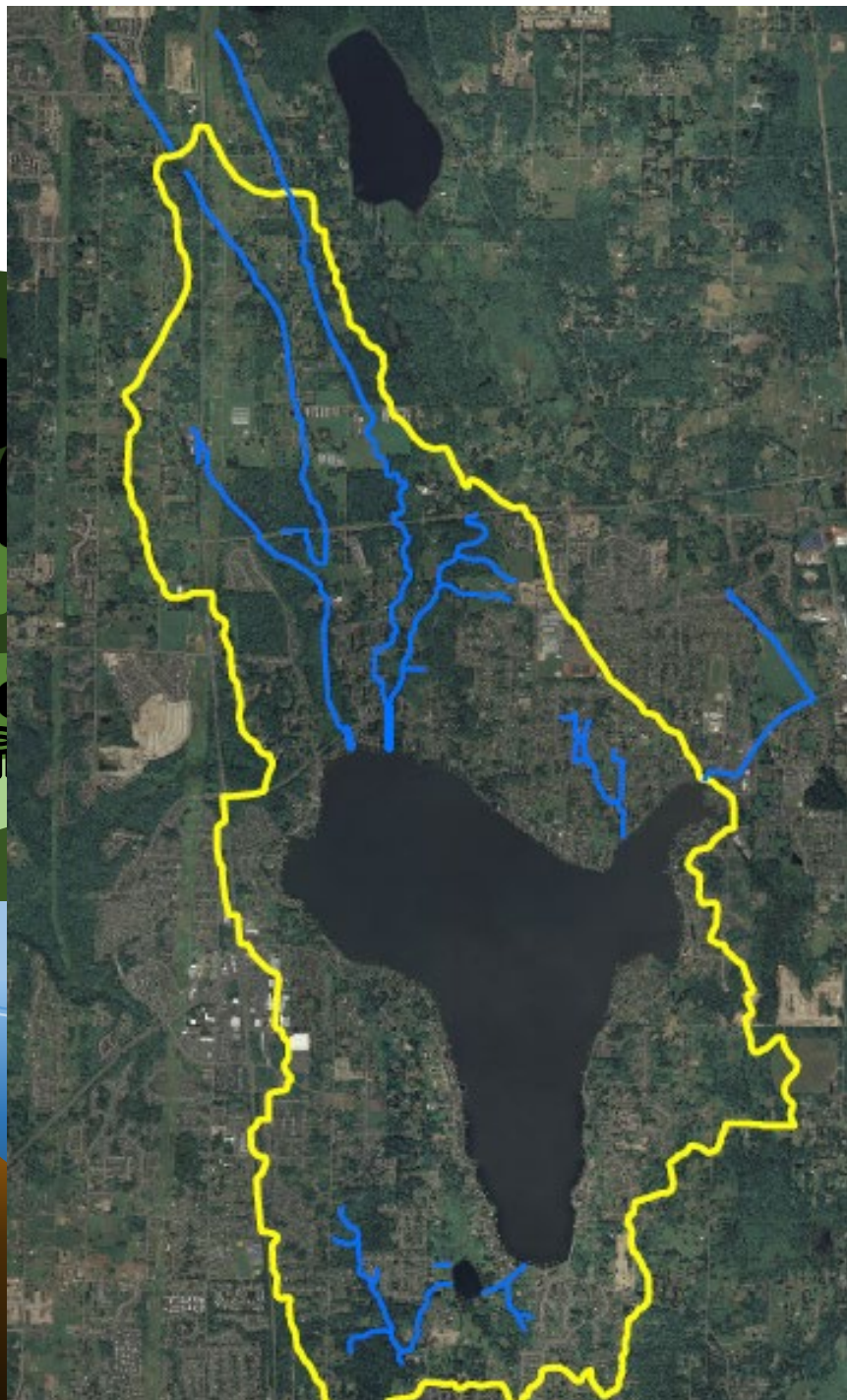
What Causes Algae Blooms?

- **Phosphorus** is key nutrient
- A little goes a long way
- 1 tsp = 30 lbs of algae
- BUT where does it come from??



Phosphorus comes from around the lake –
a.k.a the “watershed”

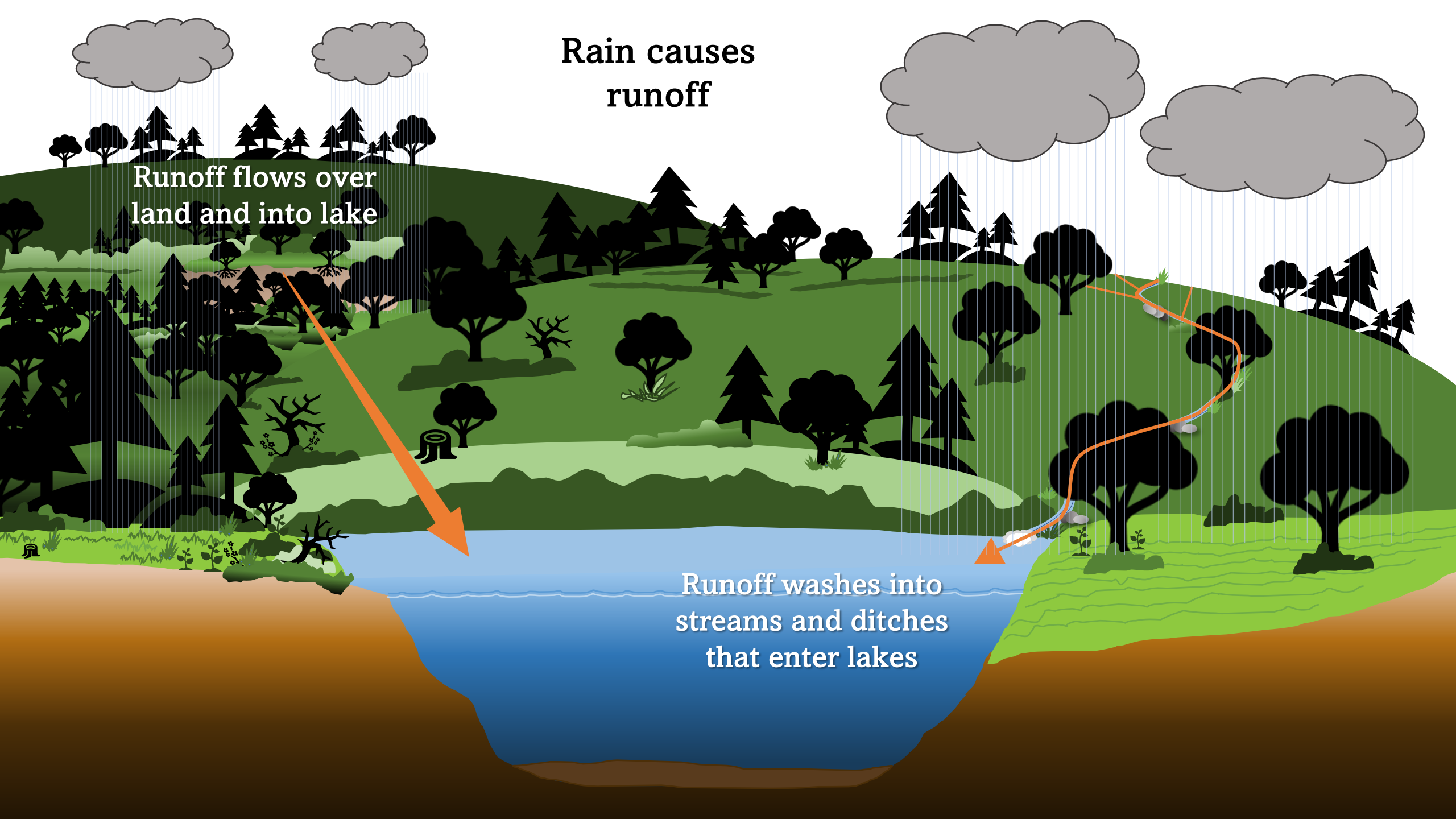




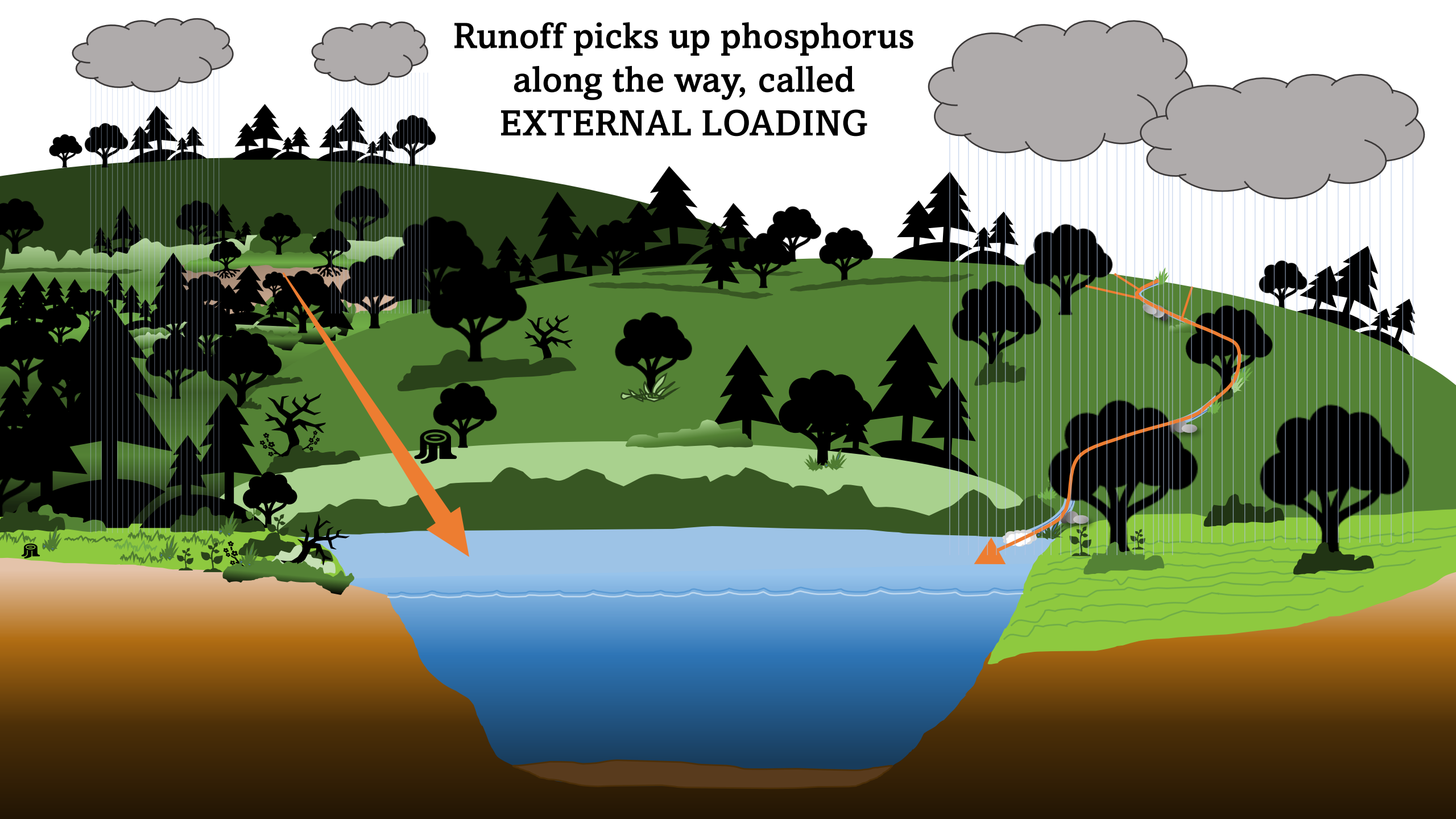
Rain causes runoff

Runoff flows over land and into lake

Runoff washes into streams and ditches that enter lakes



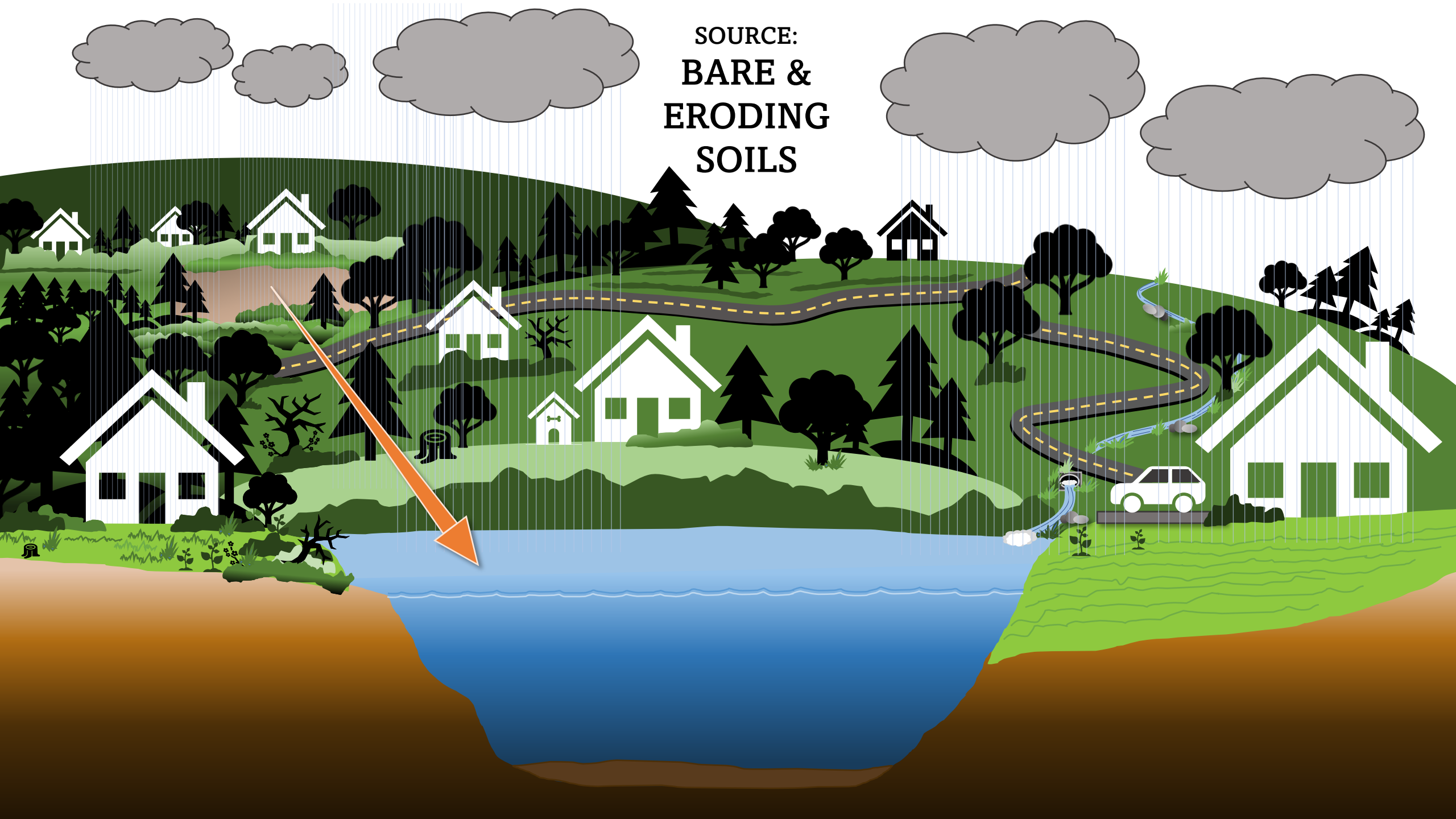
Runoff picks up phosphorus
along the way, called
EXTERNAL LOADING



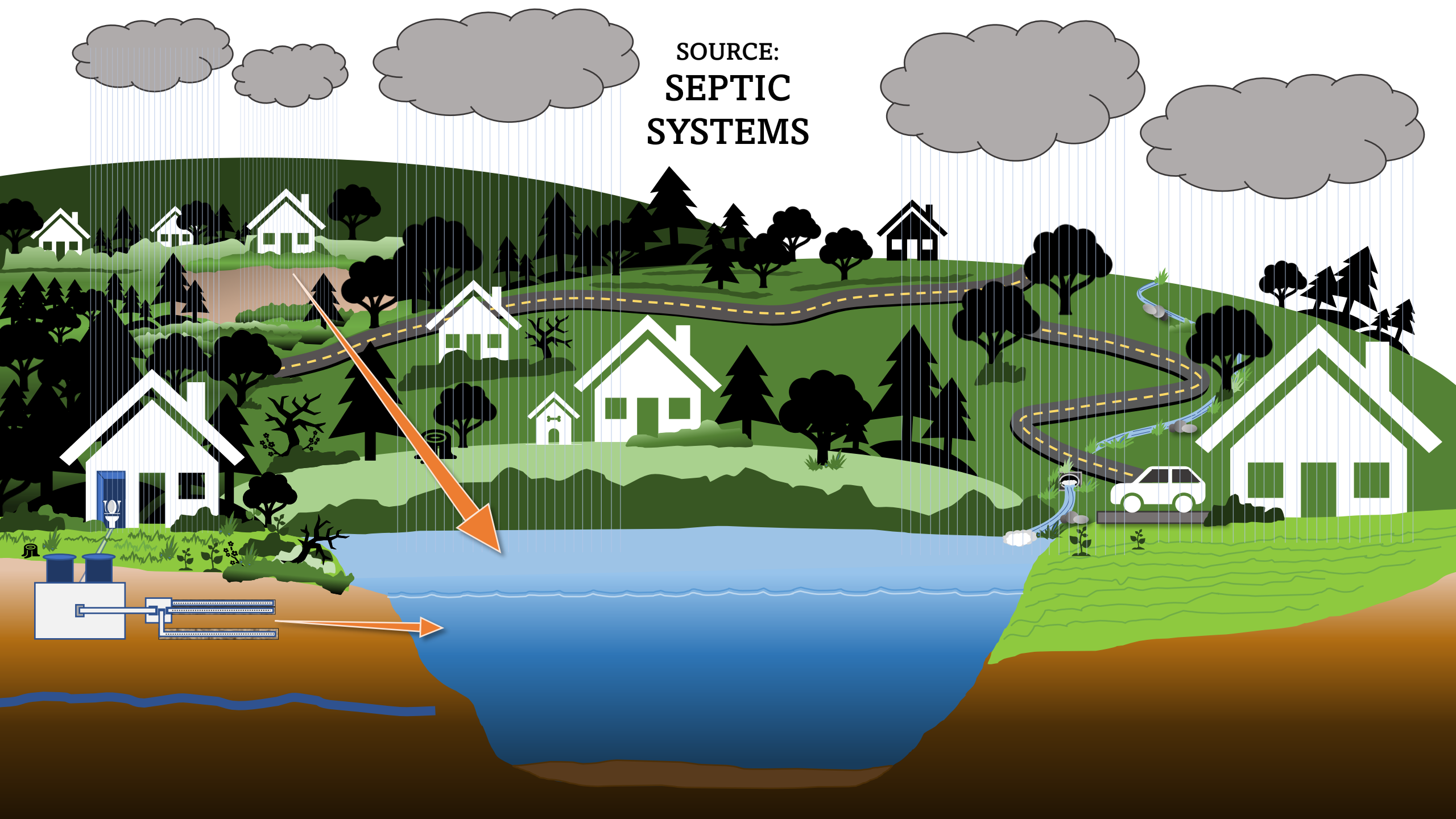
People bring additional phosphorus sources



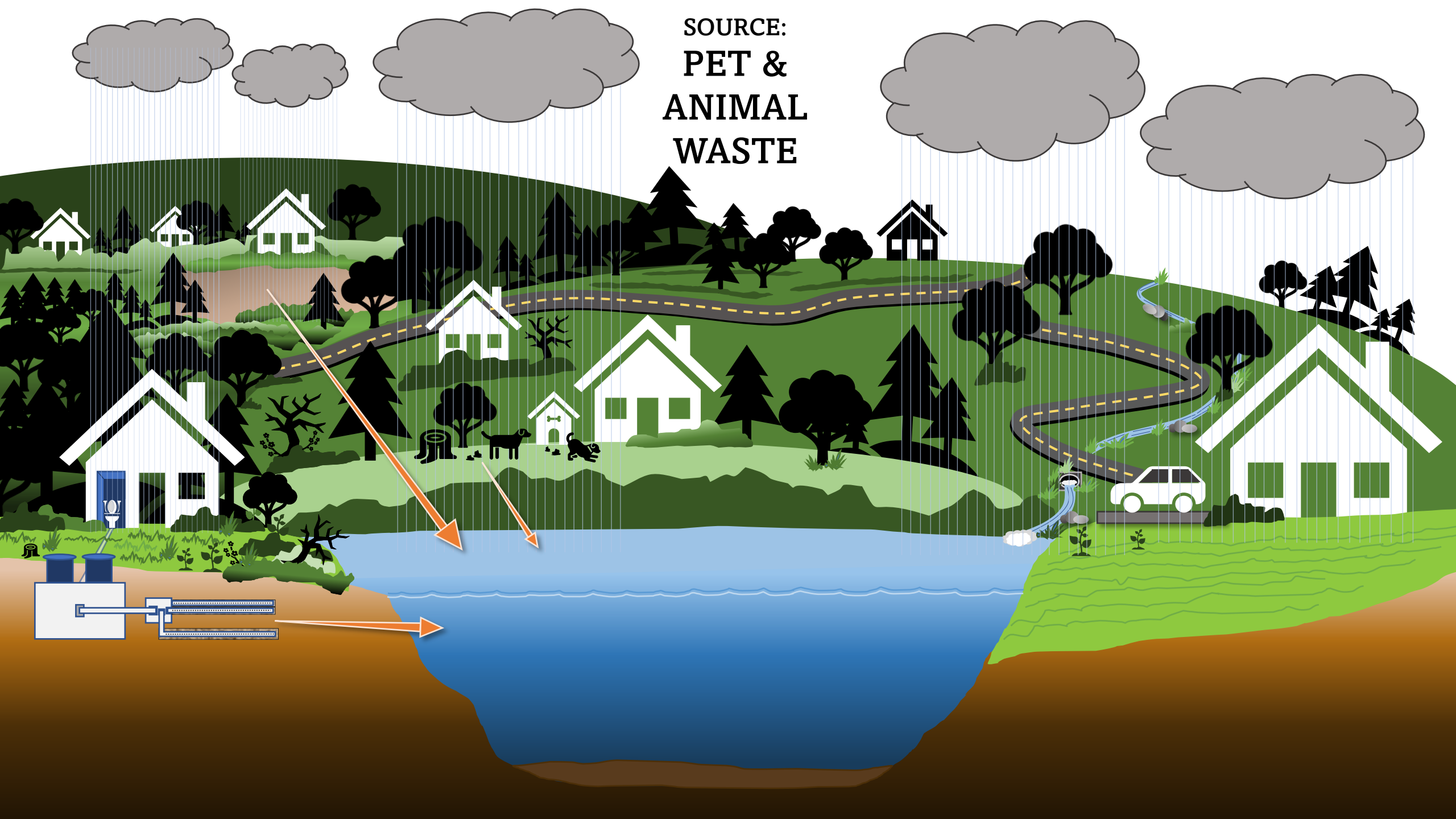
SOURCE:
BARE &
ERODING
SOILS



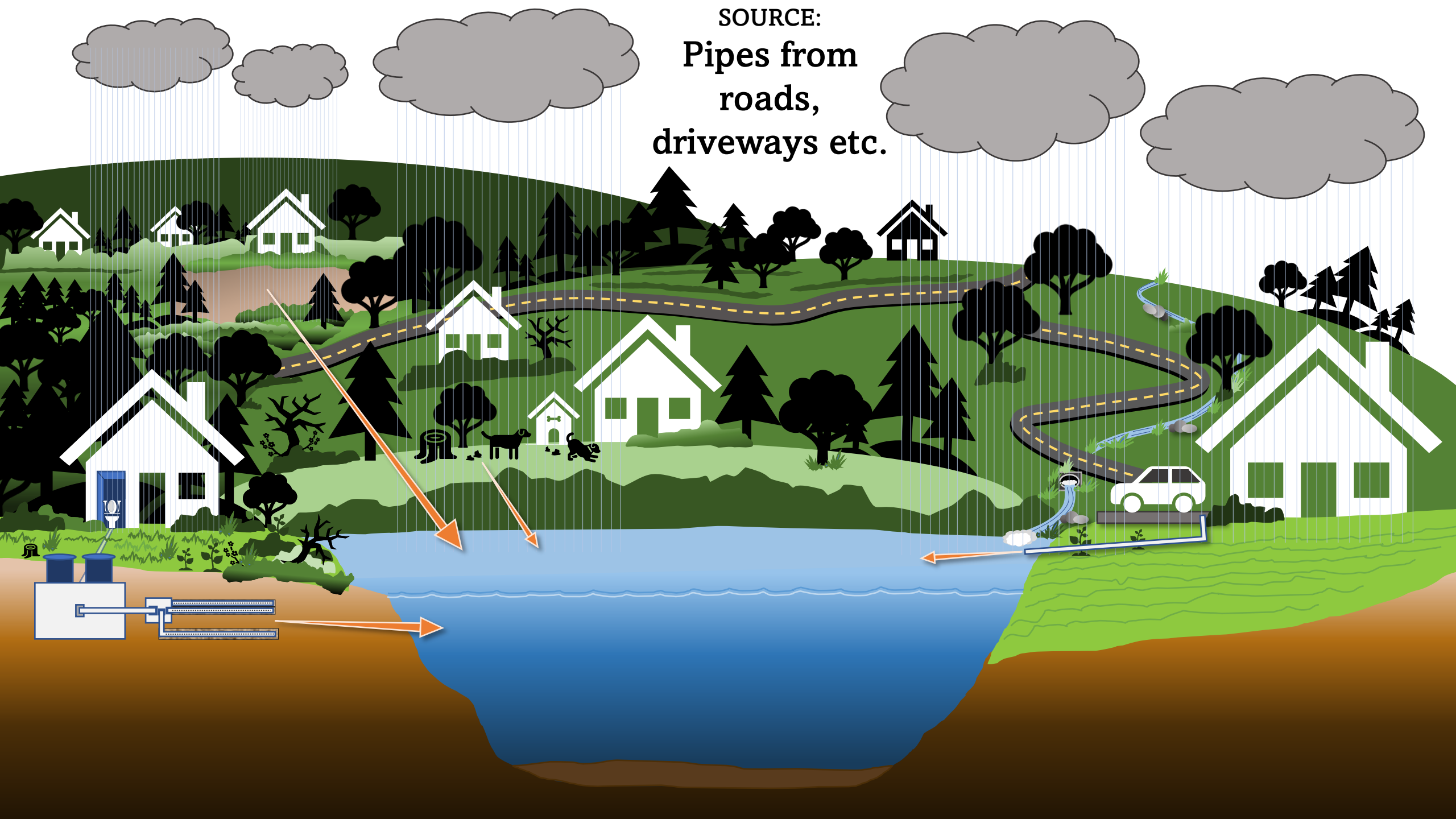
SOURCE:
SEPTIC
SYSTEMS



SOURCE:
PET &
ANIMAL
WASTE



SOURCE:
Pipes from
roads,
driveways etc.



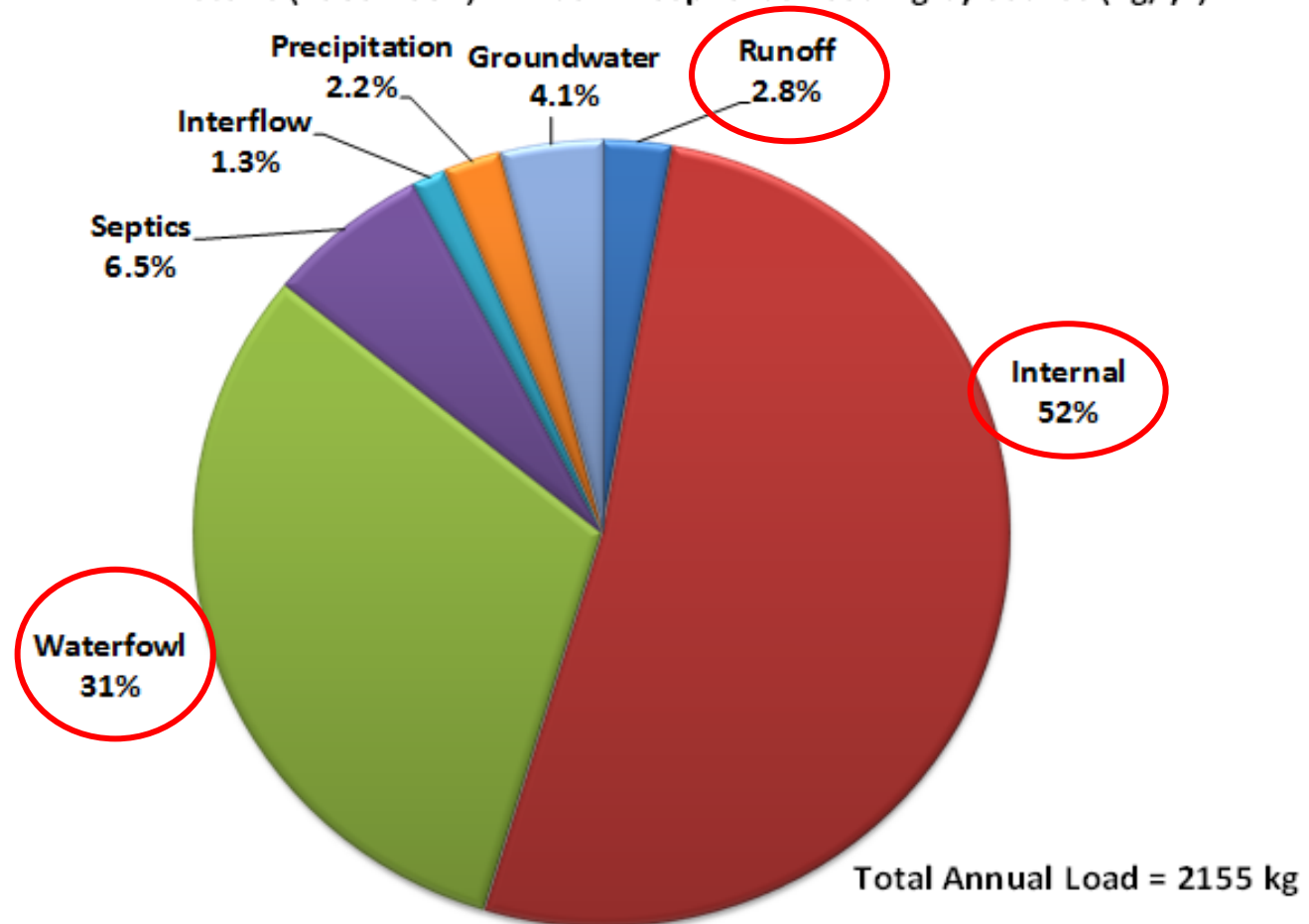
All that Phosphorus builds up at the lake bottom which can recycle back into the water which is called - INTERNAL LOADING

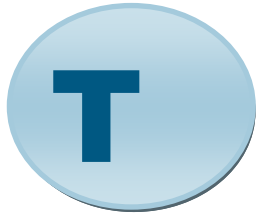


Historic Sources of Phosphorus (1986-1987)

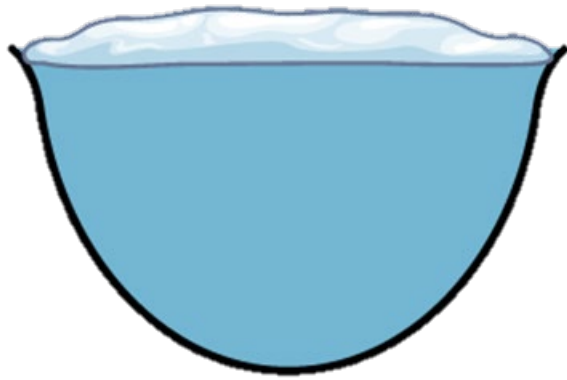
Internal loading mainly occurs when oxygen is low

Historic (1986-1987) Annual Phosphorus Loading by Source (kg/yr)

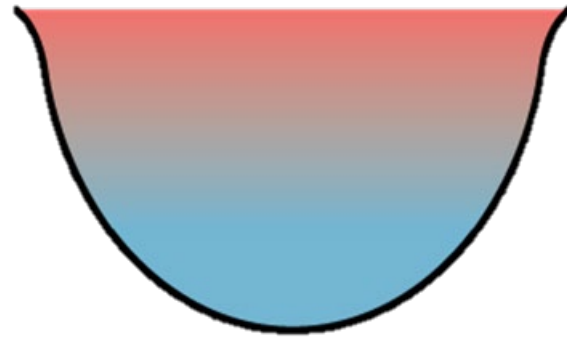




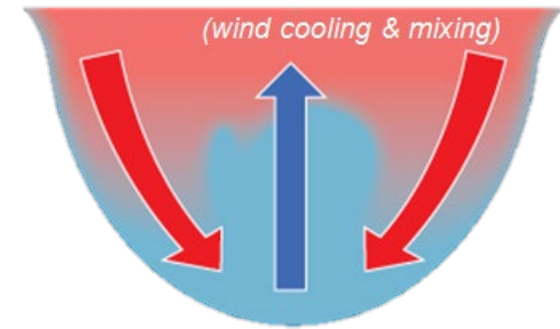
Seasonal Cycle of Lakes - Temperature



Winter



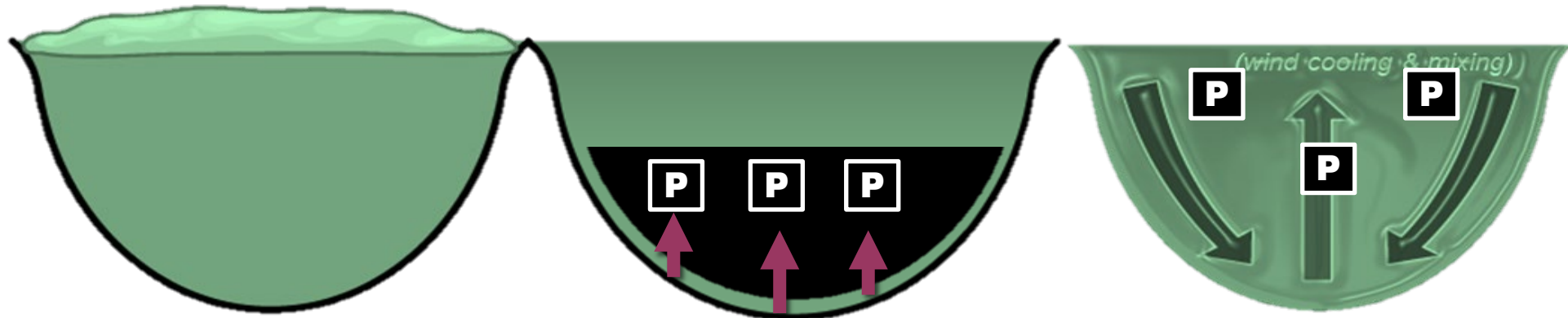
Summer



Fall Turnover



Dissolved Oxygen



Winter

Summer

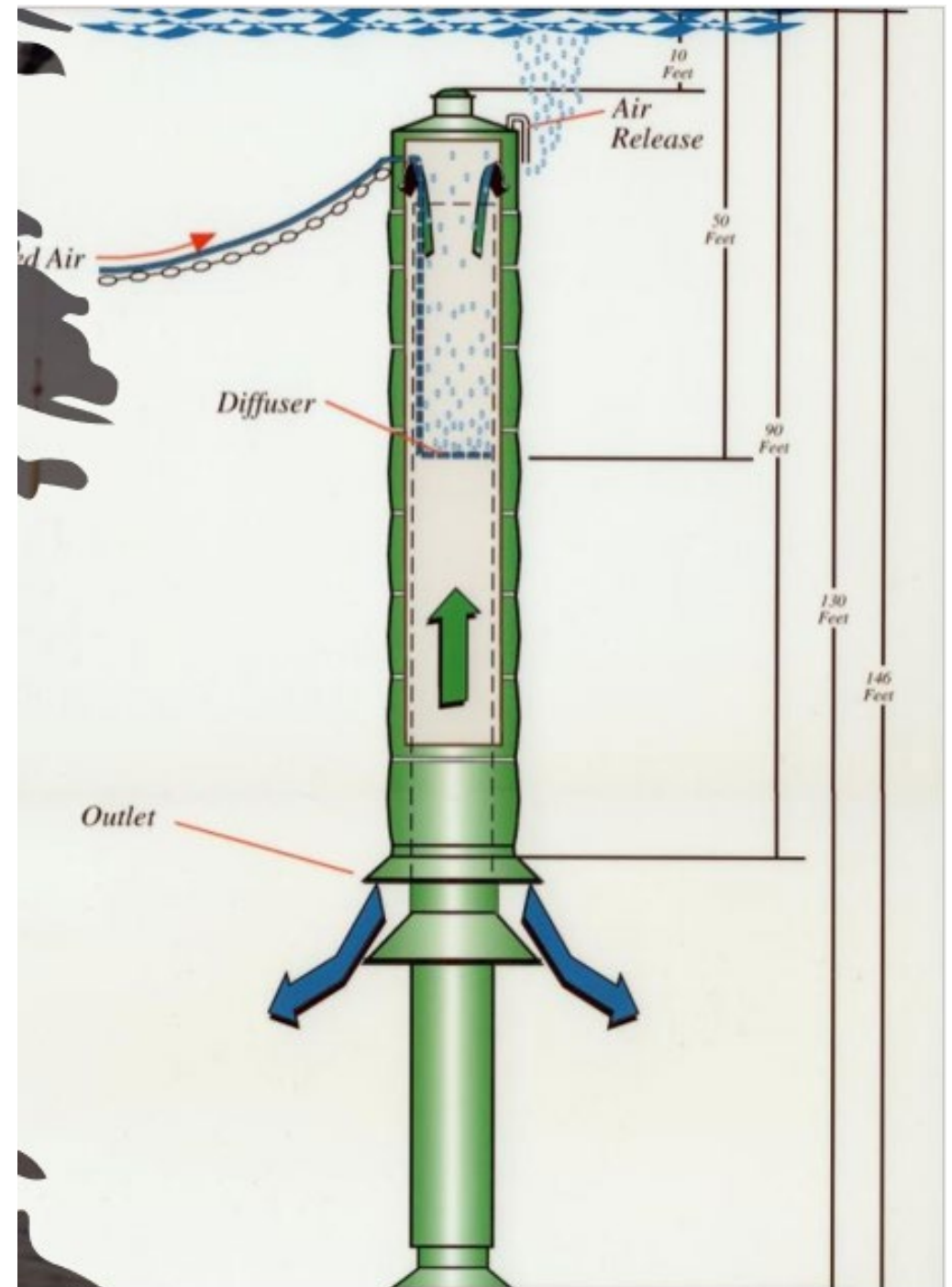
Fall

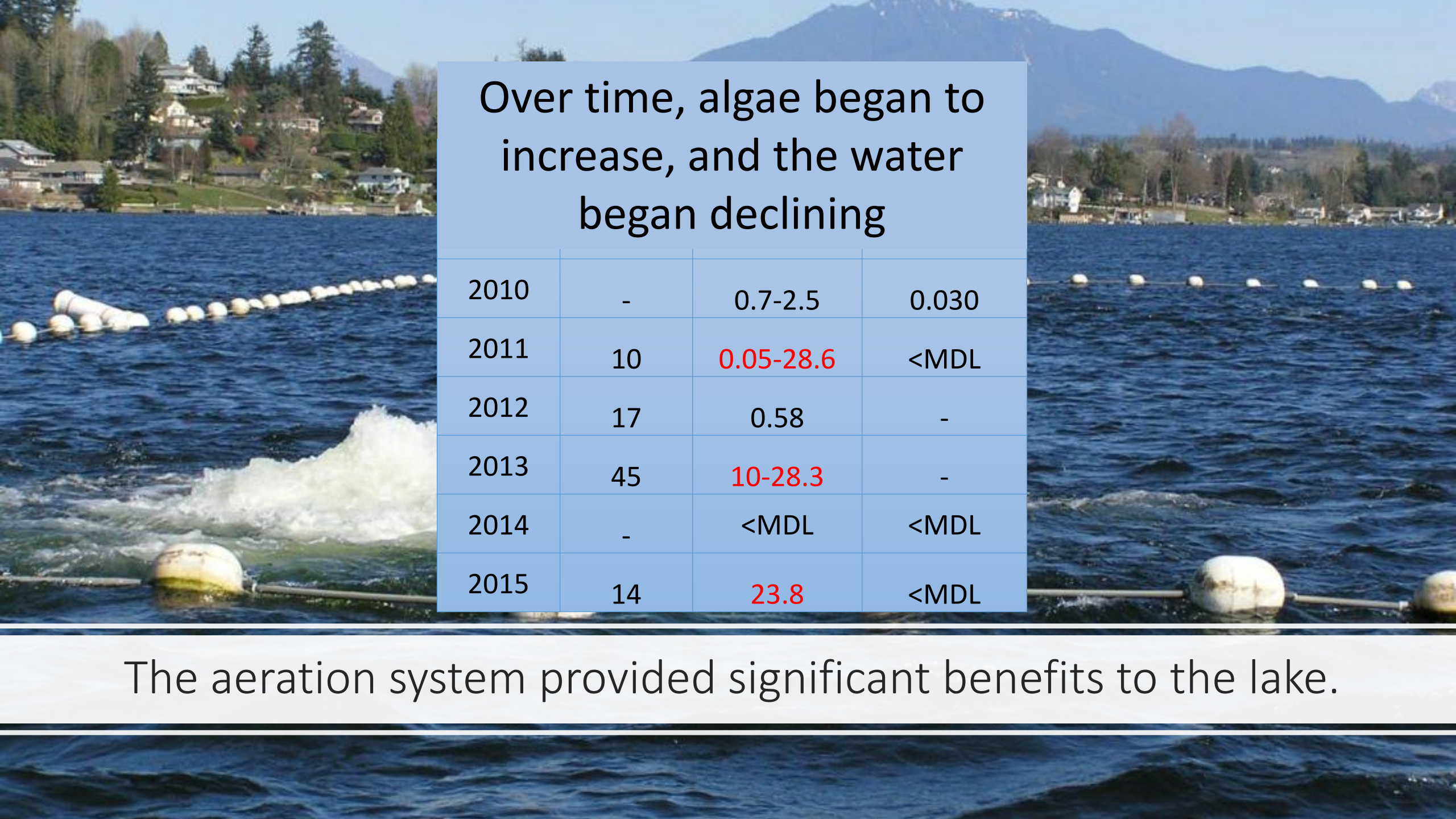
Phosphorus **bound to iron** in lake sediments **is released** when **no oxygen**

When the lake mixes it is spread throughout the lake

Lake Management Strategy #1 Aerator

- In 1994, a \$1.1 million hypolimnetic aeration system was installed
- The four aerators pull low-oxygen water from the lake bottom, mix it with air, and send the high-oxygen water back to the bottom.
- In the presence of oxygen, iron in the sediments stays bound and holds phosphorus
- Operational 1994- 2012





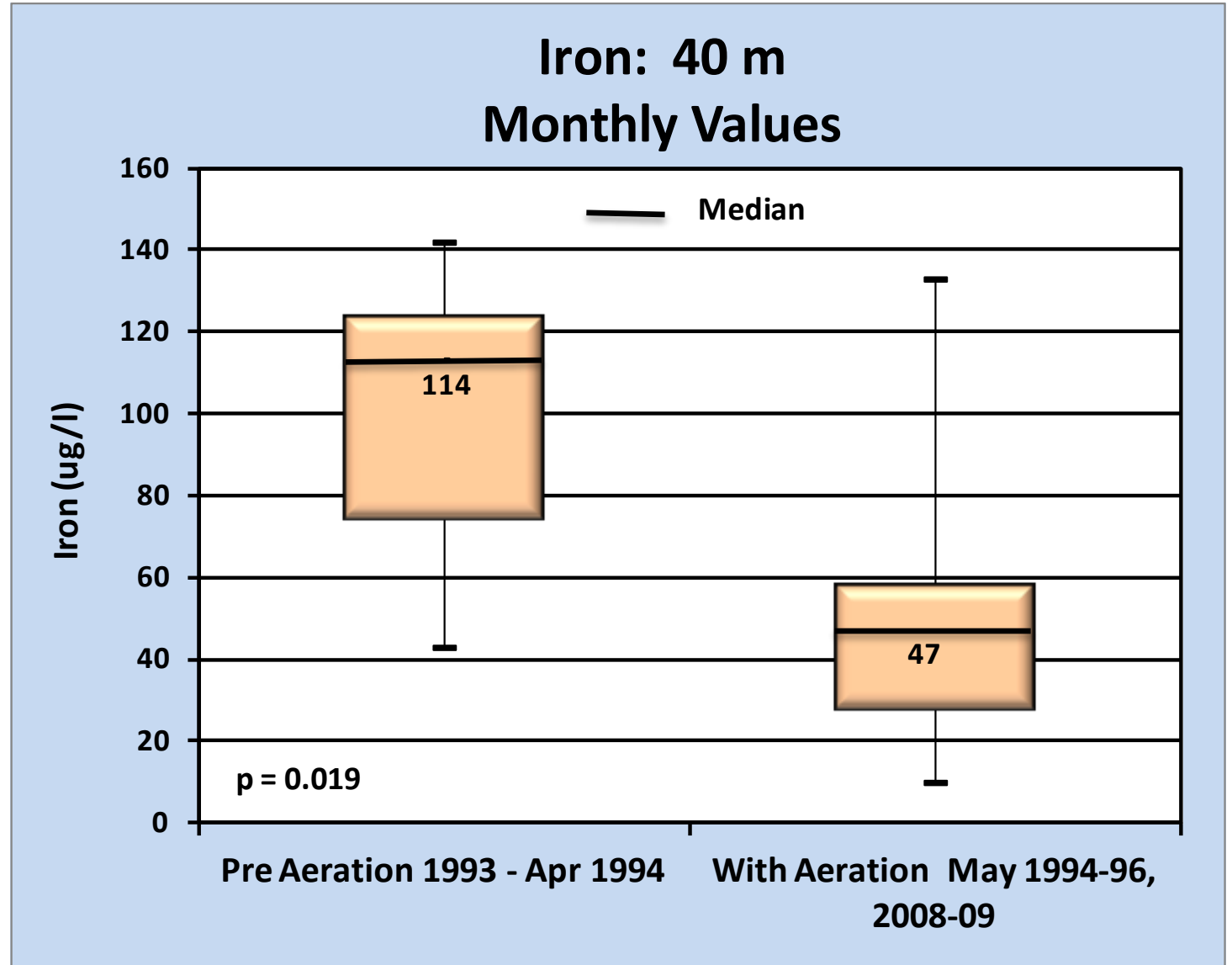
Over time, algae began to increase, and the water began declining

2010	-	0.7-2.5	0.030
2011	10	0.05-28.6	<MDL
2012	17	0.58	-
2013	45	10-28.3	-
2014	-	<MDL	<MDL
2015	14	23.8	<MDL

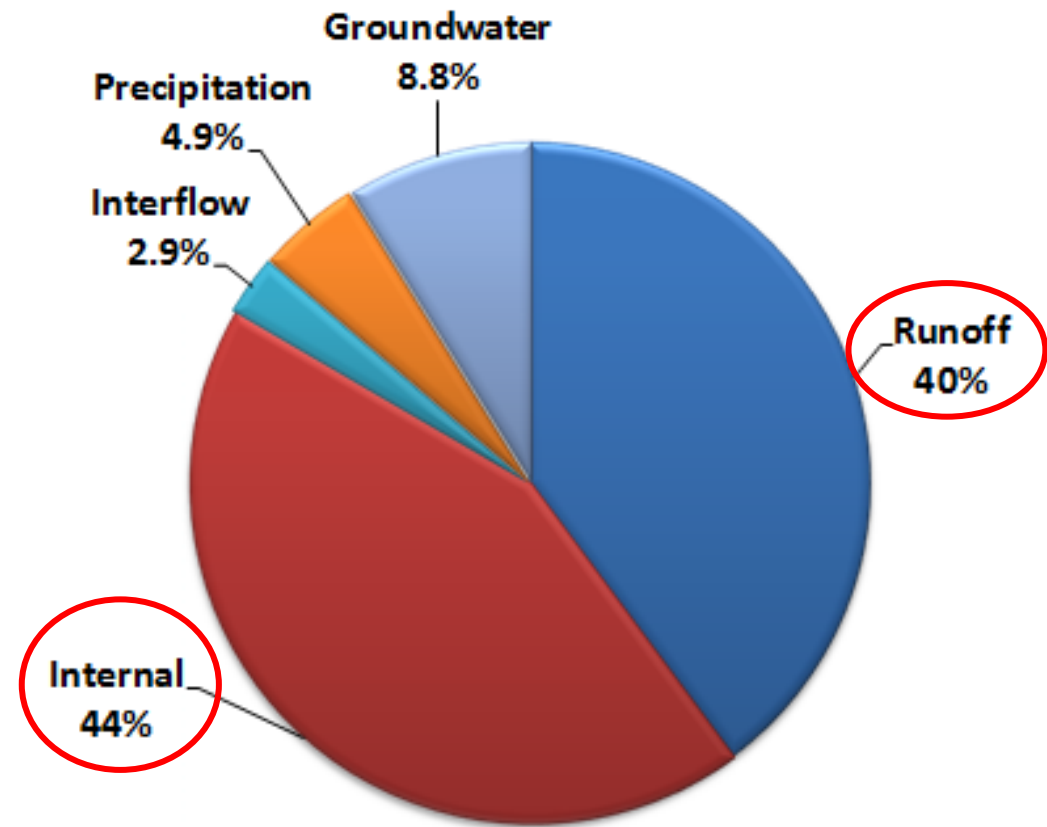
The aeration system provided significant benefits to the lake.

Why did it stop working?

- 2009 sediment study completed
- Finding - Depletion of iron needed to bind all the phosphorus

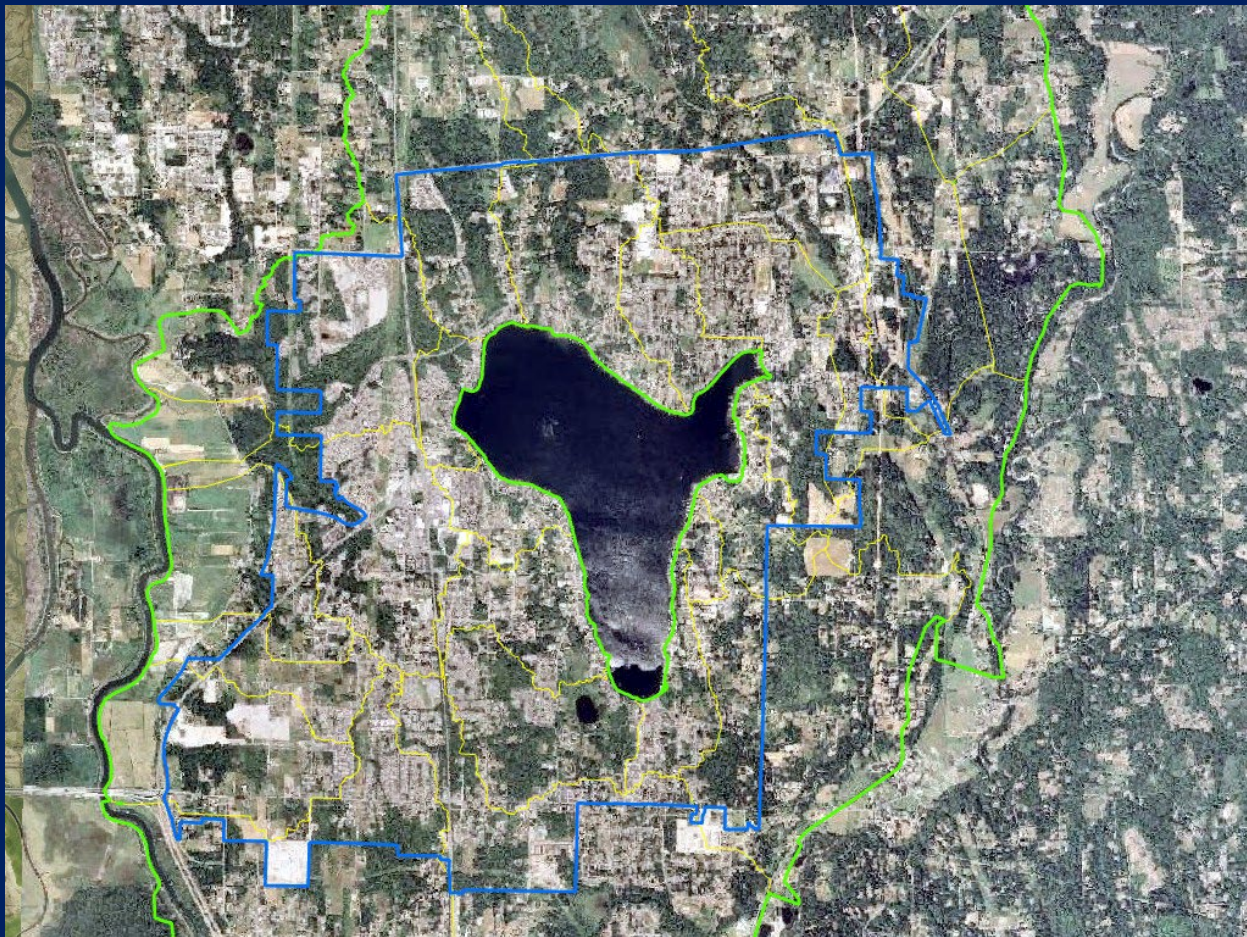


2011 Study

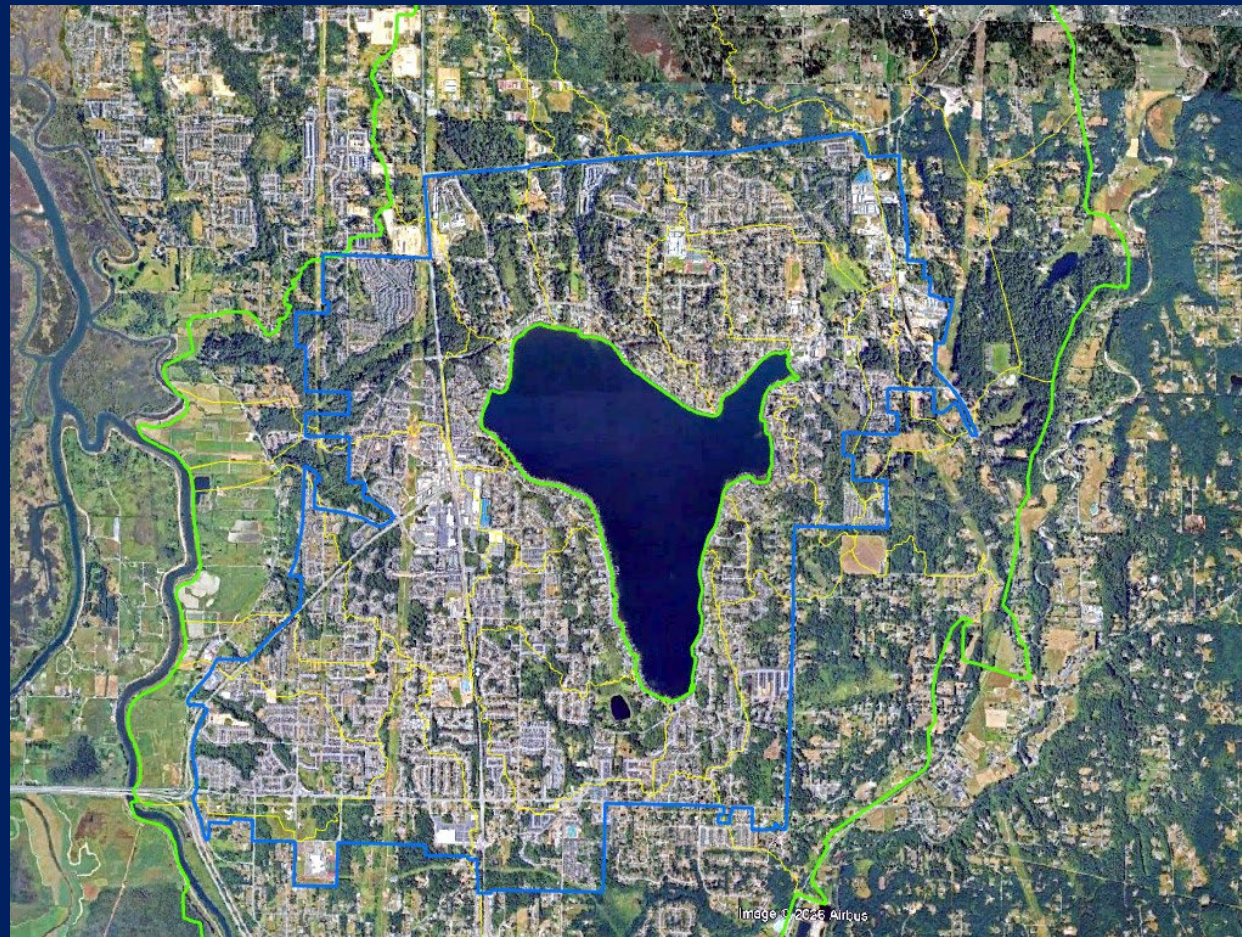


Total Annual Load = 992 kg

Changing Landscape



2006



2025

Lake Management Strategy #2: Alum

- 2013 - PRESENT
- ALUM AND P BONDS WITH LOW O₂
- MOST COMMON LAKE RESTORATION METHOD USED TODAY
- SAFE AS USED IN DRINKING WATER TREATMENT, PICKLING (YOU CAN BUY IN A STORE)



Current Lake Management Program

WATER QUALITY MONITORING



Sonde Reading



Biological Sampling

[Lake Management | Lake Stevens, WA - Official Website](#)

ALGAE AND AQUATIC PLANT MANAGEMENT

Eurasian Water Milfoil



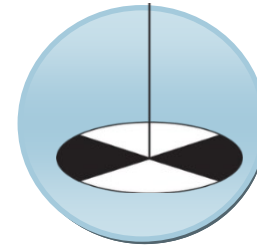
*American
Pondweed*



Algae identification



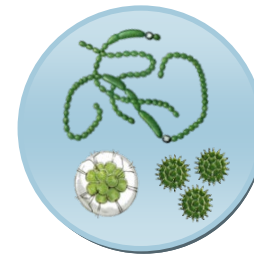
How do we assess lake health?



WATER CLARITY



PHOSPHORUS



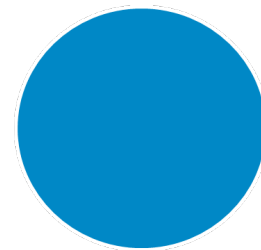
ALGAE



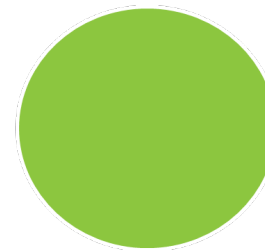
SHORELINE



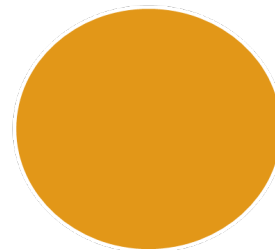
How do we rate
health?



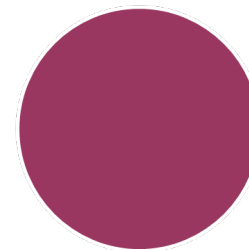
EXCELLENT



GOOD



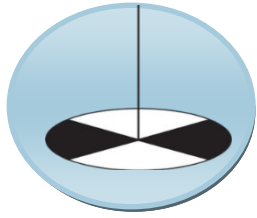
FAIR



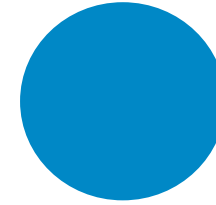
POOR



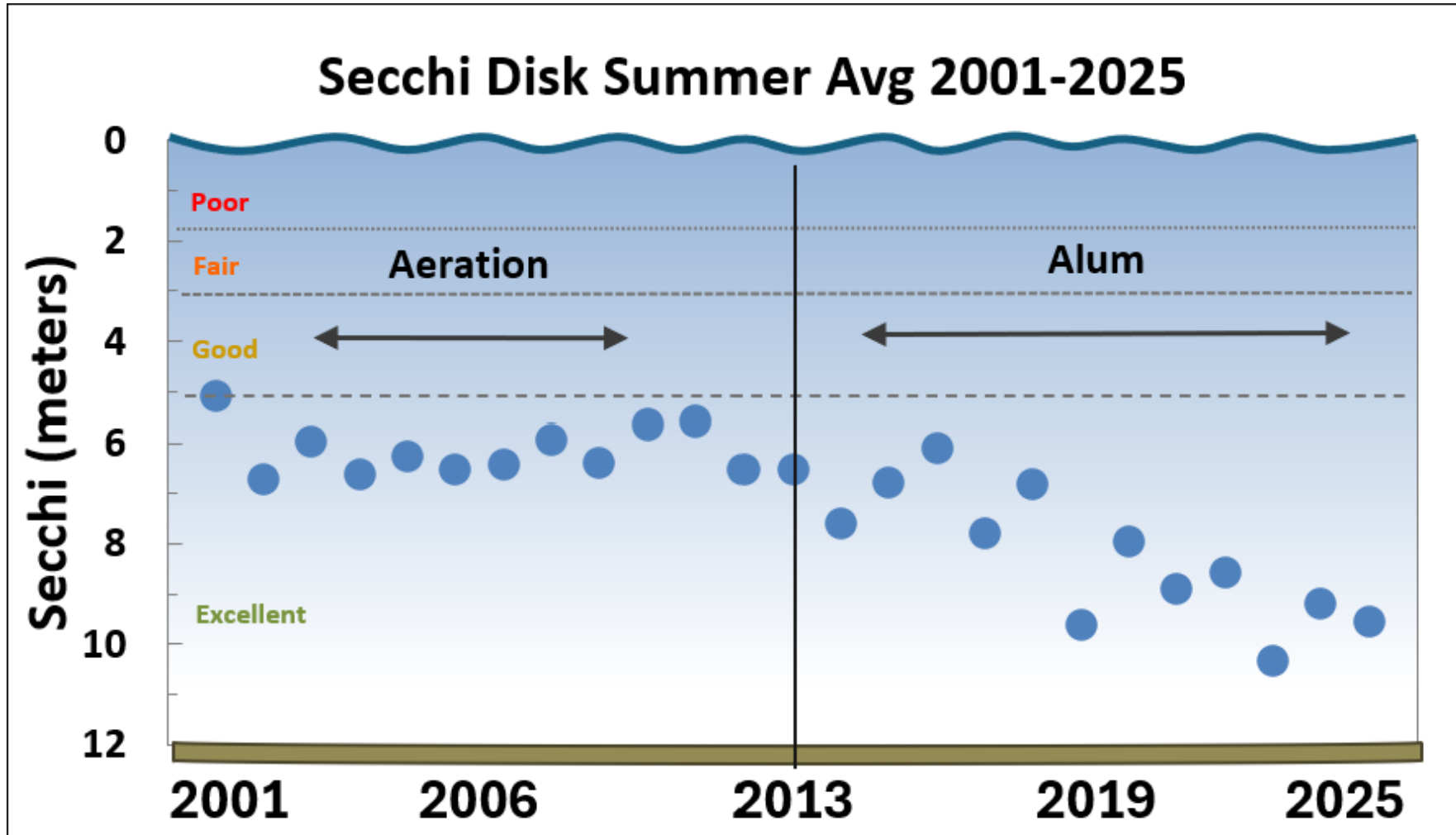
● Excellent Health . . with a lot of work



Water Clarity

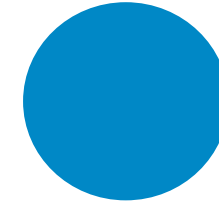


EXCELLENT

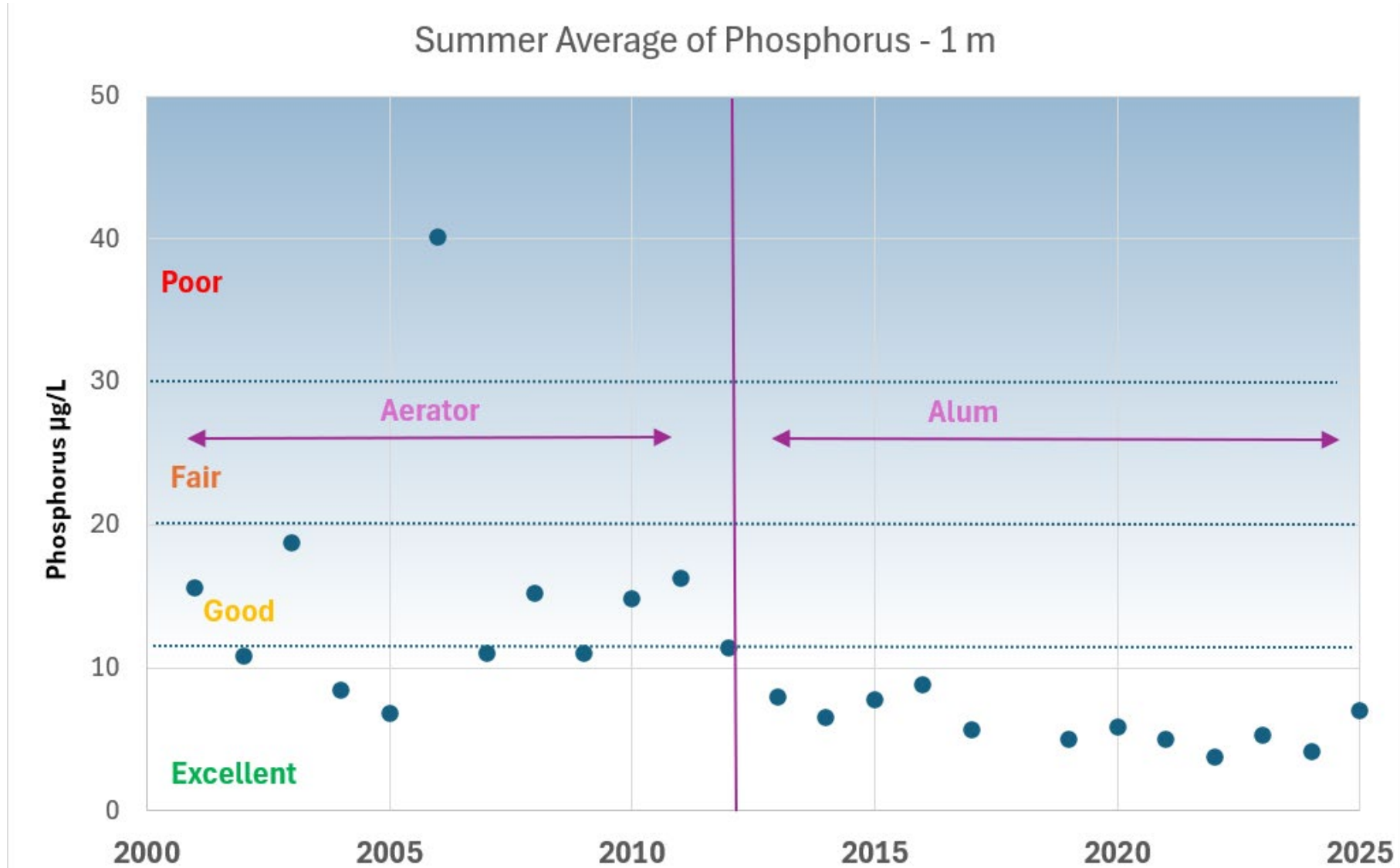




Phosphorus

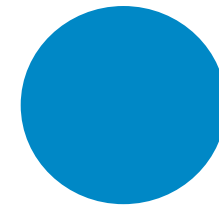


EXCELLENT

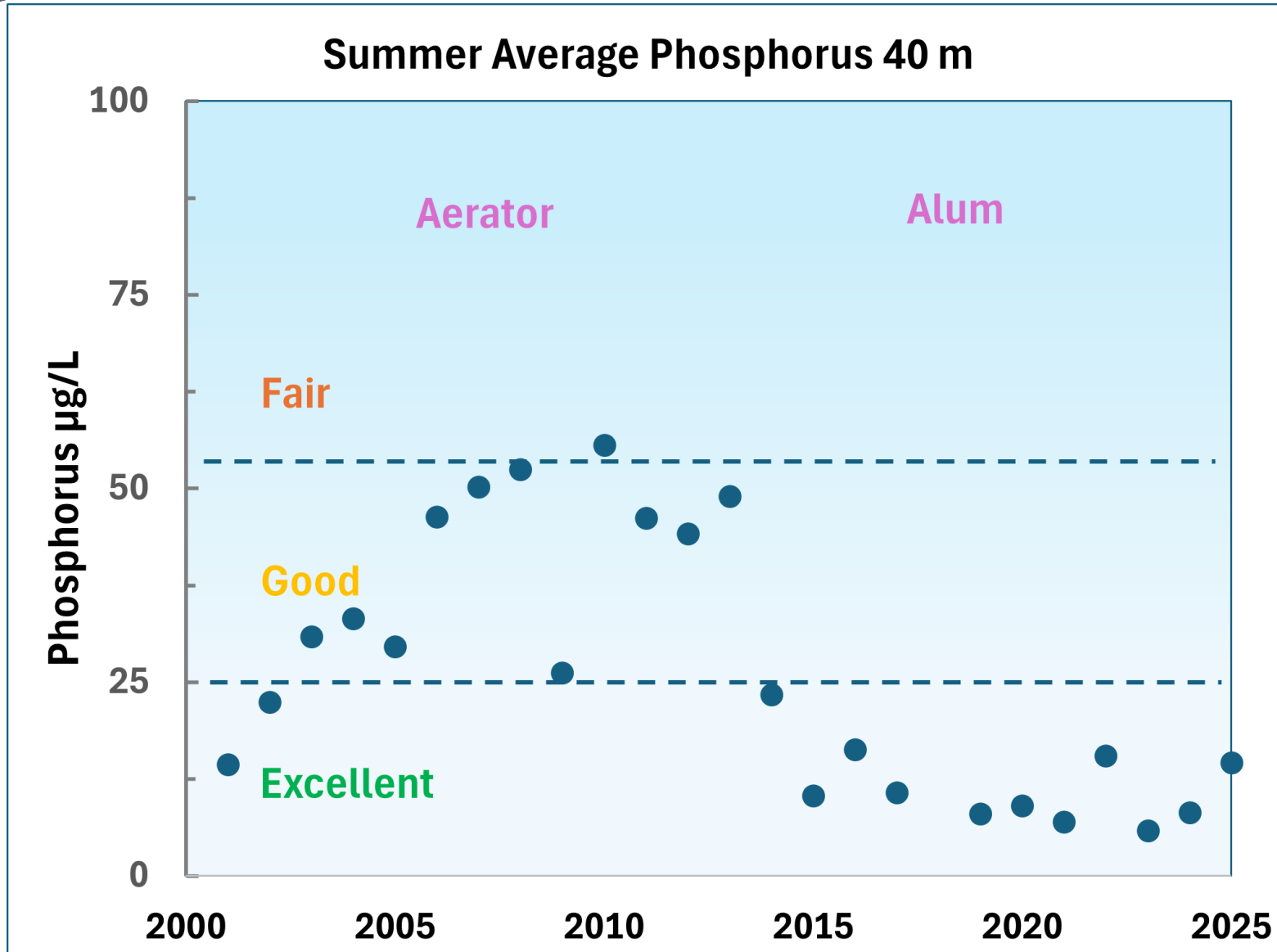




Phosphorus

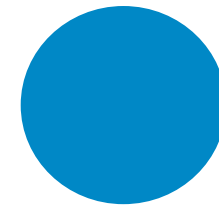


EXCELLENT

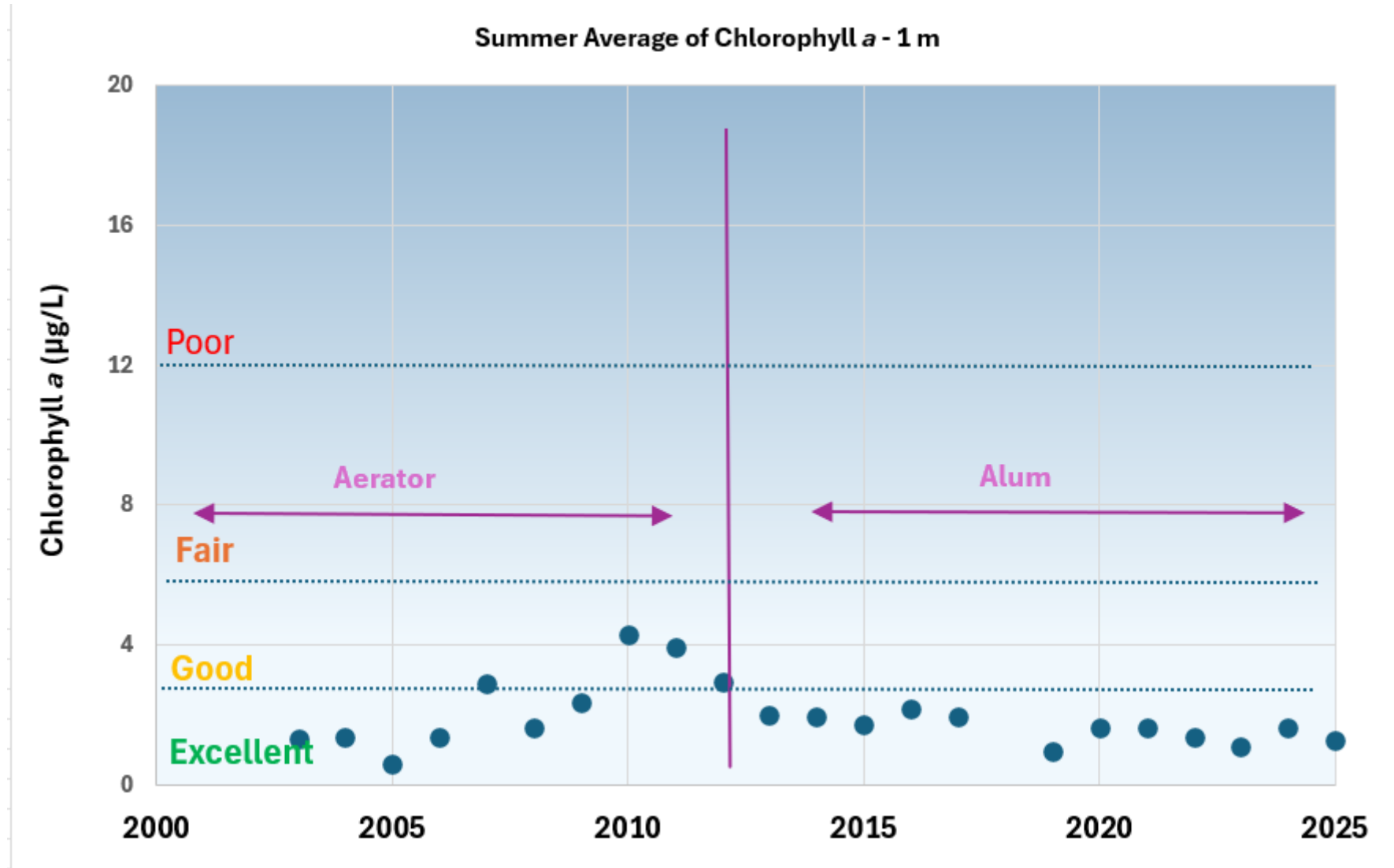




Chlorophyll a



EXCELLENT



Recent Algae Blooms

Last Alum Treatment - 2022



Toxic algae blooms happen in this lake

Avoid areas of scum



Toxic algae, also called cyanobacteria, can make you and your pets very sick. Algae blooms can look like scum, streaks or clumps in the water.

У цьому озері зустрічаються токсичні водорості. Уникайте поверхневостей, покритих водоростями.

En este lago hay algas tóxicas. Evitar las zonas con verdín.

此湖泊里发现有毒藻类。避免接触浮渣水域。

이 호수에서는 독성 조류가 발생합니다. 거품이 있는 구역을 피하십시오.

В этом озере встречаются токсические водоросли. Избегайте поверхностей с водорослями.

සමුහුණු ඇති බිඳු හැඩේ වැටීම් වලින් වැළකී සිටින්න.

Trong hồ này có tảo độc. Tránh các khu vực nổi bọt.



January 2023

For more information or to report a bloom:
nwtoxicalgae.org | 360-407-6000



To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email: ovrrights@doh.wa.gov.

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DOH 333-271 May 2021

November 2025

Aquatic Plant Management

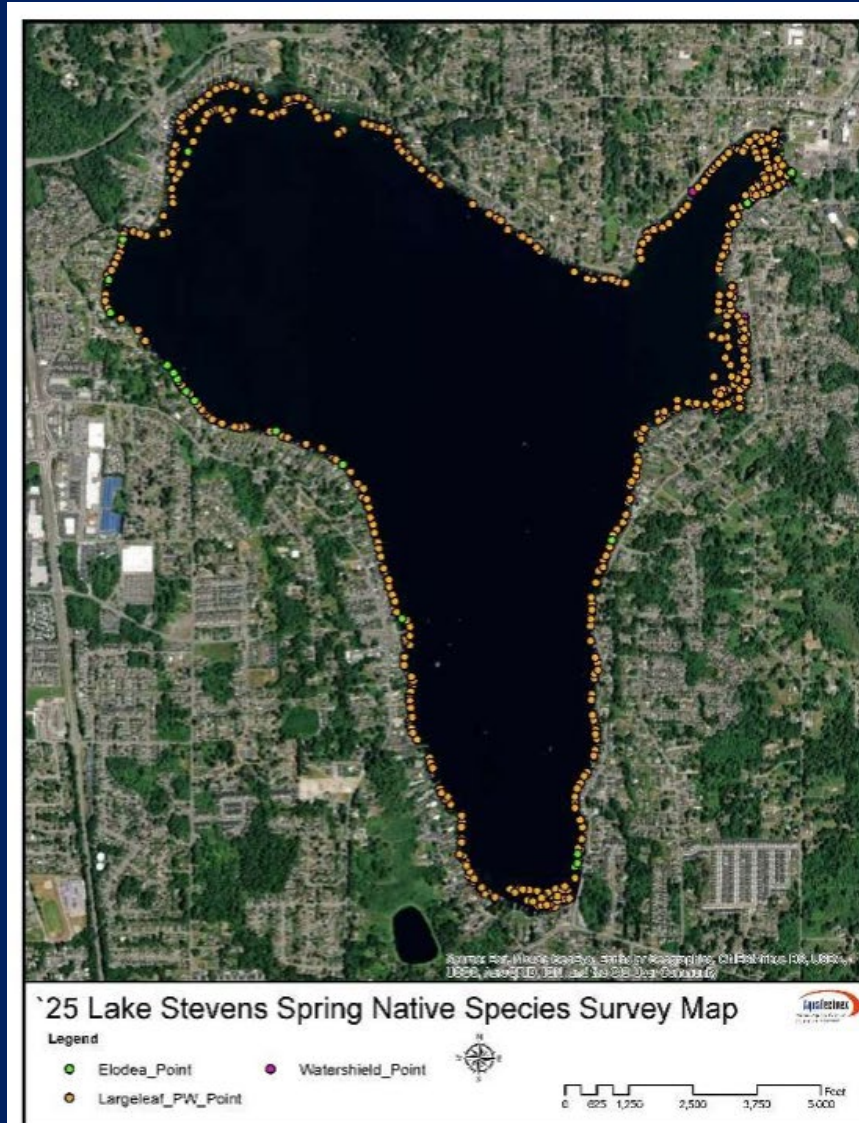
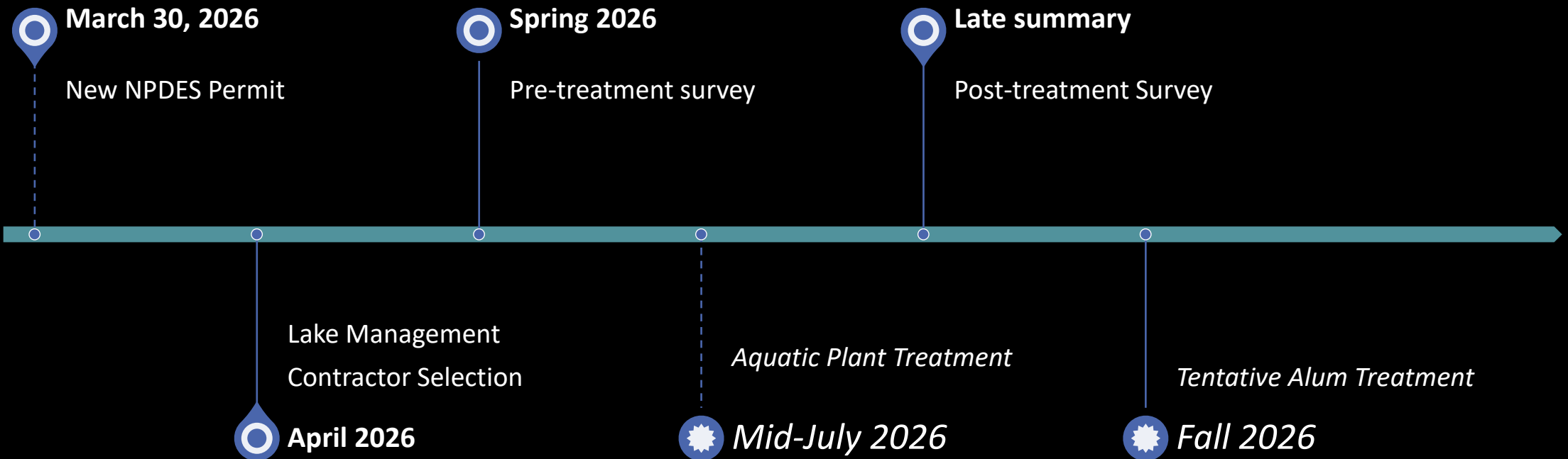


Figure 1: Spring Native Species Map



Figure 2: Spring Invasive Species Map

2026 Management Actions

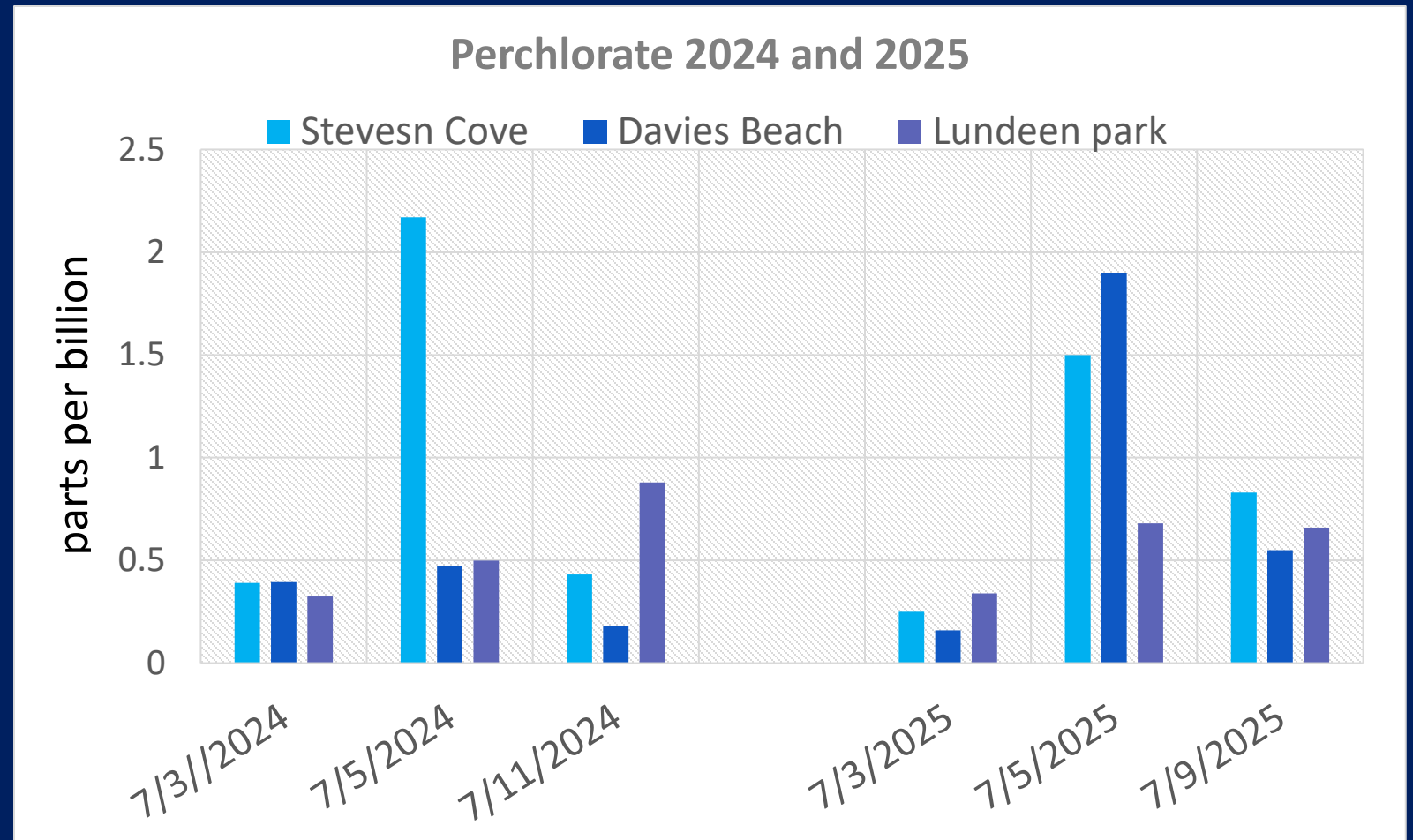


Perchlorate



- Sources (examples):
 - Natural:
 - atmosphere (ozone and chloride aerosols), volcanic eruptions, soils (mostly Southwest USA)
 - Anthropogenic:
 - fireworks, matches, flares, some fertilizers
- Functional distribution:
 - Highly soluble in water and stable
 - Adsorbs into clays
 - May be biologically degraded by microorganisms in anaerobic conditions (potentially including algae)
 - Bioaccumulates in living tissue
- Effects:
 - Still under study
 - Indication of effects on thyroid function in youth

Perchlorate in Lake Stevens



- EPA drinking water maximum contaminant level goal: 20 ppb, effects are detectable at 1 ppb
- Goldfish study showed impacts on the thyroid at concentrations starting around 1,200 ppb
- Continued perchlorate testing: \$3,000 - \$4,000/year
- Our Recommendation: Sample every 3 – 5 years to establish and track long-term trends

Other Management Programs

Routine Maintenance of Stormwater Infrastructure

- Cleaned 56 Stormwater Detention ponds and Facilities (city-owned)
- Sweep every city street 3+ times
- 900+ tons of material removed from the system
- 1,032 Basins cleaned
- ~68,000 feet of pipes cleaned
- 76 Stormwater filters replaced



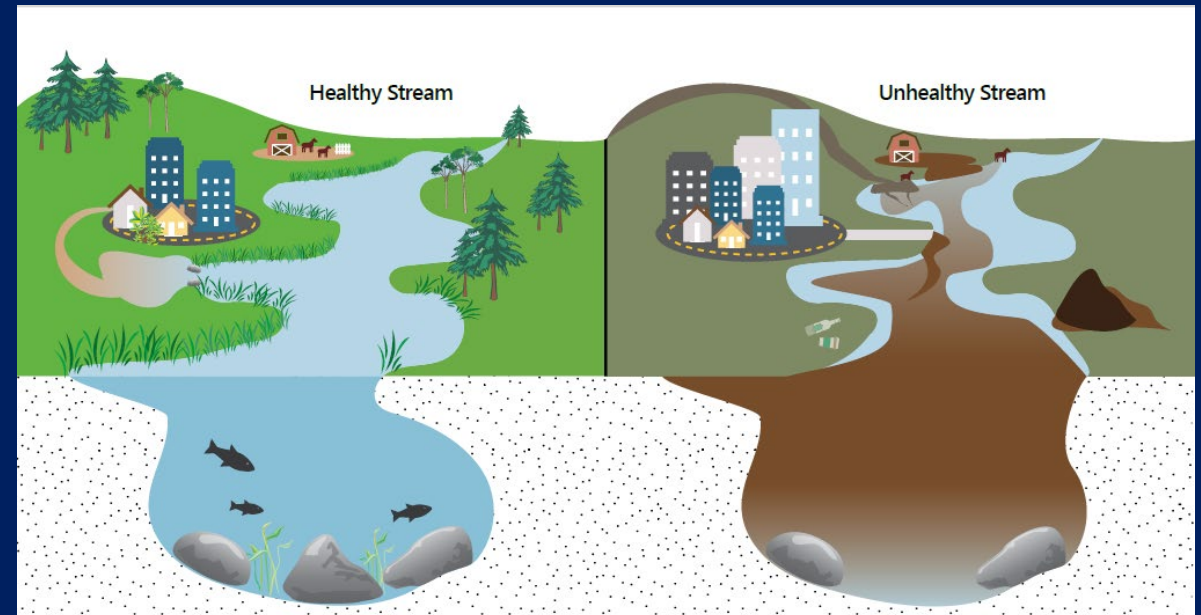
NPDES Permit – Water Quality Requirements

Long Range Plans

- Basins Plan/Comprehensive Plan
- Enhanced Stormwater Maintenance Plan

Capital Projects

- Lower Stevens Creek Restoration
- Green Stormwater Infrastructure



Community Actions

Create Healthy Shorelines



The Poop Solution

Scoop the poop, bag it, and put it in the trash.

Good human.

Trash can

Healthy families.
Healthy pets.



THE NATURAL LAWN & GARDEN
Healthy Landscapes for a Healthy Environment

Growing Healthy Soil

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Healthy Landscapes for a Healthy Environment

Composting Yard and Food Waste at Home

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Smart Watering

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natural lawn care FOR WESTERN WASHINGTON

THE NATURAL LAWN & GARDEN
Healthy Landscapes for a Healthy Environment

Natural Pest, Weed & Disease Control

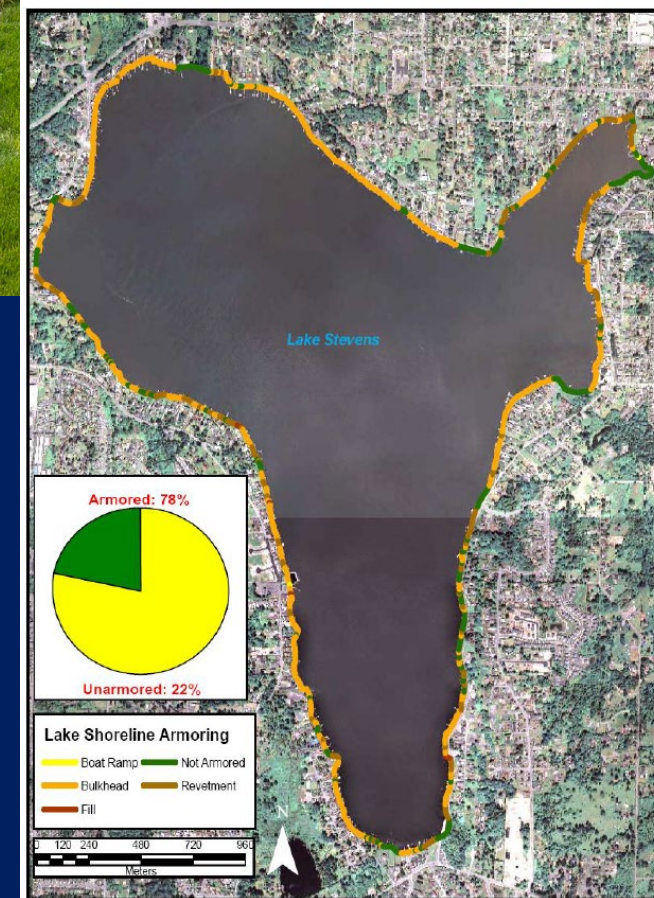
Easy practices for healthy lawns, healthy families and a healthy environment

THE NATURAL LAWN & GARDEN
Healthy Landscapes for a Healthy Environment

Choosing The Right Plants for a Beautiful, Trouble-Free Garden

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THE plant LIST



Questions



Photo Credit: Scott VanOstrand