



P-POD TECHNOLOGIES, LLC

INNOVATIVE NEW TOOLS
FOR REMOVING EXCESS
NUTRIENTS, ALGAE AND
CYANOBACTERIA FROM
SURFACE WATER

P-POD TECHNOLOGIES, LLC

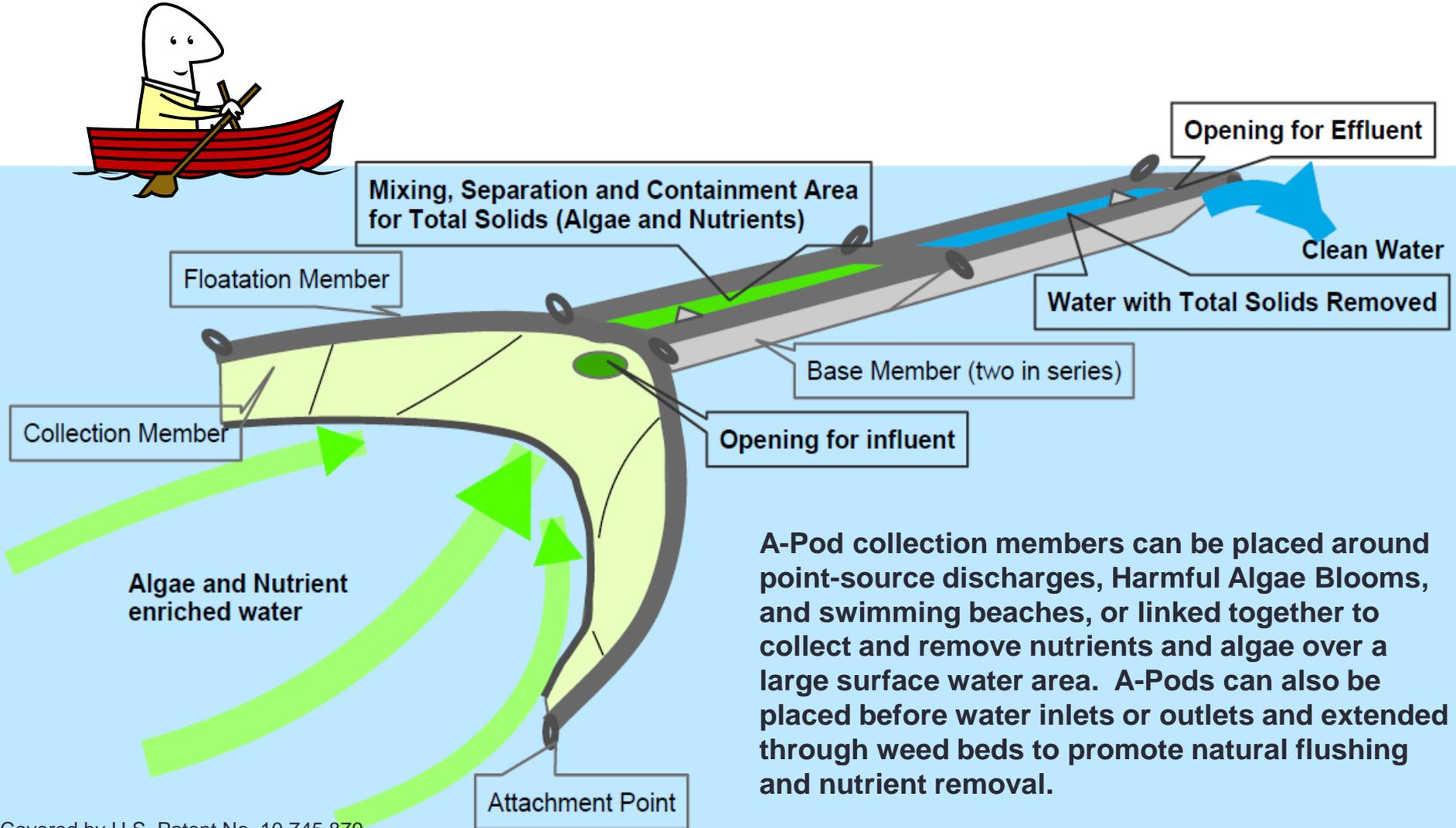
- INNOVATIVE AND NEW PATENTED TOOLS TO PERMANENTLY REMOVE TARGETED AREAS OF EXCESS NUTRIENTS, ALGAE, CYANOBACTERIA AND CONTAMINANTS FROM SEDIMENT AND SURFACE WATER.

The Tools:

- **A-POD*** – REMOVES SUSPENDED SOLIDS INCLUDING ALGAE AND CYANOBACTERIA FROM WATER
- **P-POD*** – EXTRACTS NUTRIENTS AND CONTAMINANTS FROM SEDIMENT AND ROOTED PLANTS
- **S-POD*** – CONTROLLED REMOVAL OF SOFT SEDIMENT

A-POD Removing Harmful Algae Blooms

Scalable and Readily Deployable to Capture and Remove Targeted Areas Quickly

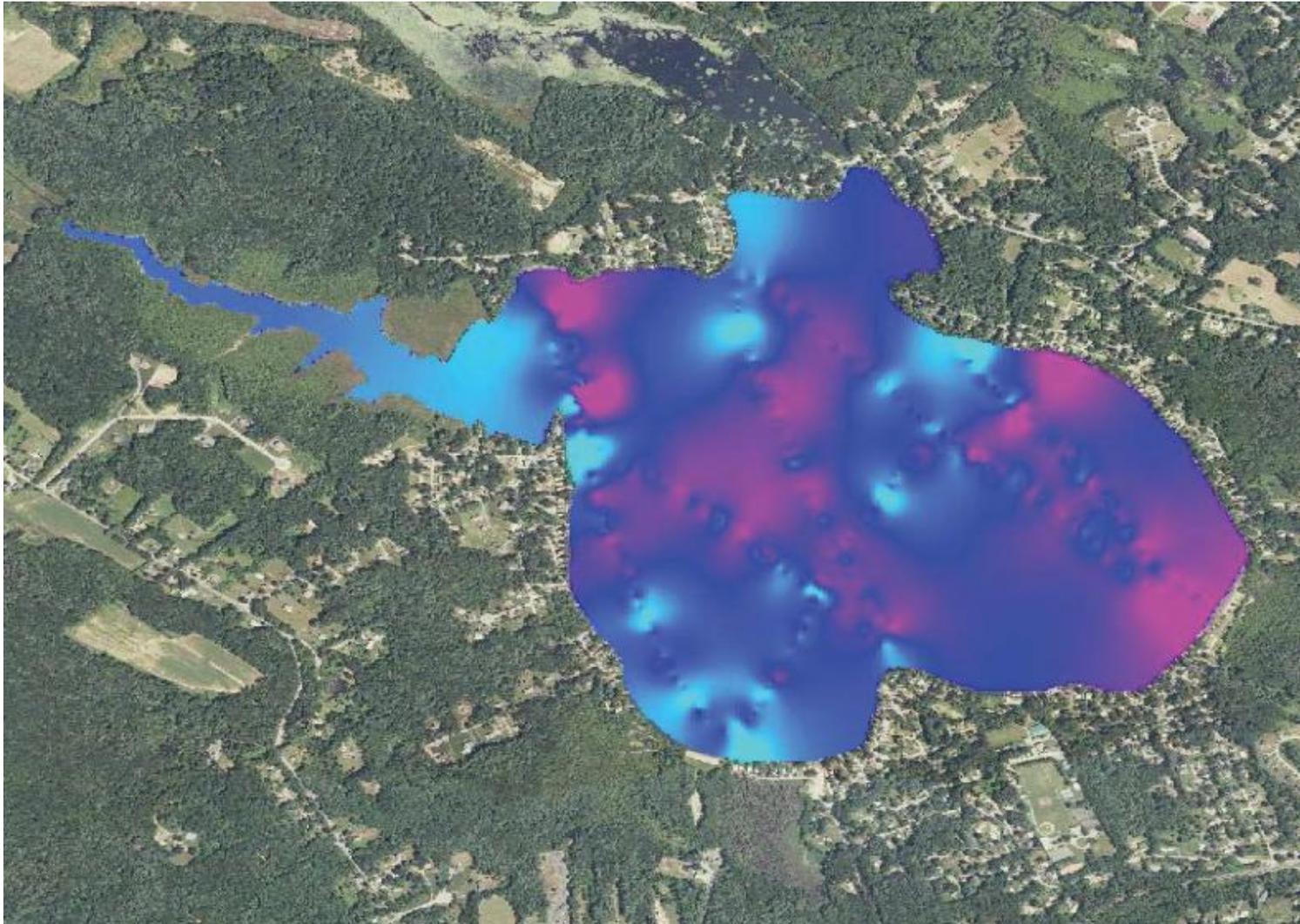


A-Pod collection members can be placed around point-source discharges, Harmful Algae Blooms, and swimming beaches, or linked together to collect and remove nutrients and algae over a large surface water area. A-Pods can also be placed before water inlets or outlets and extended through weed beds to promote natural flushing and nutrient removal.

How does the A-Pod Work?

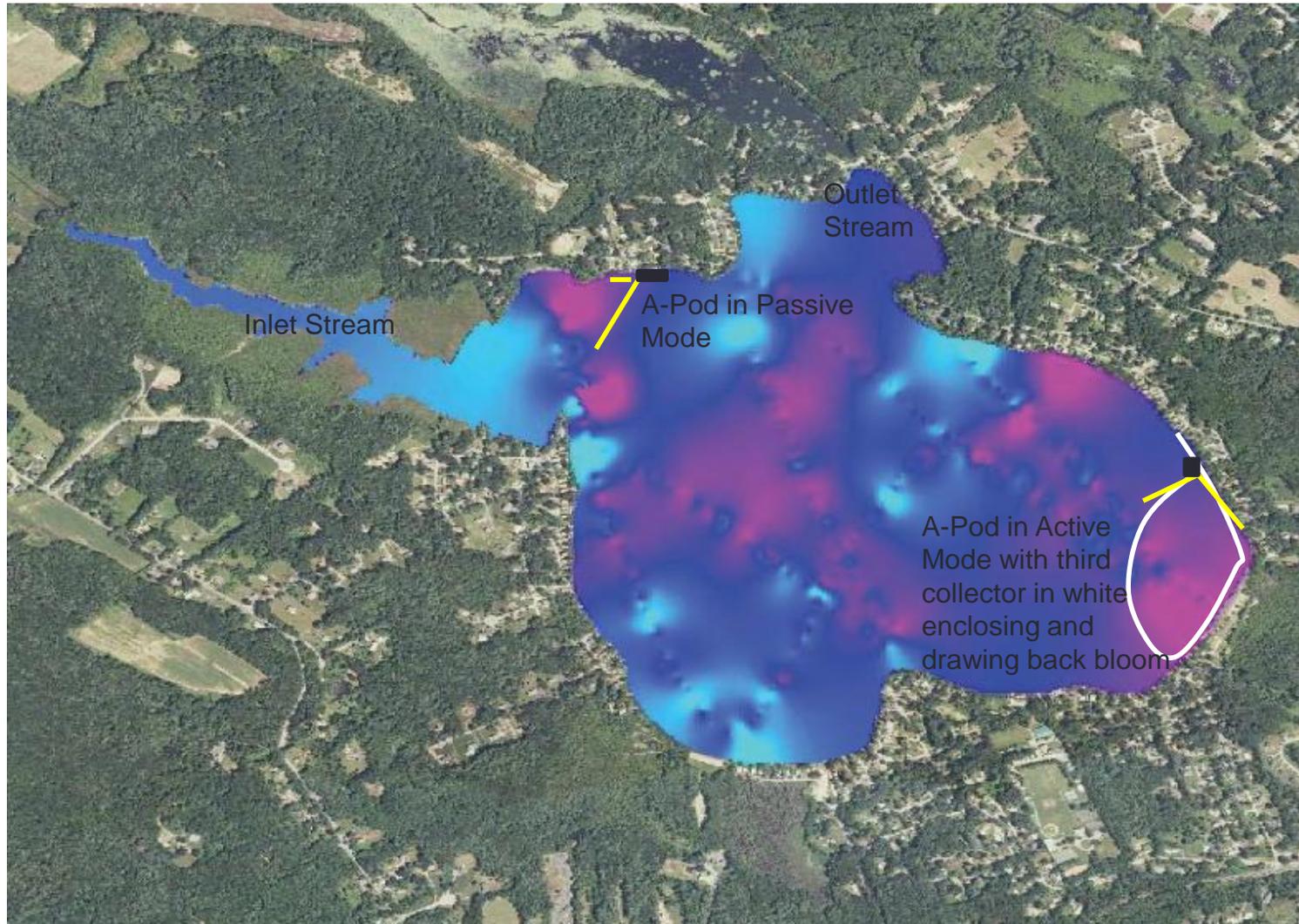
- Captures and isolates targeted suspended solids such as harmful algae blooms (HABs) within the collection members.
- The collection members can then be used either actively or passively to direct targeted suspended solids into the base member or “trap” where the solids concentrate.
- Once trapped or concentrated sufficiently, the solids/HABs can be permanently removed by flotation, settlement, pumping and/or physical removal from the base member trap.
- Use of treatment chemicals is not required. However, to assist in removal of HABs by flotation or settling, limited amounts of appropriate chemicals can be used within the isolated area of the base member trap.
- A permanent removal process with minimal waste generation or disturbance to non target areas.

Heterogeneity of Cyanobacteria in Surface Water



Red areas
have higher
cell density

Passive and Active Use of A-Pods for Cyanobacteria Removal from Surface Water



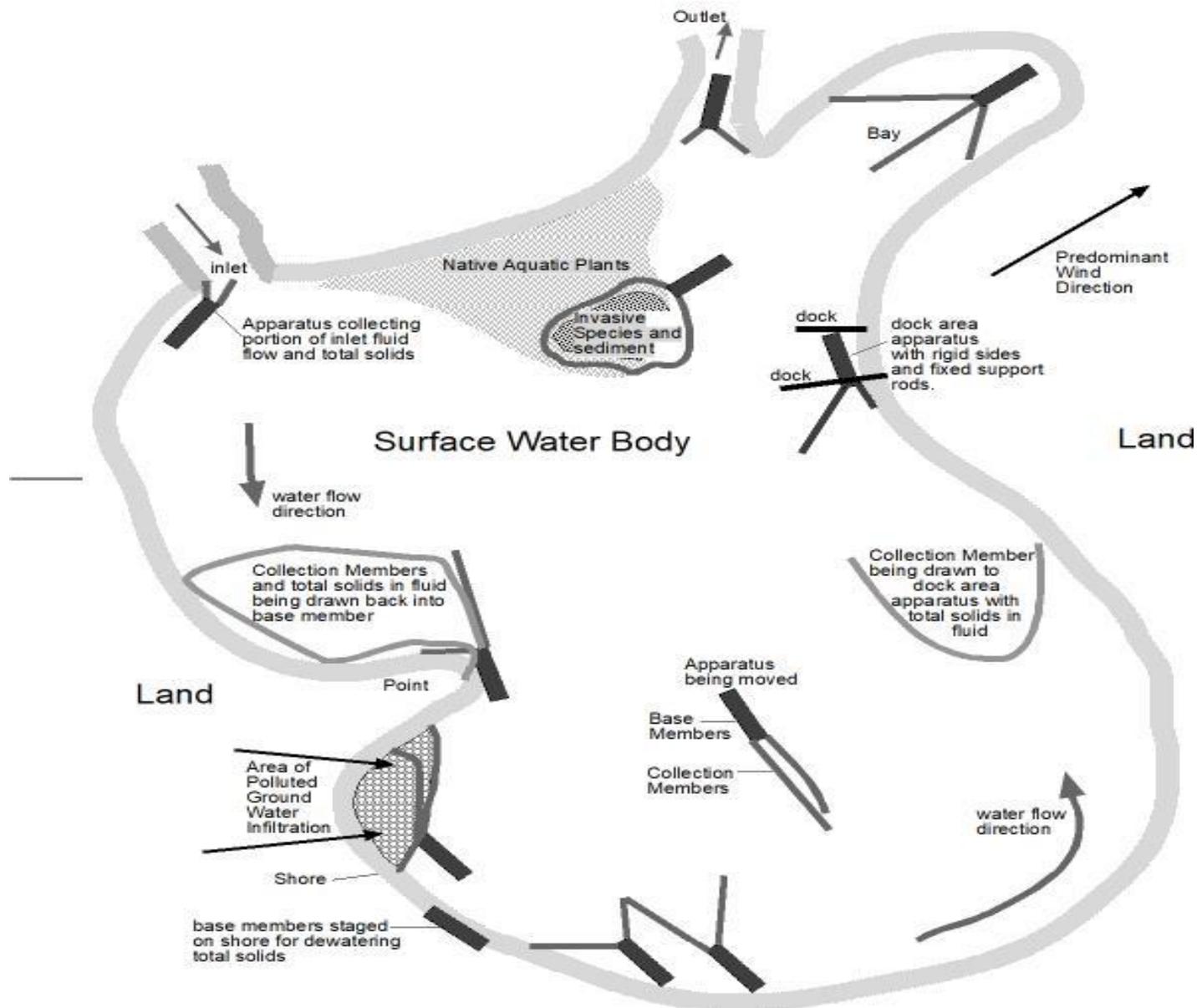
KEY:

Red areas
have higher
Cyano cell
density

A-Pod



A-Pod Application Areas



Small Prototype A-Pod in Passive Collection Mode



Small Prototype A-Pod in Passive Collection Mode



Small Prototype A-Pod in Passive Collection Mode

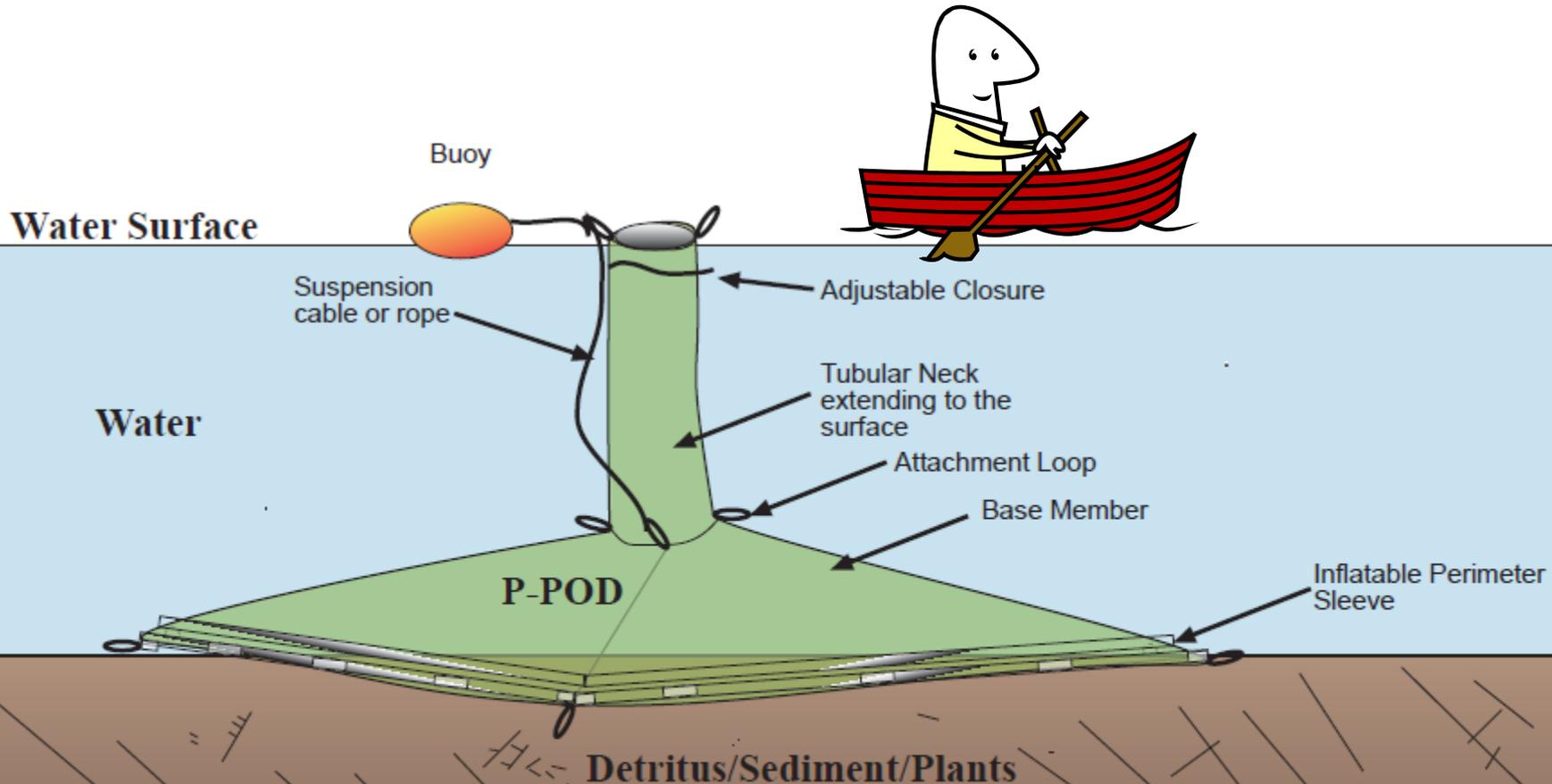


Cyanobacteria Removed from A-Pod by flotation



P-POD Extracts Nutrients from Sediment

Scalable and Readily Deployable to Extract Nutrients from Plants and Sediment

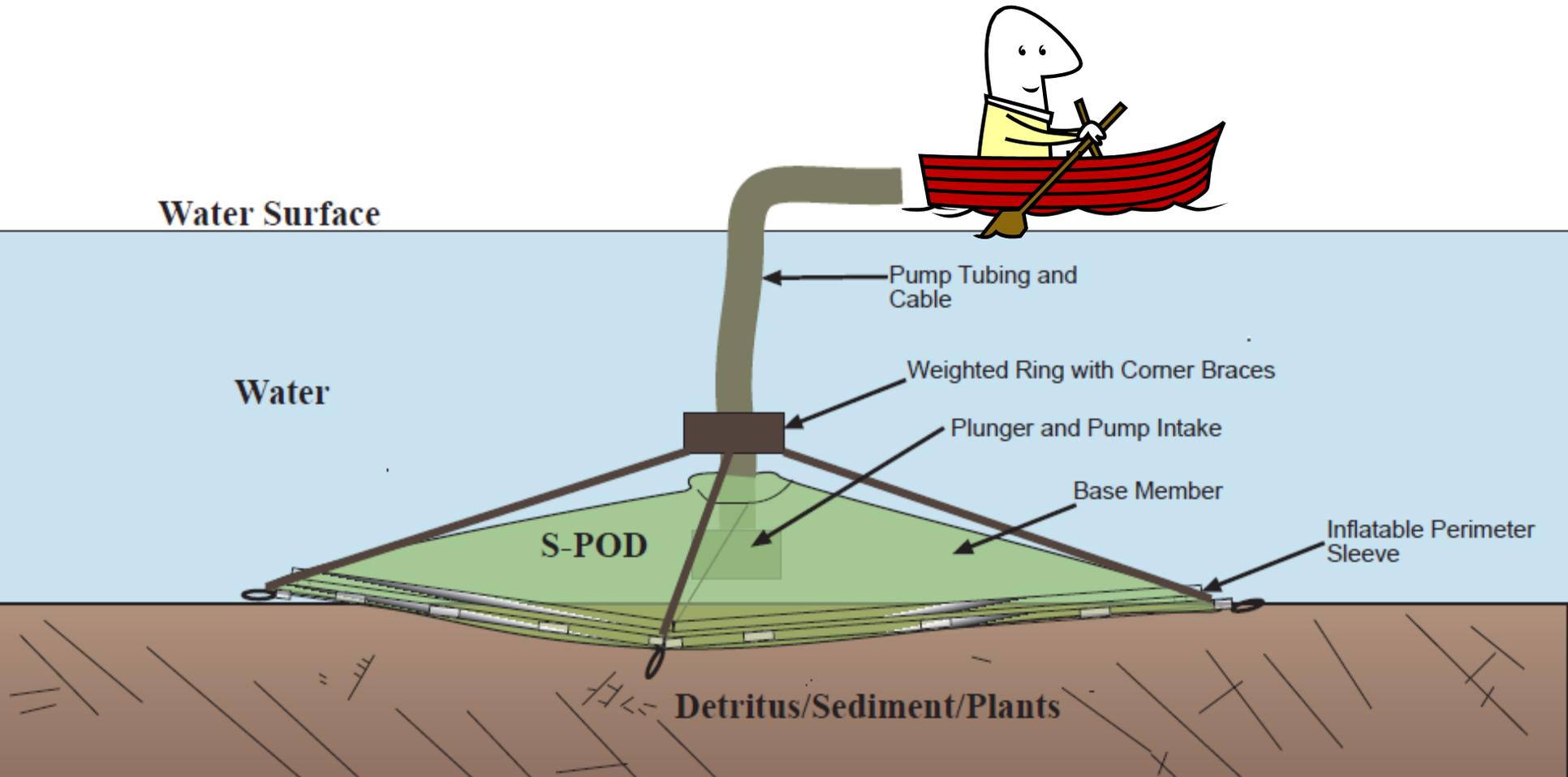


How does the P-Pod Work?

- Covers and isolates targeted sediment/plant surface area.
- Once isolated, the interior geochemistry of the P-Pod can be altered to either degrade, destroy, off-gas, and/or solubilize targeted contaminants and nutrients.
- The interior fluid can then be pumped out then geochemically altered to precipitate and filter out targeted nutrients and contaminants.
- A permanent removal process with minimal waste generation or disturbance to non target areas.

S-POD Controlled Removal of Soft Sediment

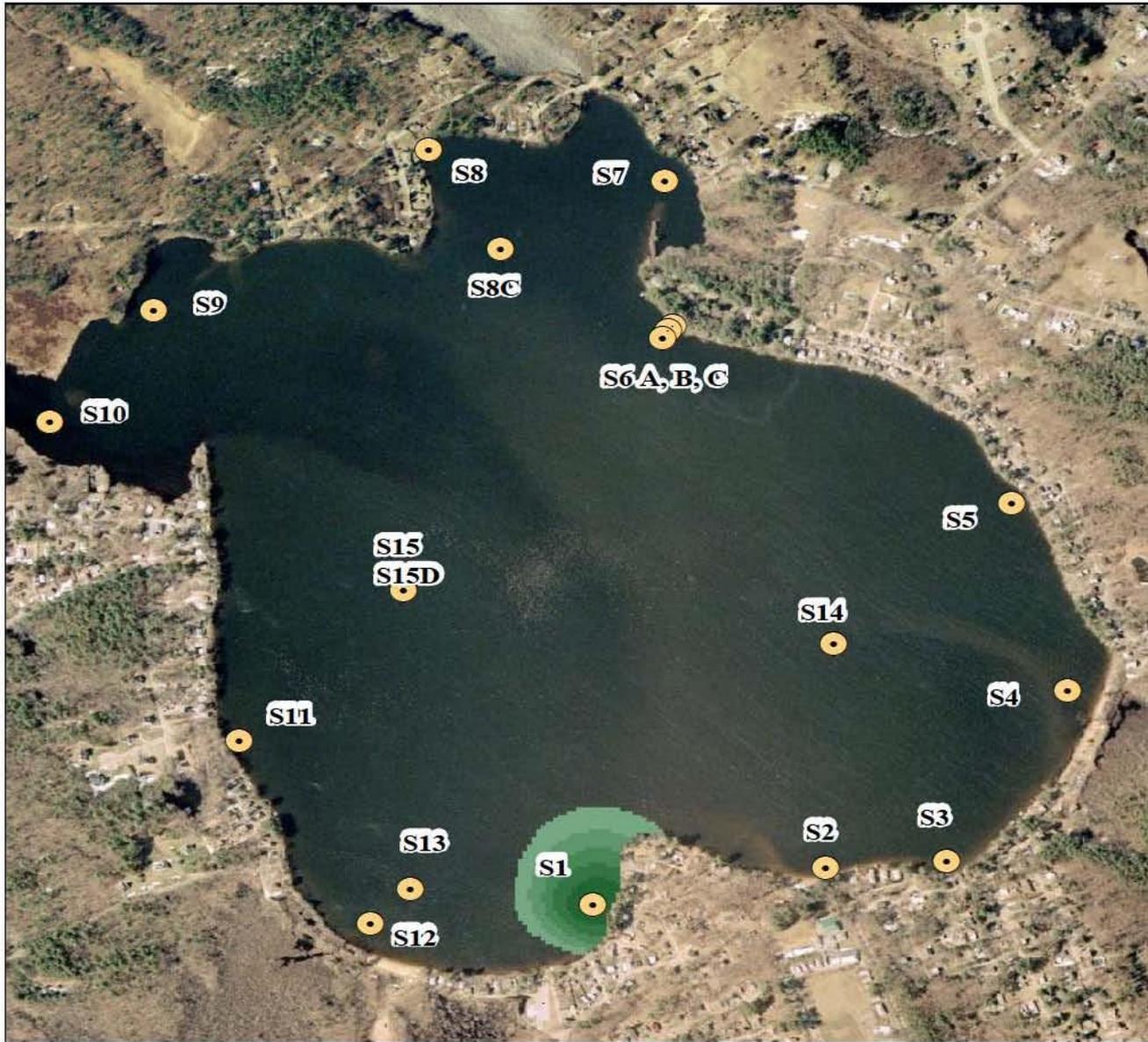
Readily Deployable to Remove Targeted Areas of Soft Sediment in a Controlled Manner



How does the S-Pod Work?

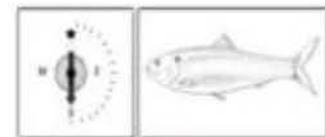
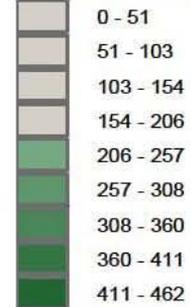
- Covers and isolates targeted sediment/plant surface area.
- Once isolated, the interior of the S-Pod can be agitated to suspend soft sediments.
- The interior fluid/sediment slurry is then pumped out, to a water- or land-based sediment collection and processing area.
- The S-Pod addresses small areas of sediment and contaminants while minimizing disturbance to surrounding areas. It also has a much smaller footprint and price when compared to traditional sediment removal methods.

Areas of Total Phosphorus Gain (August to September)



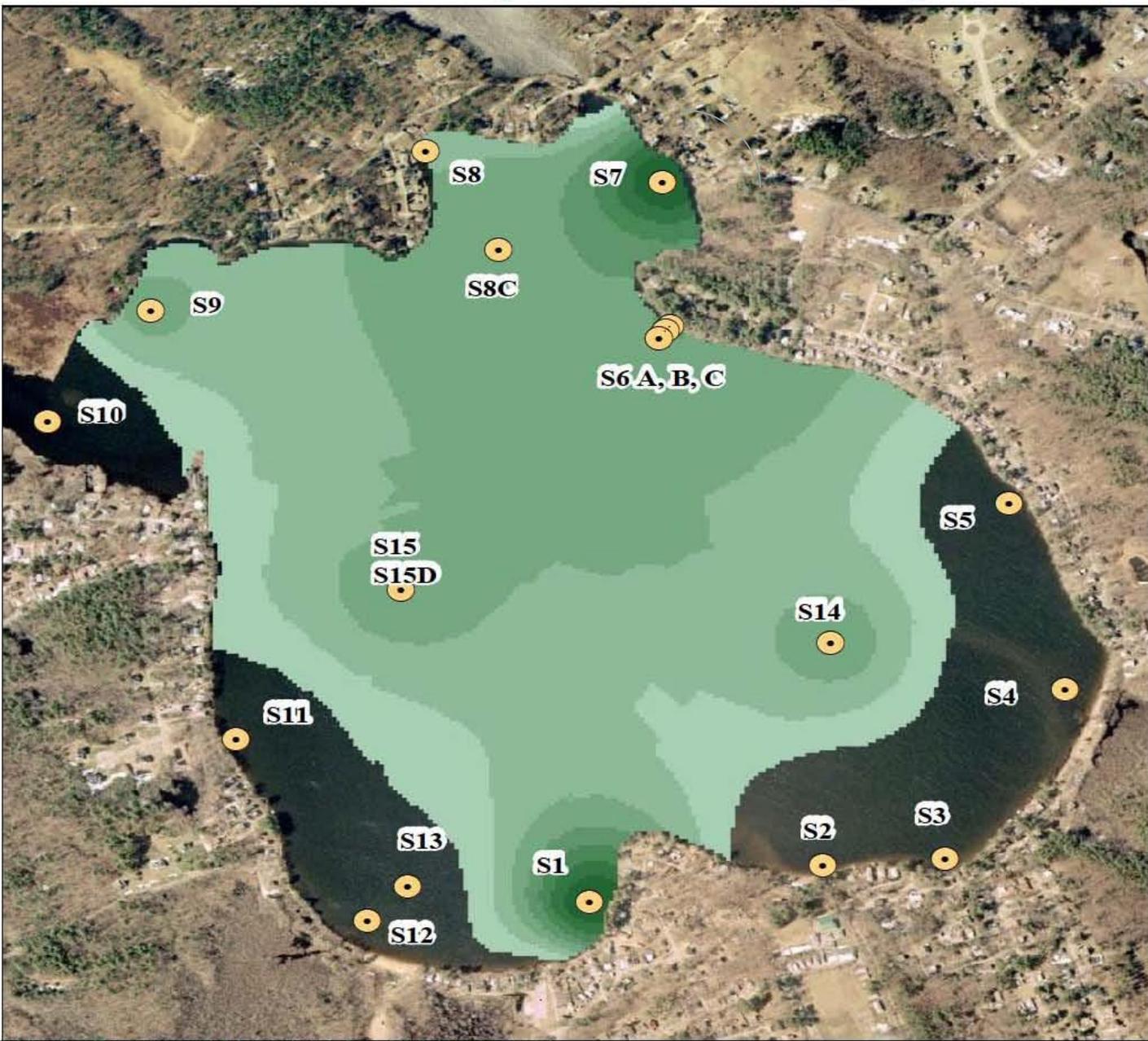
Legend

August to September Gain mg/kg



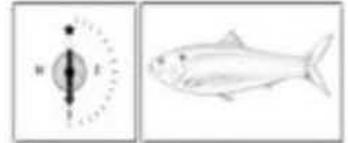
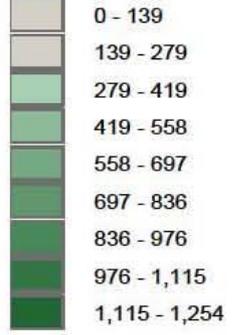
 Higgins
Environmental
Associates, Inc.
Environmental Science and Hydrology

Areas of Total Phosphorus Gain (September to November)

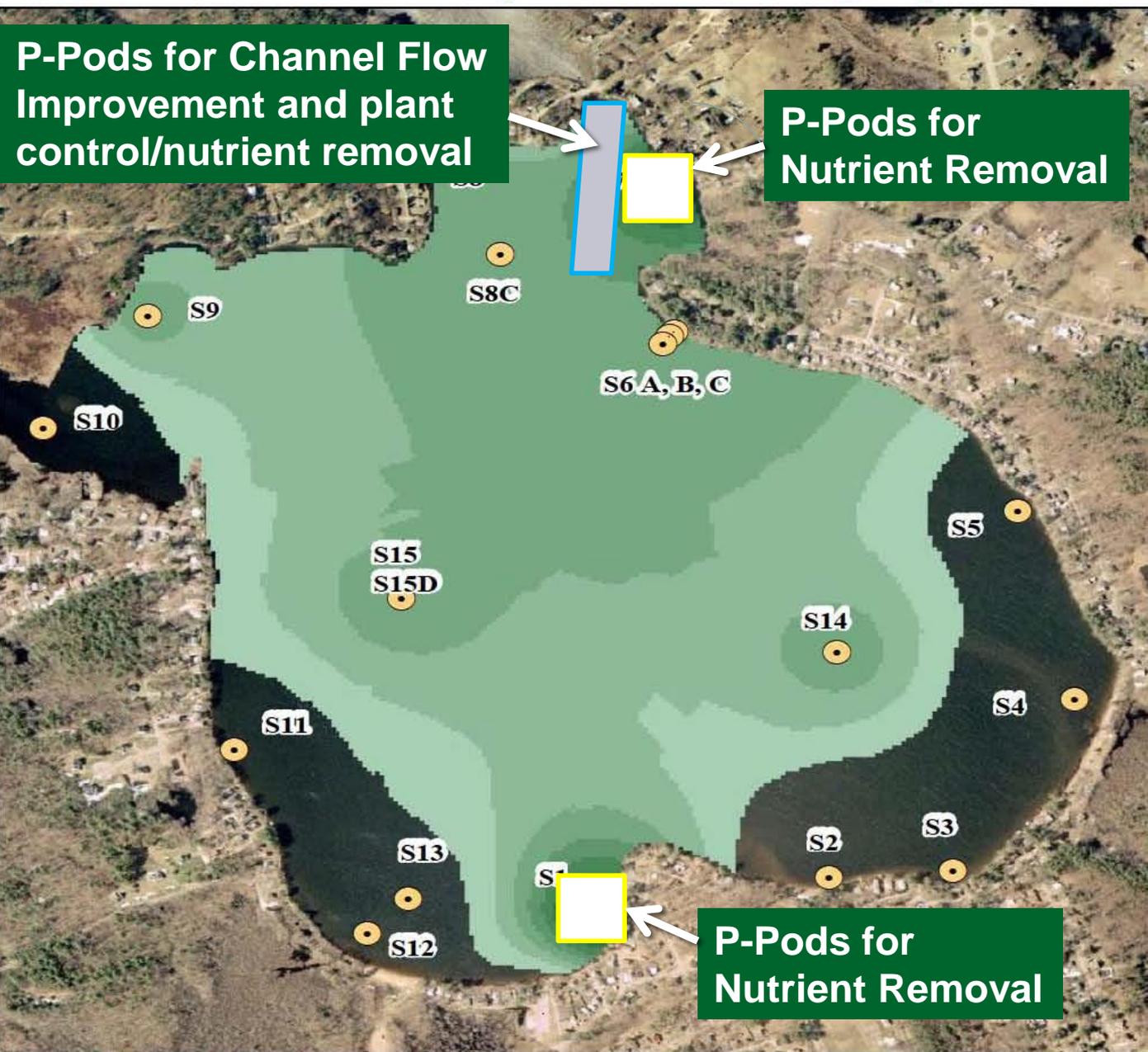


Legend

September to November Gain (mg/l)

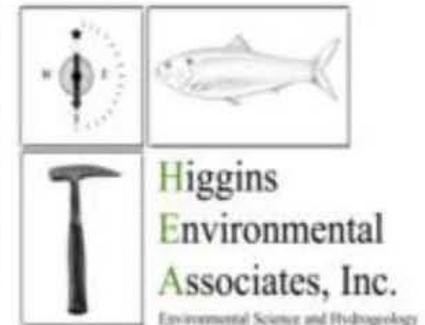
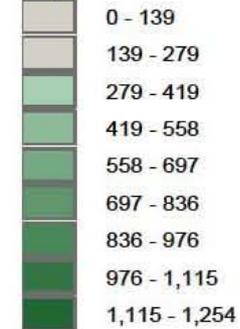


Areas of Total Phosphorus Gain (September to November)



Legend

September to November Gain (mg/l)



Summary

- The **A-Pod** captures and permanently removes excess nutrients, algae and cyanobacteria (total solids) from water. It can work in either passive or active collection modes.
- The **P-Pod** extracts contaminants and nutrients from sediment and rooted plants for permanent removal from surface water. It can also be used to limit aquatic plant growth and increase flow through water bodies by maintaining open channel flow. It can also control invasive plants and remove soft sediments.
- The **S-Pod** permanently removes soft sediment in a controlled manner while minimizing disturbance to surrounding water, sediment, flora and fauna.

CONTACT INFORMATION

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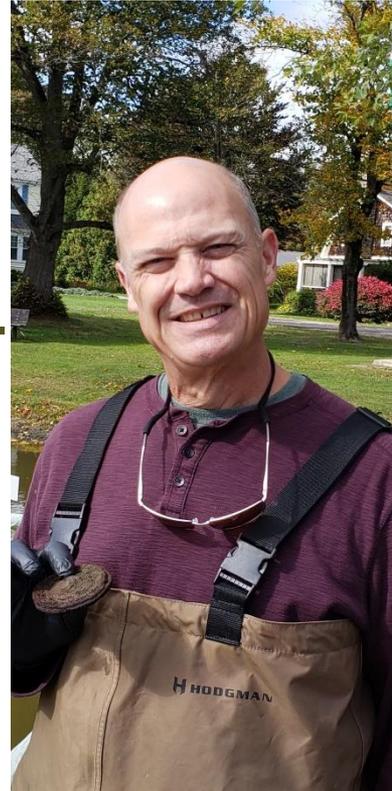
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Jon Higgins holding a Nova Scotian lake iron nodule. My doctoral research on these led to the development of P-Pod Technologies. Ask me about my research on these nodules!