USE OF PHOSPHORUS INACTIVTION TO MEET NPDES GOALS

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Augmentation of Watershed Controls

- No BMP can make the land in upper right behave like it is the land in the lower left.
- Watershed controls are needed but may not be sufficient to meet goals
- Treatment options exist that can provide flexible control

- Cost per unit of P removed is lower for P inactivation than watershed management

P Inactivation Options

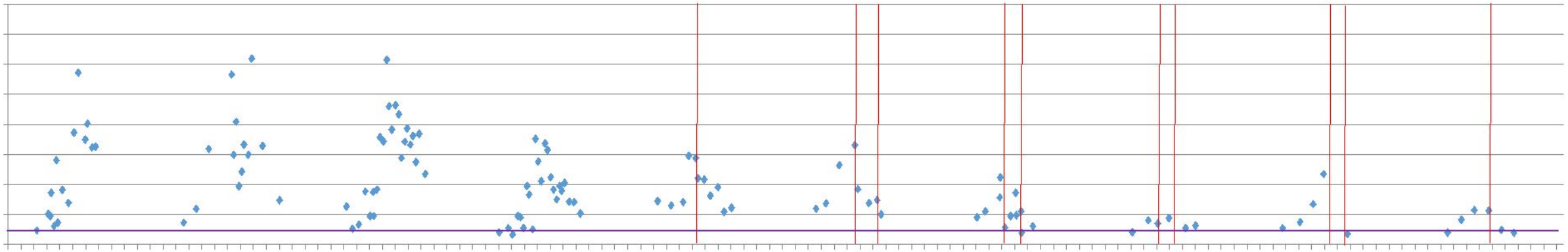
Phosphorus inactivation - anti-fertilizer treatments

- Used for water column or sediment P inactivation, flexible for remediation or maintenance
- Iron is the most common natural binder, but does not hold P under anoxia
- Calcium used in some high pH systems; limited applicability in New England
- Lanthanum more recently applied, incorporated into clay matrix in Phoslock
- Aluminum is the most commonly applied binder, multiple forms, effective, but can be toxic
- Can provide additional water quality benefits beyond P control

Example of P Control

Lower dose treatment to limit P in the water column; maintenance treatment

- **Watershed adds considerable P load with storms, internal recycling a problem during dry summer periods**
- **Al added at 1-3 mg/L once or twice per summer, reduces P, clears the water**
- **Also inactivates some sediment P; reduced internal loading over time**
- **Minimizes cyanobacteria and buys time to do the necessary watershed work**



Red lines indicate Al treatment as specified dose in mg/L

Optional Slides to Address Questions

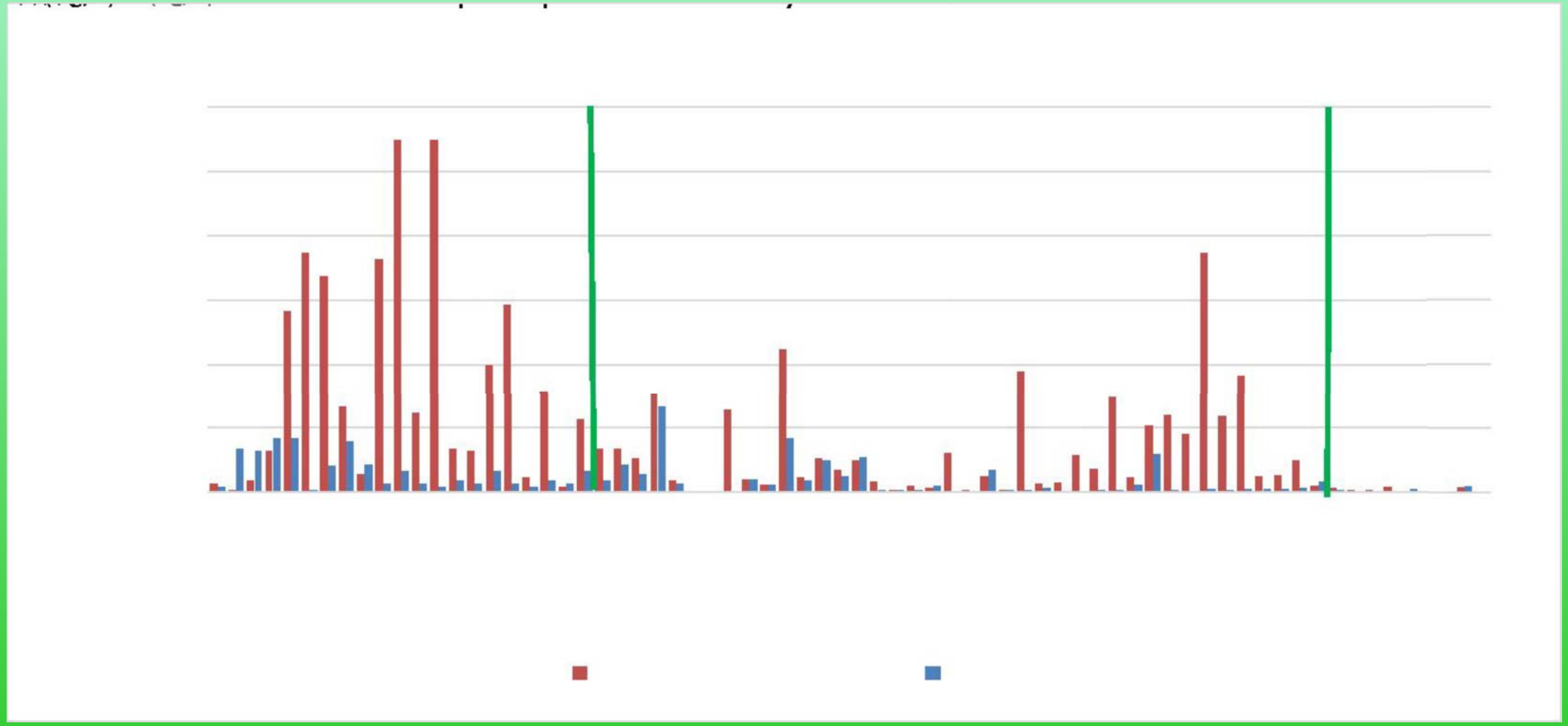
Factors in Planning P Inactivation Treatments

- Existing P load, internal vs. external
- Sources and inactivation needs – field and lab tests
- System bathymetry and hydrology
- Potential water chemistry alteration - pH, metals levels, oxygen concentration
- Potentially sensitive receptors - fish, zooplankton, macroinvertebrates, reptiles, amphibians, waterfowl
- Accumulated residues - quantity and quality

Internal Sediment P Control

Higher dose sediment P inactivation: binding redox sensitive P

Treat all area with high Fe-P and low oxygen exposure



Tributary P Control

Control through tributary P inactivation

- Inject inactivator into tributary during storm events
- Allow floc settling in designated basin
- Automated system, can be managed by cell phone