

# NACWA

## Nutrient Summit

### Outcomes and Issue Paper

March 2011

## Executive Summary

NACWA convened a Summit of representatives from its public agency and private affiliate members last Fall to outline the essential elements of an effective and equitable national nutrient control framework. NACWA understands the need to make continued headway on controlling nutrient pollution and used the Summit to discuss new approaches to nutrient goal development, state programs that are making real progress, and what the clean water community can do to help improve the country's efforts to address nutrients. Given the ongoing debate surrounding the development of nutrient criteria and the frustration with current efforts felt by all stakeholders, NACWA is committed to using the discussions at the Summit as a starting point for a reinvigorated dialogue with EPA and the states on rational approaches for addressing nutrients.

During discussions at the NACWA Nutrient Summit, a series of Guiding Principles for a rational and scientifically-sound approach to controlling nutrient impacts emerged. In addition to outlining the Guiding Principles, Summit participants worked to develop several key recommendations for improving current nutrient control efforts. While considerable attention was placed on what the 'ideal' program would look like, Summit participants highlighted where existing realities and the need to make additional progress, in some cases where the underlying scientific basis for controls may still be uncertain, were both important considerations.

Elements of the top four recommendations detailed in this paper are new or different from the 'current business as usual' approaches, but NACWA believes they have significant promise in potentially breaking the current logjam on nutrient issues in many parts of the country. The remaining recommendations outline where additional work is needed to make better use of existing tools and develop equitable control programs.

Though the Summit's ground rules limited discussions to changes and actions that could be accomplished using current Clean Water Act (CWA) authorities, Summit participants continually raised the issue that more comprehensive change, potentially to the CWA itself, is needed to fully embrace a holistic watershed-based approach in which all sources are equitably included and ensure the most effective solutions to impacts are implemented.

## Introduction and Purpose

NACWA convened a Summit of representatives from its public agency and private affiliate members in September 2010 to outline the essential elements of an effective and equitable national nutrient control framework. NACWA understands the need to make continued headway on controlling nutrient pollution and used the Summit to discuss new approaches to nutrient goal development, state programs that are making real progress, and what the clean water community can do to help improve the country's efforts to address nutrients. Given the ongoing debate surrounding the development of nutrient criteria and the frustration with current efforts felt by all stakeholders, NACWA is committed to using the discussions at the Summit as a starting point for a reinvigorated dialogue with EPA and the states on rational approaches for addressing nutrients.

This issue paper outlines a series of Guiding Principles that Summit participants felt were essential for a nutrient control program to succeed and a set of recommendations that complement the Guiding Principles and provide more detail on what can be done to better address the Nation's nutrient challenges.

### Complexity of Nutrient Issues Requires Scientific, Data-Driven Approaches

Summit discussions ranged from broad thematic concepts to more specific and potentially viable control frameworks for nutrients. Summit participants recognized that some of the Nation's waterbodies are suffering from excess levels of nutrients and that public agencies need to be an equitable partner in any solution to this growing challenge. The Gulf of Mexico and Chesapeake Bay are two of the most well-known impacted waterbodies, but nutrients are impacting waters of all types and sizes across the United States. In addition, population growth, changing land use patterns, and other drivers are threatening those waters that to date have only been minimally impacted by human activity.

Action is needed, but as the level of attention being placed on the nutrient issue continues to increase federal, state and local water quality managers are realizing the true magnitude of the challenges that lie ahead. The unique and complex relationships between nutrients and potential impacts in any given waterbody require that we use new approaches to establish nutrient goals and control nutrient impairments. For example, reduced nutrient levels are not always better for an aquatic ecosystem and there are numerous confounding factors that impact how a particular organism or ecosystem responds. These issues are even more complex when evaluating nutrient impacts on flowing waters, such as rivers and streams, or in coastal areas.

Understanding the biology of the waterways we all want to protect is essential to developing effective nutrient goals and controls. For nutrients, there is often no 'bright line' level of nutrients below which aquatic ecosystems will be protected and the use of such bright-line levels could result in undesirable impacts on organisms that may thrive under different conditions. Other environmental stressors including sediment loads, habitat destruction and hydromodification resulting from dams/impoundments can have as much or more of an impact on the health of an aquatic ecosystem than nutrients and can affect how these systems respond to varying nutrient loads.

### Efforts at State Level Offer Promising Examples of a Potential National Approach

Since 1998, EPA has been urging states to develop numeric nutrient criteria both to facilitate restoration efforts and to ensure protection of pristine or minimally impacted waters. While EPA has generally maintained a hands-off approach, preferring — appropriately — to let the states take the lead on criteria development, environmental NGOs, dissatisfied with the pace of existing efforts, have petitioned or taken initial steps to petition EPA to promulgate numeric nutrient criteria (e.g., Florida, Wisconsin, Kansas, and the Mississippi River Basin). Some states have made progress in developing numeric nutrient criteria for lakes but many states have had difficulty developing numeric criteria linked to in-stream responses for flowing waters. The resulting delay in implementing the Clean Water Act's (CWA) water quality-based programs, including the development of total maximum daily loads (TMDLs), has led some stakeholders to suggest that the water quality approach be abandoned in favor of technology-driven nutrient controls for point sources.

NACWA strongly believes that reliance on approaches that do not account for the varying ecological effects of nutrient pollution, including misguided criteria development efforts and one-size-fits-all technology fixes, will result in major expenditures for point sources with minimal or no improvement to water quality for many waters. These approaches will also most likely fail to solve the problems associated with controlling nonpoint sources. How water quality impacts from nutrients are assessed and addressed must ensure that management actions will result in water quality improvements, provide lasting benefits, and be affordable and sustainable. At the same time, there is increasing interest in making progress in the interim, while additional data are collected and the uncertainty surrounding control efforts is addressed.

Recent efforts at the state level provide promising examples of how we may best make additional progress on the challenge of controlling nutrients. As discussed during the Summit, where dischargers have worked cooperatively with state environmental agencies, nutrient control efforts have been developed that provide the necessary environmental protections, while affording the flexibility needed to ensure those programs can be implemented in a more cost-effective, targeted fashion. While not using the same model in every case, other states have developed or are proposing approaches that better reflect the unique properties of nutrients. Some of these programs use a more iterative approach to addressing the nutrient challenge — making progress in the near-term despite uncertainty, but providing flexibility to ensure resources are only expended where they are most needed. Given the current limitations under the federal CWA to address nonpoint sources of nutrient pollution, some of these state efforts have also been more effective at leveraging state authorities to address nonpoint contributions. More work is definitely needed, but these cooperative, state-level successes can serve as a model for additional progress.

### Creative, Long-Term Solutions Also Vital to Address Nutrient Challenges

NACWA is also working on a parallel track at the federal level to explore potential legislative solutions that support a watershed-based approach to water quality improvement and address all sources of nutrient pollution. Discussions at the Summit focused primarily on those actions that can be taken now, using existing authorities under the Clean Water Act and state law. Nevertheless, Summit participants underscored that for real progress to be made on the nutrient issue in the long-term, more comprehensive changes are needed to ensure all sources of nutrients are equitably incorporated into any viable solution.

# Guiding Principles for a More Rational National Approach to Addressing Water Quality Impacts

During discussions at the NACWA Nutrient Summit, a series of Guiding Principles for a rational and scientifically-sound approach to controlling nutrient impacts emerged. The Guiding Principles and much of the discussion at the Summit were prefaced on the conclusion that a new, novel approach to developing and implementing nutrient criteria in the U.S. is needed.

The existing federal model for numeric criteria development and implementation is not working for nutrients in all waterbody types. The delay in implementing nutrient controls is largely due to the fact that we are trying to use a system that was designed for more traditional toxic pollutants – a system that assumes targeting only the levels of ‘pollutants’ (nitrogen and phosphorus in this case) will improve water quality and prevent pristine waters from becoming impaired. A number of states are already exploring new approaches, but more needs to be done to ensure other states can benefit from this work. Discussions at the Summit also recognized that in some parts of the country, where nutrient controls will clearly be needed, action may be appropriate in the near-term despite ongoing efforts to further reduce the uncertainty surrounding the necessary controls.

The Guiding Principles include:

- Water quality assessment and monitoring programs must be sufficiently comprehensive and robust to provide the information needed to support criteria development and document the need for controls to the extent any are required.
- Greater emphasis must be placed on evaluating use attainability and use refinement, if needed, before criteria are developed and controls imposed.
- Numeric nutrient water quality criteria must:
  - Be technically and scientifically defensible, developed to reflect the full range of biological, chemical, and physical properties of the waterway, and protect designated uses;
  - Be based on a demonstrated and quantified cause and effect relationship and appropriately qualified by the uncertainty in those relationships; and
  - Not be used as the basis for imposing nutrient controls unless a nutrient caused biological impact has been confirmed or a potential for impact can be demonstrated through a nutrient-specific, technically/scientifically defensible reasonable potential evaluation.
- New and innovative approaches for expressing nutrient water quality criteria or goals, instead of simple expressions of total nitrogen and total phosphorus concentrations, must be developed and encouraged.
- The sources of nutrients and their relative contributions in a particular watershed should drive the selection of control options; there should be flexibility to consider a range of point source control options, including water quality and technology-based approaches.

Option selection should be a state-driven effort and include the development of an accountability framework that ensures equitable reductions from all sources.

- Flexibility, both in developing water quality criteria and implementation (e.g., better use of existing CWA tools like variances and permit expressions such as longer averaging periods), is needed to account for the uncertainty due to the unique ecological interactions between nutrients and designated uses.
- An adaptive, watershed management approach must be used to ensure continued progress toward long-term water quality goals.
- Any required nutrient controls for point sources must be technically achievable, ensure that required investments are sustainable, and provide measurable benefit to the community.

## Recommendations for Improving Current Approaches

In addition to outlining the essential elements of any nutrient control program (the Guiding Principles above), Summit participants worked to outline several key recommendations for improving current efforts. While considerable attention was placed on what the ‘ideal’ program would look like, Summit participants highlighted where existing realities and the need to make additional progress, in some cases where the underlying scientific basis for the level of control needed may still be uncertain, were both important considerations.

Many of the recommendations outlined below are already components of the national CWA water quality program to one degree or another, or have been proposed as elements in state programs. In many cases Summit participants highlighted that what was most needed was increased use of existing tools.

Though the Summit’s ground rules limited discussions to changes and actions that could be accomplished using current CWA authorities, Summit participants continually raised the issue that more comprehensive change, potentially to the CWA itself, is needed to fully embrace a holistic watershed-based approach in which all sources are equitably included and ensure the most effective solutions to impacts are implemented.

The first four recommendations listed below, Range of Control Approaches, Adaptive Implementation, Flexible Permit Expression, and Effective Incorporation of Costs and Benefits, were the focus of significant attention from Summit participants. Elements of these recommendations are new or different from the ‘current business as usual’ approaches, but NACWA believes they have significant promise in potentially breaking the current logjam on nutrient issues in many parts of the country. The remaining recommendations outline where additional work is needed to, for example, make better use of existing tools and develop more guidance and equitable control programs.

## 1) Range of Approaches for Establishing Criteria and Selection of Controls Must Be Available

Probably the most controversial issues surrounding nutrients are the establishment of appropriate CWA 304(a) criteria and the use of those criteria to select the control measure(s) that may be needed. During the Summit, participants discussed the need for ensuring that a range of criteria development and control approaches be available in light of the substantially different local conditions and needs.

To date, the point source community has largely insisted that EPA and the states establish a clear causal link between nutrient concentrations and water quality impacts before establishing a water quality criterion and before imposing control requirements. Summit participants discussed the reality that in some parts of the country, where point source contributions comprise a larger portion of the total nutrient load and where water quality conditions are obviously impacted by nutrient over-enrichment, action may be necessary despite uncertainty in the underlying scientific information regarding causal links.

Discussions addressed the situations in which each of these approaches below may be appropriate, but focused on the need for options. NACWA envisions that the point source community would work collaboratively with the states to determine what combination of these approaches may be appropriate for particular states and waterbodies.

Overall, three approaches were discussed:

- Use of special studies to develop site-specific criteria, considering the full suite of potential criteria expression options (beyond TP and TN). Necessary point source controls would be established based on reasonable potential determinations (for un-impaired waters) and based on total maximum daily load (TMDL) waste load allocations for impaired waters. While site-specific criteria development is resource-intensive, new, lower cost modeling and analysis tools are becoming more available to better enable this mechanistic approach. More specifically, mechanistic approaches such as modeling could serve to assess the “effect” of nutrients on certain end-points (e.g., seston algal densities, attached periphyton, dissolved oxygen levels, etc.). Dischargers, regulatory agencies, and other stakeholders would need to work together to agree upon a common set of end-points and target values that the site specific criteria (and associated nutrient reductions) would be designed to achieve. This site-specific approach would be most appropriate where the point source community is willing and able to make significant resource investments and ensure there is adequate data and information to support modeling and develop the site-specific criteria. The approach is also likely to be more effective where there is greater uncertainty regarding the contribution of point sources to impairment.
- A collaborative effort between the discharger community and the state to develop state-wide nutrient criteria using a scientifically-defensible approach<sup>1</sup>. Again, criteria developed through this approach should consider the full suite of criteria expression (i.e., beyond TP and TN concentration levels) and dischargers still need the option to develop site-specific

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<sup>1</sup> EPA generally refers to three approaches for developing nutrient criteria – stressor response, mechanistic modeling, and the reference condition approach. NACWA generally believes that the reference condition approach is not a scientifically defensible method for developing water quality criteria that adequately reflect the unique properties of nutrients and protect the full range of potential designated uses.

if they choose. This option could be appropriate when a site-specific approach is deemed too costly and where a significant point source contribution is better established. While it may be possible to establish a clear cause and effect relationship using this approach (e.g., for lakes), the level of uncertainty associated with the linkage between the criteria and the potential for water quality impacts using state-wide criteria will necessitate more flexible implementation provisions. *See Flexible Permit Expression* below. Recent efforts in Wisconsin, during which criteria were developed in tandem with flexible implementation procedures, illustrates how this type of approach can be successful.

- Use of technology-based effluent limits for point sources, as appropriate, considering local water quality conditions, relative source contributions and facility size. A reasonable level of technology-based control (e.g., biological nutrient removal to levels such as 8 mg/L TN and 1 mg/L TP) may be appropriate for some point sources – in waters where point sources are dominant contributors of nutrients and where nutrient levels are so high that controls will obviously be necessary. NACWA continues to believe that this is not a viable option nationwide, but something that could be considered at the state and watershed levels as either the framework for a nutrient control program or an interim step to be used as the state continues to develop water quality criteria. Summit participants indicated that the clean water community would need to be directly involved in the selection of any technology-based option. The approach currently employed by the State of Kansas is likely a good example for this type of nutrient control approach. The use of a technology based approach would not be appropriate in cases where dischargers are willing to invest and collaborate with regulatory agencies in the development of other options such as site-specific or state-wide criteria as previously described.

In many cases a hybrid of the above options would be appropriate. For example, in some states a technology-based approach is being explored for the near term while efforts continue to refine the science necessary to establish nutrient criteria. For all of these approaches, Summit participants recognized that impacts on downstream waters would need to be considered as well.

## **2) Goal Implementation Should Be Achieved Through Adaptive Management**

Where nutrients are contributing to water quality impacts, Summit participants identified the need for a true adaptive management approach to ensure that necessary control efforts are done in an economically efficient manner and to ensure that equitable controls are developed to address nutrient contributions from both point and nonpoint sources in a watershed. The State of Wisconsin included an adaptive management approach in recently adopted rules that could serve as a starting point for other adaptive management efforts.

Through adaptive management, collaboration between point and nonpoint sources is encouraged. Flexible approaches for meeting water quality criteria can be pursued, including water quality trading and offsets. Adaptive management demands longer implementation horizons, recognizing that it takes time to develop and implement a coordinated nutrient control strategy within a watershed, and for the resulting water quality benefits to be realized. This is particularly true where water quality trading or the purchase of offsets is part of the implementation strategy. Establishing interim water quality goals will ensure that adequate progress is being made to meet the final water quality criteria. This would need to be supported by water quality monitoring within the watershed and an evaluation process to monitor progress.



In general, with nutrient-related water quality impacts longer implementation horizons, potentially 15 to 20 years or more, are needed. EPA recognized this when it requested comment on a restoration standard concept in its recent proposal of numeric nutrient criteria for Florida. A single five year permit term for point sources is insufficient time to allow controls on nonpoint sources to be put in place and begin to work. Through the establishment of an adaptive management framework, with interim goals and accountability, progress will be assured while enabling the use of more cost effective approaches.

### **3) Flexible Permit Limit Expression Needed**

Expression of discharger permit limits for nutrient-related parameters should be flexible and recognize the unique characteristics of nutrient impacts that set them apart from other pollutants such as metals. Setting permit limits based on short-term periods such as weekly or monthly averages and establishing daily maximum limits is inappropriate for the vast majority of surface waters. Nutrient impacts are generally realized on a much larger time scale and use of annual averaging periods is appropriate when setting permit limits for many waters.

Beyond the averaging period, permit limits may also need to consider seasonal variability and be more dynamic than typical pollutant limits to better connect them to in-stream conditions like flow. There are also new, more innovative approaches to establishing permit limits for nutrients under consideration like the use of nutrient assimilation zones and load duration curves to better account for the behavior of nutrients once discharged. EPA should better explore these innovative approaches and ensure the states receive information and guidance on their use. NACWA's members are working on many of these new approaches and can provide additional information on how they may improve our current efforts to address nutrients.

### **4) Cost and Benefit Considerations Must Be Effectively Incorporated**

A top concern for utility managers at the Summit was the need to strike an appropriate balance between their commitment to protecting the environment and their commitment to provide cost-effective service to their ratepayers. Clean water agencies have been entrusted with the responsibility to spend their communities' limited resources in a manner that will provide the appropriate level of service, ensure compliance with all necessary regulations, and ultimately result in an improved environment. In this capacity, utilities have a responsibility to ensure the investments they make will actually improve water quality.

Establishing a clear causal link between nutrients being discharged from the wastewater treatment plant and designated uses and water quality is critical in demonstrating the need for a particular investment to ratepayers. Securing the necessary funding to install and operate nutrient controls in watersheds where point source reductions will have little or no measurable benefit will be difficult and in some communities impossible given the political realities of how rate increases or bond issuances are approved. While the current water quality-based programs of the CWA do not expressly include cost-benefit considerations, the implementation of water quality criteria, TMDLs, and the imposition of water quality-based effluent limits must acknowledge the importance of these cost-related challenges at the local level.

In addition to the importance of establishing a causal link when evaluating cost-benefit, the issue of how much treatment should be required of a point source must also be considered. While the CWA's water quality programs provide no off-ramp for point sources to avoid technology controls

at or beyond the limits of technology (including reverse osmosis), EPA's final rule establishing numeric nutrient criteria for Florida recognizes that implementation of such controls "has not been demonstrated as practical or necessary." This reflects the fact that forcing utilities beyond a certain level will cost much more than the benefits received and result in major increases in power consumption and greenhouse gas emissions. EPA's statements to the contrary, however, do not remove the potential CWA mandates (e.g., TMDL wasteload allocations) that could impose these excessive levels of control.

Consideration of cost-benefit, clear causal links, and the appropriate level of treatment are even more critical where point sources are the minimis contributors to nutrient impairment and where there is no program in place to ensure that equitable controls from all sources are imposed. As evidenced by EPA's proposed TMDL for the Chesapeake Bay, where controls on nonpoint sources are not in place, point sources will continue to bear the brunt of the responsibility for reducing nutrient loads, without regard to cost or benefit.

#### **5) Know Your Waters – Monitoring Programs Must Be Sufficiently Robust**

Summit participants felt that monitoring programs should be sufficiently robust to potentially support the development of site-specific criteria for nutrients and include information on biological, chemical and physical waterbody characteristics. Monitoring programs should be equipped to assess for biological impact as well as take stock of the full range of stressors that could influence the level of nutrient impairment (e.g., habitat loss, tree canopy, flow modifications). Ultimately these monitoring and assessment programs should be able to characterize any causal links between nutrient loads and water quality impacts.

Recognizing the limits of existing state budgets and the potential for cuts into the future, Summit participants highlighted the important leadership role that clean water agencies (and presumably other dischargers) would need to play to support this level of water quality monitoring. Where water quality programs are lacking, it was presumed that the clean water community would work to ensure that the appropriate data were collected or that the resources needed to conduct the monitoring were available to support defensible and responsible decision making.

#### **6) Uses of Waterbodies Must Be Evaluated**

Second only to monitoring, Summit participants felt that ensuring water quality efforts are working toward the correct endpoint is a top priority. Too often use attainability analyses (UAAs) are seen as efforts undertaken to downgrade a use. EPA has provided insufficient guidance on the appropriate use of UAAs and done little to address the stigma now associated with this important tool. Getting uses right is essential for ensuring that the CWA water quality-based programs are effective.

For nutrients, the question of designated use is even more critical because the link between nutrients and uses is often not clear. In many cases, all that is needed is simple refinement of an established use to more accurately reflect the different conditions that may support acceptable, desired uses and ensure that the goals of the CWA are met. For example, an aquatic life use that may otherwise seem unattainable may be refined to indicate that the actual goal is sustaining a warm-water fishery, which would add significant clarity to the level of protection that was necessary. EPA must do more to increase the refinement of uses and the utilization of UAAs.

Another important element of ensuring that management efforts are working toward the right targets is to conduct more thorough reviews of state water quality standards via the existing triennial review process.

### **7) Existing Tools Need Added Clarity and Improvement**

Summit participants agreed that many of the tools needed to better address nutrient issues and the complexity associated with implementation are already available. These tools include variances, compliances schedules, watershed-based permitting, and UAAs. However, EPA needs to do more to ensure these tools are more widely used and accepted and needs to provide additional clarity on when and how they can be used. New approaches, including the restoration standard concept contemplated by EPA in its proposal for Florida, may be needed, but more can be done with existing tools as well.

In exploring the use of these tools, NACWA believes that more thoughtful consideration should be given to defining the nature of any relief that may be needed for a set of local conditions. For example, is there a need for more time to meet an attainable limit? Is the limit one that cannot be met from a technological or economic impact standpoint or is the designated use unattainable? The State of Montana, for example, is exploring an approach to nutrient control that incorporates existing variance authorities, an evaluation of attainability, and an affordability component to determine how to impose controls on point sources.

The current TMDL program provides a powerful tool through which an adaptive management framework can be applied and the use of longer-term implementation timeframes, variances, watershed-based permitting, and other existing tools can be coordinated. NACWA believes that additional guidance from EPA on TMDLs would be helpful, especially in the area of establishing among watershed stakeholders the principles (including cost and equity) that will guide decision making.

### **8) Nonpoint Sources Must Participate in a Meaningful Fashion**

While Summit discussions did not address broader policy issues associated with potential changes to the CWA, significant focus was placed on the need for an equitable accountability framework to ensure that all sources of nutrients are considered and controlled accordingly. While authority is lacking at the federal level to directly control nonpoint source contributors, several states, including Wisconsin, have developed programs for addressing nonpoint sources that could serve as models for other state and national efforts. NACWA believes that the establishment of accountability frameworks at the state level must be a top priority. These frameworks would include a quantitative allocation process for all sources, performance standards (to enable progress monitoring), and implementation drivers (e.g., loss or redirection of funding for nonpoint source management to the extent possible under current law).

## **Other Important Considerations**

Beyond the recommendations above, Summit participants identified other considerations that will need to be factored into future efforts to address nutrient-related water quality impacts.

Though there is no established methodology for doing so, Summit participants recognized that efforts on nutrient control must consider near and far field impacts. Protection of downstream waters is a crucial issue and one that EPA is now aggressively pursuing with its work on downstream protection values in Florida. NACWA believes that more work is needed in this area. How potential downstream impacts are addressed, especially when local waters may not require nutrient controls, will need to be considered further. Ignoring the health of local biological systems and installing treatment to protect downstream, far-field impacts will be a major challenge for utility managers who must demonstrate to their ratepayers the benefits gained from their investments.

Summit participants also highlighted the importance of education and outreach as an element of future work on nutrient controls. Specifically, EPA, states and the discharger community must work to increase the level of awareness regarding the complexity of nutrient impacts and the flexibility currently available under the CWA to address them. In this context, Summit participants emphasized the need to conduct community and advocacy group outreach to develop a common understanding of nutrient challenges, state regulator outreach to raise awareness of existing CWA flexibility, and public outreach to inform about the relative importance, value, and budget requirements for nutrient management investments.

States play a key role in CWA implementation. Given the current limitations of the CWA's statutory reach, many see the states playing an even more integral role in efforts to address all sources of nutrients, including nonpoint sources. But states will no doubt face tremendous obstacles to addressing nutrient contributions from agriculture. Addressing interstate water issues, such as the hypoxia in the Gulf of Mexico, will further complicate a state-by-state approach. States will need to maintain or develop certain capacities to enable site-specific criteria development, the use of adaptive management approaches, and the increased use of existing CWA tools such as UAAs and variances. The clean water community will need to support and encourage states to invest in the tools and talent needed to enable this level of management and advocate for federal money to support states' capacity needs. The clean water community should also actively engage states in support of criteria development.

## Conclusions and Next Steps

NACWA understands that continued efforts are needed to address nutrient-related water quality impacts nationwide. NACWA's September 2010 Nutrient Summit was convened to explore new approaches to nutrient goal development, cite programs that are making real progress, and determine what the clean water community can do to improve the country's efforts to address nutrient impairments. NACWA strongly believes that reliance on criteria development and permit implementation approaches that are poorly linked to the ecological effects of nutrient pollution will result in major expenditures for point sources with possibly no or minimal improvement to water quality for many waters. How nutrient water quality impacts are assessed, criteria are set, and controls are implemented must ultimately result in water quality improvements, provide lasting benefits, and be affordable and sustainable.

At the same time, there is increasing interest in making progress in the interim, while additional data are collected to help resolve some of the uncertainty surrounding control efforts. Proceeding in the absence of a clear causal link, however, necessitates significant flexibility in implementation.

NACWA believes that a range of control approach options combined with better reliance on existing CWA tools will accelerate current efforts to address nutrient-related water quality impacts.

NACWA's Nutrient Summit was only the first step in what NACWA hopes will be an active and sustained dialogue among EPA, the states, and the clean water community on these issues. NACWA has already had preliminary discussions with both EPA and the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and plans to use this issue paper to guide these discussions going forward.