than is currently understood by seasoned climate scientists. It is better to talk about evaporative draw and how greater amounts of water are being lost from the soil. And what can be done.

CCBJ: You seem to have a negative perception of carbon markets. How do you view the European Union Emissions Trading System in the efforts of the United Nations on the clean development mechanism in the rear view mirror. How should we engage the markets and finance form a greater balance of carbon equilibrium in the atmosphere?

Hawken: With respect to carbon offsets, as you know the companies measuring, brokering, and verifying carbon offsets have been racked with scandal. The headlong rush to verify as many acres as possible turned to satellite monitoring, which covers large tracts of land.

Satellite sensors measure spectral signals from gases emitted by the soil to "infer" properties that generally correlate with carbon. The deeper concern is that offsets are exactly that. You emit a ton of CO2 and pay someone to sequester or reduce a ton of CO2 by other means. That is a gerbil wheel system that does nothing. A company should buy onsets. Onsets pay it forward instead of neutralizing current emissions. At the same time, I do love the way the EU is taking this head on with strict reporting guidelines. ☼

Carbon is the only element that animates the entirety of the living world. Though only a fraction of Earth's composition, our planet is lifeless without it. Yet it is maligned as the driver of climate change, scorned as an errant element blamed for the demise of civilization.

SePRO and EutroPHIX Broad Capacity in Water Quality Aligns With Growing Harmful Algal Bloom Market

Founded in 1994, **SePRO** is a leader in environmental solutions, specializing in water and land ecosystem restoration. With a foundation in science and a commitment to environmental stewardship, SePRO partners with public, private, and individual sectors across the United States to develop strategies that enhance environmental health. Stanley Capital Partners (SCP) and Goldman Sachs Alternatives recently invested in SePRO, further accelerating SePRO's consistent growth and ability to provide solutions and technical support to its customers in water management, nutrient mitigation, and environmental restoration.

Dr. West Bishop, Algae Scientist and Water Quality Research Manager. *Dr. Bishop focuses on developing and implementing solutions for nuisance algal and cyanobacterial management, including proactive nutrient mitigation. He is a Certified Lake Manager and collaboratively works to solve algae and water quality issues in diverse systems. Dr. Bishop has been with SePRO for over 14 years. He provides technical support to EutroPHIX, a division of SePRO focused on nutrient mitigation and water quality restoration.*

CCBJ: How has the harmful algal bloom (HAB) market evolved over the last decade? What major shifts have you observed in terms of demand, regulation, or public awareness?

Bishop: Over the past decade, the HAB market has evolved significantly in response to growing environmental and public health concerns. Local and state regulations have expanded, especially for recreational and potable water uses. Departments of health now recommend threshold levels for cyanobacteria and their associated toxins—levels which, when exceeded, trigger the shutdown of public access to affected water bodies.

At the same time, public awareness has grown. As HABs become more frequent, stories about their impacts—especially toward pets, livestock, and other domestic animals—have gained traction in the media. The increased visibility has pushed HABs into the mainstream environmental conversation and driven demand for better monitoring and management solutions.

This growing awareness—paired with a clearer understanding of how HABs produce toxins and the various ways people and animals can be exposed—has intensified pressure on both public agencies and private companies to develop more effective, science-based cleanup and prevention strategies.

CCBJ: Have you noticed a shift in who your key stakeholders or customers are today versus five years ago? Are more municipalities, private developers, or even agricultural businesses now engaged?

Bishop: Over the past five years, we've seen a notable shift in stakeholder engagement. Municipalities, homeowner associations, and government agencies have become more vigilant and engaged, largely driven by growing public concern over the health risks posed by HABs.

There's a heightened sense of responsibility to protect their water sources—especially potable and recreational waters—from contamination. In addition to health concerns, factors like potential liability, declining property values, and the desire for a reliable water supply have motivated broader participation in HAB monitoring and treatment efforts.

CCBJ: What are the most surprising market trends you've seen recently in eutrophication or phosphorus management? Anything unexpected emerging from lesser-known sectors or geographies?

Bishop: Recently, one of the most notable and surprising trends has been a shift towards proactive nutrient management. A growing number of stakeholders now recognize the sources of nutrient pollution and the extent to which water bodies have accumulated these nutrients, resulting in more proactive mitigation measures to ultimately offset blooms. As awareness deepens, there's a clear movement away from surface-level fixes toward addressing the root causes of eutrophication such as accumulation of phosphorus and broader ecosystem disruption created by HABs.

CCBJ: In what ways is climate change accelerating or altering the nature of HABs? Are you seeing blooms appear in places or seasons they historically did not?

Bishop: The number of HABs has increased in recent years, with climate change playing a likely role. For example, Lake Superior is now experiencing more HABs than previously observed. Rising temperatures and a reduced ice coverage are among the key contributing factors.

CCBJ: Has the intensity or duration of HABs changed in the last few years? If so, how is that influencing your treatment prescriptions and monitoring timelines?

Bishop: HABs are starting earlier in the season and lasting much longer—extending far into the fall and early winter months, which is atypical. In southern states, many water bodies have HABs year-round. We're also seeing a spread of different types of cyanobacterial HABs, which present new challenges.

These variants are harder to detect because they could form dark benthic mats and be distributed throughout the water but can only be detected through microscopic evaluation. These changes in bloom duration, intensity, and complexity have required us to adapt our treatment strategies and expand our monitoring timelines to ensure effective and timely intervention.

CCBJ: What role does technology now play in identifying and managing harmful algal blooms? Can you share how remote sensing, satellite data, or AI-based modeling are being integrated into your work?

Bishop: Technology now plays a critical role in identifying and managing HABs. Advancements in monitoring tools have significantly increased over the past few years. The ability to readily identify and track HABs from satellites and remote sensing helps in understanding how systems have changed. These findings help direct management initiatives.

This also shows on a large scale the impact of applied mitigation efforts. Advancements on all scales, such as in situ nutrient analyses and real-time pigment analyses, are enabling the collection of more data to inform management decisions and adapt rapidly to changing conditions.

SePRO recently acquired Green Eyes, LLC, a company specializing in surface water quality monitoring solutions. Their product portfolio includes solutions for nutrient monitoring, water sampling, sediment erodibility, and developing real-time data displays. Within their portfolio is NuLAB – a cutting-edge technology for automated nutrient monitoring in surface water.

This chemical analysis platform and Green Eye's larger portfolio expands SePRO's ability to proactively monitor water quality and strengthens its capacity to diagnose issues and deliver targeted, effective water management solutions – an essential capability as demand for sustainable, clean water solutions grows.

CCBJ: Are you developing or using predictive modeling to anticipate HAB outbreaks before they become visible or toxic? What's the potential of this technology for lake managers and governments?

Bishop: Predictive modeling is increasingly integral to our approach in anticipating HAB outbreaks and helps us reinforce the need for ongoing management. Often, systems have recurring HABs that may worsen. Using models, we can demonstrate the presence, extent, and increasing severity of these blooms occurring without intervention. As eutrophication is increasing and climate change is accelerating, the intensity of these HAB events is often made worse. Showing this change can help make informed decisions on the need for intervention.

CCBJ: What kinds of partnerships have been most effective in scaling your impact? Any public-private collaborations you're particularly proud of?

Bishop: We partner with a diverse array of organizations to increase our impact in protecting water resources. Even smaller projects often involve multiple stakeholders, and we've found strong champions among many lake groups, as well as state and federal government agencies. SePRO also collaborates with universities and has provided foundational research to guide implementation.

CCBJ: What are the biggest regulatory or funding challenges your clients face when trying to address phosphorus pollution and HABs?

Bishop: One of the biggest challenges our clients face is securing funding—whether though grants or by lobbying for state and federal funds. Setting realistic timelines and understanding the financial commitment required for full-scale restoration can also be significant hurdles.

Occasionally, additional on-site assessments need to be conducted for regulatory purposes, but due to the large body of data and ecologically benign nature of the phosphorus mitigation technologies used, regulatory hurdles typically are overcome. ☼