



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
GREAT LAKES NATIONAL PROGRAM OFFICE
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

20 MAY 2016

Mr. Don Zelazny
Coordinator
Great Lakes Program
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2915

Dear Mr. Zelazny: *Don*

Thank you for your May 9, 2016 request to remove the "Degradation of Phytoplankton and Zooplankton" Beneficial Use Impairment (BUI) at the Rochester Embayment Area of Concern (AOC), Rochester, New York. As you know, we share your desire to restore all of the Great Lakes AOCs and to formally delist them.

Based upon a review of your submittal and the supporting data, the U.S. Environmental Protection Agency hereby approves your BUI removal request at the Rochester Embayment AOC. In addition, EPA will notify the International Joint Commission of this significant positive environmental change at this AOC.

We congratulate you and your staff, as well as the many federal, state, and local partners who have worked so hard and been instrumental in achieving this important environmental improvement. This progress will benefit not only the people who live and work in the Rochester Embayment AOC but all the residents of New York and the Great Lakes basin as well.

We look forward to the continuation of this important and productive relationship with your agency and the local coordinating committee as we work together to delist this AOC in the years to come. If you have any further questions, please contact me at (312) 353-4891, or your staff may contact John Perrecone, at (312) 353-1149.

Sincerely,

Chris Korleski, Director
Great Lakes National Program Office

cc: Wade Silkworth, Monroe County
Charlie Knauf, RAC Chair
Josh Haugh, NYSDEC
Raj Bejankiwar, IJC
Frederick Luckey, US EPA, Region 2
Brenda Jones, US EPA, GLNPO

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Great Lakes Programs

270 Michigan Avenue, Buffalo, NY 14203-2915

P: (716) 851-7070 | F: (716) 851-7009

www.dec.ny.gov

May 9, 2016

Mr. Chris Korleski
Director
Great Lakes National Program Office
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

Dear Mr. Korleski:

I would like to request the U.S. Environmental Protection Agency's concurrence with the removal of the Rochester Embayment Area of Concern (AOC) Degradation of Phytoplankton and Zooplankton Populations Beneficial Use Impairment (BUI). The New York State Department of Environmental Conservation (NYSDEC) has determined that this impairment is no longer present in the Rochester Embayment AOC.

The enclosed BUI removal proposal describes NYSDEC's evaluation of the current status of the impairment, which is based upon a recent NYSDEC and USGS study. NYSDEC developed the removal proposal in accordance with the process contained in New York State's *Guidance for Delisting (Redesignation) of AOCs and their BUI Indicators*, which is consistent with the U.S. Policy Committee's *Delisting Principles and Guidelines* document.

The Rochester Embayment Remedial Advisory Committee fully supports the removal of this BUI. In addition, NYSDEC and the Monroe County Department of Public Health held a public meeting on removal of the BUI. The comments received were addressed as documented in the following document.

If you need further information, please contact either Mr. Joshua Haugh, NYSDEC State AOC Coordinator, at 518-402-8199 or Mr. Wade Silkworth, Monroe County Department of Public Health Rochester Embayment AOC Coordinator, at 585-753-5470. Thank you for your consideration of this request.

Sincerely,



Donald Zelazny
Great Lakes Programs Coordinator



NEW YORK
STATE OF
OPPORTUNITY

Department of
Environmental
Conservation

Enclosure

cc: Mr. John Perrecone, GLNPO
Mr. Seth Ausubel, USEPA Region 2
Mr. Frederick Luckey, USEPA Region 2
Ms. Brenda Jones, GLNPO
Mr. Joshua Haugh, NYSDEC
Mr. Wade Silkworth, MC Dept. Of Public Health

**Rochester Embayment
Remedial Action Plan
Beneficial Use Impairment (BUI) Indicator Removal Recommendation for the BUI:
Degradation of Phytoplankton and Zooplankton Populations**

- May 2016 -



Photo Credit Charles Knauf

New York State Department of Environmental Conservation
(AOC Coordination)

Rochester Embayment Remedial Advisory Committee
(Technical and Advisory Committee Members)

*This BUI indicator removal report was compiled by NYSDEC using all available information about plankton within the AOC and established research about the dynamics of plankton in riverine systems. One body of evidence used in this document is the report by Barry Baldigo, of US Geological Survey, titled “Toxicity of waters from the Rochester Embayment Area-of-Concern to the green algae *Selenastrum capricornutum* and the water flea *Ceriodaphnia dubia*”. This study was funded by the Great Lakes Restoration Initiative. AOC Coordination funding to NYSDEC is provided by the United States Environmental Protection Agency. The removal of this BUI indicator has involved government agencies, the Monroe County Department of Health, peers, professionals, and the public in review. All substantive comments have been incorporated into this BUI removal document. For information or copies please contact the lead RAP Coordinator in the Monroe County Department of Health in Rochester or NYSDEC Division of Water per the committee contact information in Appendix A.*

Table of Contents

I. Executive Summary

II. Background

- A. BUI Removal Criteria
- B. Endpoint
- C. BUI Removal Comment and Report Preparation

III. BUI Indicator Status Resolution

- A. Strategy, Rationale, and Results
- B. Supporting Data and Assessment
- C. Criteria, Principles, and Guidance Application
- D. Removal Statement

IV. BUI Redesignation (Removal) Steps and Follow-up

- A. BUI removal steps
- B. Post Removal Responsibilities

V. Appendix

- A. List of Remedial Advisory Committee members
- B. Public Meeting Notes and Responsiveness Summary
- C. References

List of Figures and Tables

Figure 1 – Map of the Rochester Embayment Area of Concern

Figure 2 – Map of the Rochester Embayment Area of Concern showing sampling locations

I. Executive Summary

This Beneficial Use Impairment (BUI) Removal Report identifies the background, criteria, supporting data, and rationale to redesignate the status of the “Degradation of Phytoplankton and Zooplankton Populations” BUI from “Impaired” to “Not Impaired” for the Rochester Embayment Area of Concern.

In the Stage I and Stage II Remedial Action Plans (RAPs) and subsequent Updates, the status of this BUI was listed as “impaired in the lower Genesee River and unknown in Lake Ontario” due to an absence of data in the Embayment but later modified to “impaired” for consistency across all AOCs nationwide. The delisting criteria for this BUI are that “AOC plankton bioassays confirm that toxicity in ambient waters (i.e., no growth inhibition) is not significantly higher than comparable non-AOC controls,” or “ambient water samples of AOC waters comparable to non-AOC control sites cause no toxicity to zooplankton and phytoplankton. ”

In 2013-2014, the NYS DEC and U.S. Geological Survey initiated a spatially and temporally intensive follow-up study to the 2011 SUNY Brockport study (Neuderfer and Haynes 2011) to assess the toxicity of waters of the Rochester Embayment AOC to phytoplankton and zooplankton (Baldigo et al., 2016). The results of this study demonstrated that the ambient waters of the AOC were generally no more toxic to the phytoplankton and zooplankton test species than were waters from upstream and downstream control sites outside of the AOC.

Following an evaluation of the results of this study and of other evidence gathered for this BUI as part of the removal process, the RAC has determined that the “Degradation of Phytoplankton and Zooplankton Populations” BUI has met the conditions for removal listed in the local removal criteria to the maximum extent practicable. The RAC fully supports the recommendation that the “Degradation of Phytoplankton and Zooplankton Populations” BUI for the Rochester Embayment AOC be removed from the list of impaired BUIs for the Rochester Embayment AOC.

II. Background

In the Great Lakes Basin, the International Joint Commission (IJC) has identified 43 Areas of Concern (AOCs) where pollution from past industrial production and waste disposal practices has created hazardous waste sites and contaminated sediments. Up to 14 Beneficial Use Impairments (BUIs) are used to evaluate the condition of an AOC. Restoration of each BUI must be documented in order for an AOC to be delisted. This Removal Report outlines the available data addressing the status of the “Degradation of Phytoplankton and Zooplankton Populations” BUI at the Rochester Embayment AOC and includes the recommendation of the RAC that the

status of this BUI be redesignated from “Impaired” to “Not Impaired” in the Rochester Embayment AOC,.

The Rochester Embayment AOC includes the lower portion of the Genesee River from the mouth up to the Lower Falls in Rochester and the portion of Lake Ontario within a straight line drawn from Bogus Point to Nine Mile Point.

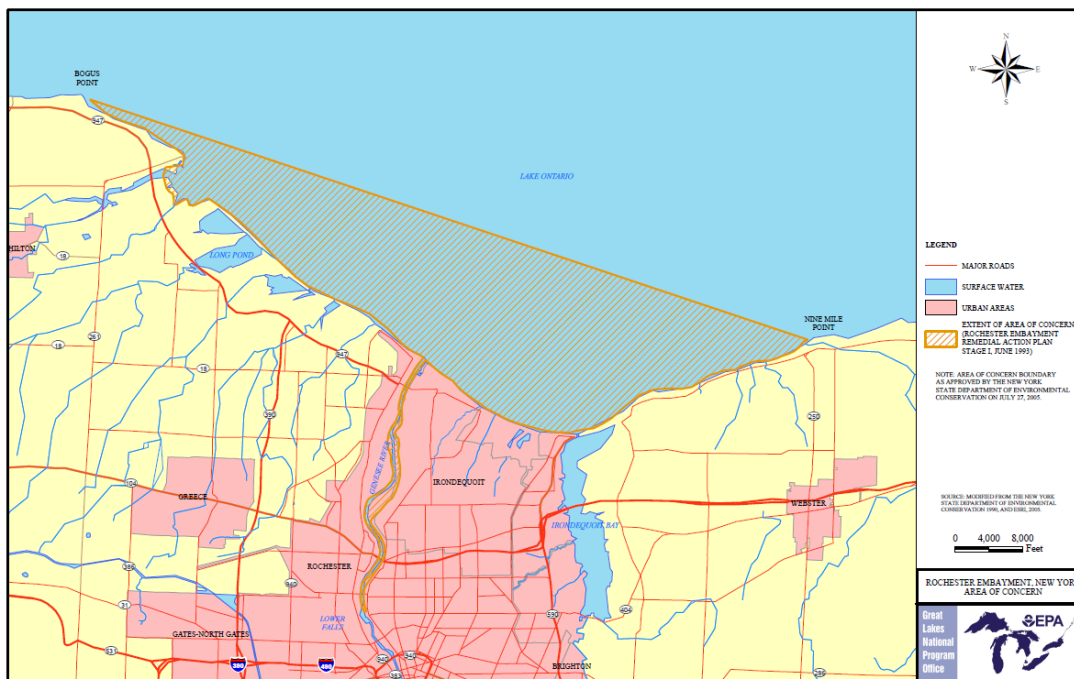


Figure 1. Map of the Rochester Embayment AOC.

A. Delisting Criteria

In accordance with the Rochester Embayment Remedial Action Plan Stage II updates (April 18, 2013) and the International Joint Commission Delisting Guidelines for Degradation Phytoplankton and Zooplankton Populations, this BUI may be removed when the following criteria have been met over the course of 12 months:

1. AOC plankton bioassays confirm that toxicity in ambient waters (i.e., no growth inhibition) is not significantly higher than comparable non-AOC controls.
OR
2. Ambient water samples of AOC waters comparable to non-AOC control sites cause no toxicity to zooplankton and phytoplankton.

These criteria were modified by the Rochester Embayment Remedial Action Committee (RAC) from the previous criteria which stated “90% of ambient water samples (collected monthly for

one year, compared to a control, cause no chronic toxicity to *Ceriodaphnia dubia*.” They were modified to account for potential non-AOC, watershed impacts such as turbidity and eutrophication that result from upstream nutrient delivery to the Genesee River. It also made the criterion attainable and alleviated the need to sample during adverse winter weather. This approach to BUI removal is consistent with the USEPA Delisting Guidance document (USPC 2001).

B. Endpoint

The desired endpoint for this BUI identified by the RAC in the 2013 AOC Management Meeting cites new plankton BUI criteria where the endpoint looks for waters of the AOC to be of similar condition to comparable areas outside the AOC (MCDOH, 2013). The achievement of this endpoint could be demonstrated by the use of bioassays to confirm the lack of toxicity of AOC waters to phytoplankton and zooplankton test organisms (indicating a lack of impairment of AOC phytoplankton and zooplankton communities).

C. BUI Redesignation Comments and Report Preparation

The following questions were asked when evaluating whether to proceed with the change in plankton status:

1. Are the methods and results cited in the report or presentation materials technically and scientifically sound?
2. Does the information cited in the report regarding restoration of the impaired beneficial use support the delisting criteria?
3. Does the RAC concur that the delisting criteria have been met?

The evaluation included conducting a thorough review of technical reports and supporting documents.

III. Indicator Status Resolution

A. Strategy and rationale

The United States Environmental Protection Agency (USEPA) Delisting Guidance document, Restoring United States Great Lakes Areas of Concern: Delisting Principles and Guidelines, adopted by the United States Policy Committee (USPC 2001) states the following:

“Re-designation of a BUI from impaired to unimpaired can occur if it can be demonstrated that:

- Approved delisting criteria for that BUI have been met;
- The impairment is not solely of local geographic extent, but is typical of upstream conditions OR conditions outside of the AOC boundaries on a regional scale. Such re-designation would be contingent upon evidence that sources within the AOC are controlled;
- The impairment is due to natural rather than human causes.”

The IJC delisting guidelines from 1991 state that this Beneficial Use may be deemed “Not Impaired” “When phytoplankton and zooplankton community structure does not significantly diverge from unimpacted control sites of comparable physical and chemical characteristics. Further, in the absence of community structure data, this use will be considered restored when phytoplankton and zooplankton bioassays confirm no significant toxicity in ambient waters” (IJC, 1991).

Phytoplankton and zooplankton populations are used as an indicator of aquatic ecosystem health because they are at the base of the food web and are sensitive to a variety of environmental stressors, including the presence of toxic substances in the water column (Munawar and Weisse, 1989).

This report presents information to show that the “Degradation of Phytoplankton and Zooplankton Populations” BUI for the Rochester Embayment AOC has met the conditions for removal based on present science. Based upon the evidence presented in this document, and the evaluation of this evidence through the Remedial Action Plan process, the RAC supports the redesignation of the “Degradation of Phytoplankton and Zooplankton Populations” BUI from “Impaired” to “Not Impaired,” thus removing this as an impairment to the Rochester AOC.

B. Supporting Data and Assessment

The Stage I (DEC 1993) Remedial Action Plan (RAP) identified this BUI as impaired in the Genesee River and unknown due to lack of data for phytoplankton and zooplankton assemblages in the Embayment portion of the AOC. The 1997 Stage II RAP (MCDOH, 1997) describes the need for a study to assess the status of this BUI in the Embayment portion of the AOC. The 2011 Stage I and II Addendum (MCDOH 2011) identifies the whole AOC as impaired and cites studies that address the Degradation of Phytoplankton and Zooplankton Populations for the AOC.

Although acute and chronic toxicity results cannot irrefutably prove that the lower trophic levels of natural lake and river ecosystems are fully intact and healthy, they control for variability in the plankton community driven by seasonality, temperature, daylight, river flow, upstream recruitment, and spatial fluctuations (Basu et al., 2000a; Basu et al., 2000b; Hudon, 2000). For this reason they serve as water quality surrogates across the country (USEPA, 2000a,b) and criteria for plankton BUI removal across the Great Lakes (George and Boyd, 2007).

In addition to statewide focused Rotating Integrated Basin Studies (RIBS) routine monitoring of a single site on the lower Genesee River, there are two primary and complementary pieces of literature that are pertinent to Rochester Embayment AOC plankton BUI. Both studies employed bioassays using the phytoplankton *Selenastrum capricornutum*¹ and the zooplankton *Ceriodaphnia dubia* (USEPA Test Methods 1003.0 and 1002.0, respectively). These bioassays expose the test organisms to ambient water samples and compare acute and chronic endpoints to test organisms exposed to laboratory controls or ambient reference samples (USEPA, 2002a; USEPA, 2002b). The *S. capricornutum* includes a four-replicate cell density (chronic) endpoint at the end of a four day exposure period. The *C. dubia* test involves a 10-replicate, seven day exposure period with survival (acute) and reproduction (chronic) endpoints.

These organisms were selected because:

- 1) they represent important links in the aquatic food chain,
- 2) they have short life cycles and are easy to culture in the lab,
- 3) they are sensitive to a wide range of contaminants (WDNR, 2004), and
- 4) for both species the USEPA has developed standardized toxicity tests (bioassays) to quantify biota responses to acute or chronic toxicity in freshwater environments (USEPA, 2002b). These USEPA bioassay protocols are used to estimate the toxicity of effluents and receiving (ambient) waters to freshwater organisms, and to identify effluents and receiving waters containing toxic materials in chronically or acutely toxic concentrations (USEPA, 2002a).

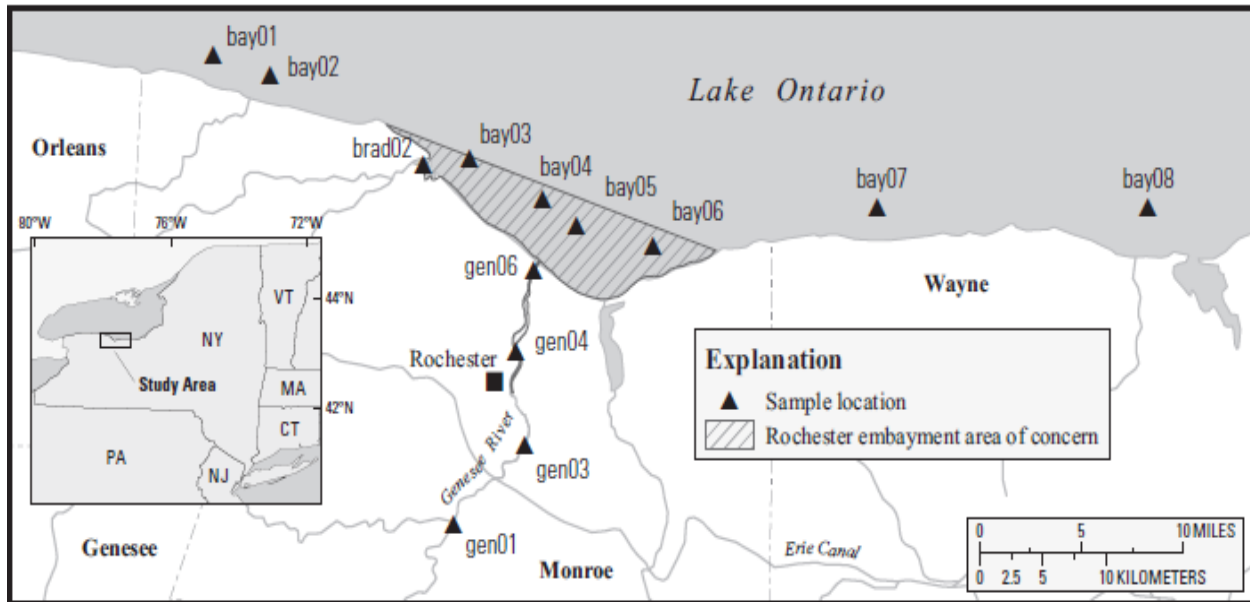
¹ The phytoplankton species previously known as *Selenastrum capricornutum* has been renamed *Pseudokirchneriella subcapitata*. For the purposes of this Redesignation document, we will use the name *S. capricornutum* to maintain consistency with Baldigo et al., 2012.

In 2011, a study was conducted by SUNY Brockport that began to address the impairment (Neuderfer and Haynes 2011). As indicated in Section A, delisting criteria were modified in early 2013 to better incorporate broader consideration for impacts from non-AOC specific impacts and contemporary water quality issues. The Brockport study was designed and carried out under plankton delisting criteria that stated when less than 10% of tests found significant differences in chronic toxicity between ambient samples and laboratory controls the BUI warranted removal. The Brockport study was followed in 2013-2014 by a joint US Geological Survey (USGS) and the NYS Department of Environmental Conservation (DEC) study that covered both a greater spatial and temporal extent (Baldigo et al. 2016).

In 2011, Nuederfer and Haynes (2011) sampled two sites in the embayment and one site on the Genesee River, all within the AOC, monthly over a period of nine months. Both phytoplankton (*Selenastrum capricornutum*) and zooplankton (*Ceriodaphnia dubia*) toxicity tests (USEPA Test Methods 1003.0 and 1002.0, respectively) were conducted on samples from the embayment while only zooplankton tests were conducted on Genesee River samples. The reason for this variation in study approach was because of an assumed adverse impact to the phytoplankton resulting from the turbidity levels of the Genesee River. Sampling points on the embayment were located approximately five kilometers east and west of the Genesee River mouth at approximately mid depth at 15 m deep sites. The Genesee River sampling point was located in the turning basin approximately three kilometers upstream from the mouth.

Using the standard EPA decision tree for the analysis of toxicity study results (USEPA 2002a, 2002b), significance of difference was determined between samples collected and respective laboratory controls. All three sampling locations had one of nine *C. dubia* tests with significant difference from the laboratory control. Combined results for *S. capricornutum* growth at both embayment sites were significantly lower in four of nine tests. Although the authors of this study recommended that the plankton BUI be delisted, it did not meet the 10% criteria described above. Additional questions also remained about the effect of turbidity on phytoplankton, the condition of the embayment as a whole, and to what extent any impacts observed originate outside the AOC.

The USGS/DEC study also used both *S. capricornutum* and *C. dubia* toxicity tests (USEPA Test Methods 1002.0 and 1003.0, respectively) and included 13 sites located within (test) or outside (reference) AOC boundaries, sampled seasonally (summer and fall 2013, spring 2014) across the Genesee River, Rochester Embayment, and Braddock Bay (Figure 2). It also evaluated two locations on the Genesee River (1 AOC, 1 reference) sampled monthly as area-wide surrogates to evaluate temporal variations in toxicity. An additional experimental study to assess the previously assumed adverse impacts of turbidity on both *C. dubia* and *S. capricornutum* was conducted (Baldigo et al. (2016)).



Base from *The National Map*, Universal Transverse Mercator projection, zone 18, WGS84, 1:1,000,000

Figure 2. Map of the Rochester Embayment AOC boundaries and sampling locations from the 2013-2014 USGS/DEC plankton toxicity assessment. (From Baldigo et al. (2016))

The experiment to determine turbidity impacts to acute and chronic plankton endpoints used centrifuged Genesee River water to dilute whole river test water through a series of dilutions (Baldigo et al. (2016)). No relationship (continuous or threshold response) was observed in the dilutions series nor were reductions observed in either *C. dubia* or *S. capricornutum* reproduction or survival (*C. dubia* only) dilutions compared to lab and river controls. The turbidity effect threshold was determined to be greater than 344 Nephelometric Turbidity Ratio Units, which was the turbidity of the Genesee River water used for the study. Therefore, turbidity should not have effect at levels lower than 344 (NTRUs).

For *C. dubia* survival, no significant differences were found between AOC and reference sites ($p=0.49$), months ($p=0.96$), or systems ($p=0.44$) (Lake Ontario vs. Genesee River). Reproduction in *C. dubia* did not differ significantly between monthly AOC and reference samples but did differ significantly between months ($p<0.0001$) (Figure 3). No significant difference was found between AOC and reference sites ($p=0.77$) or between systems ($p=0.99$) (Figure 4). Temporal changes in *C. dubia* reproduction (December, March-April) (Figure 3) were likely linked to decreased productivity of winter months. Seasonal differences in plankton reproduction and survival were also observed in the St. Lawrence River AOC (Baldigo et al. 2012). Warmer months bring larger amounts of particulate matter such as algae, bacteria, and detritus driving increased productivity beyond standard test feeding protocols (Schulze, 1999; Stewart and Konetsky, 1998).

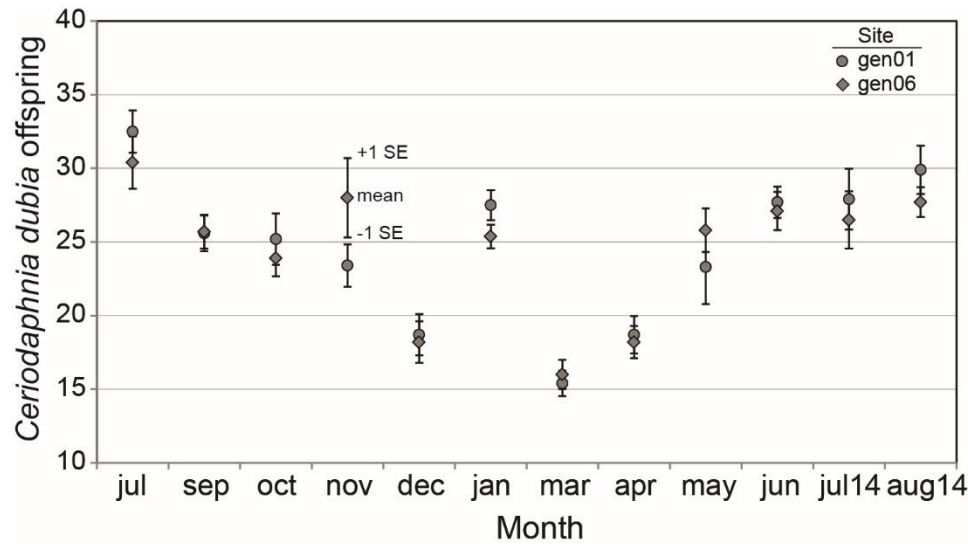


Figure 3. The mean and standard error for the number of offspring produced by *C. dubia* for monthly samples. Differed significantly between months ($p < 0.0001$ (from Baldigo et al. (2016)))

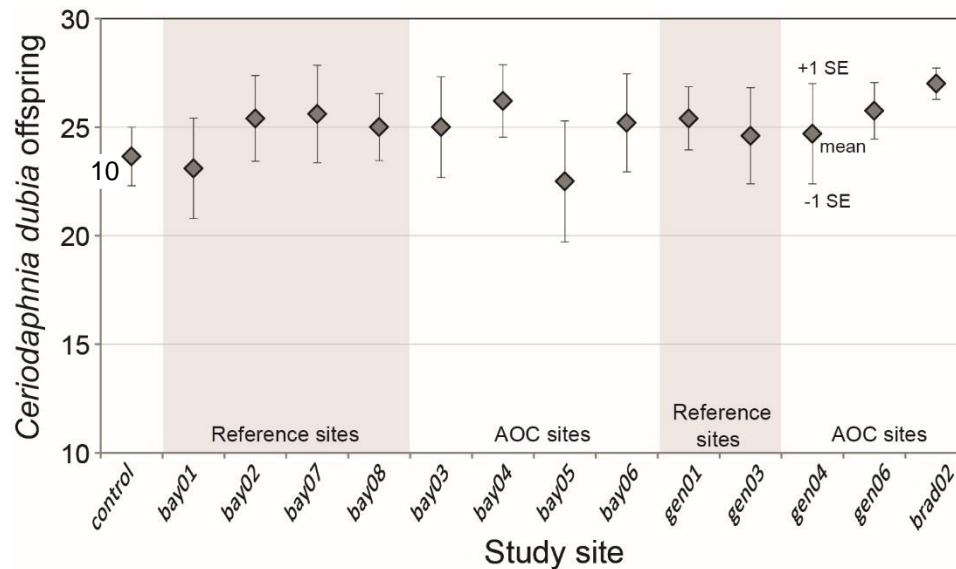


Figure 4. The mean and standard error for the number of offspring produced by *C. dubia* from all Rochester Embayment AOC and reference sites sampled three times, July and October of 2013 and May of 2014, and from gen01 and gen06 generally sampled monthly between July 2013 and August 2014. No significant difference was found between AOC and reference sites ($p = 0.77$) or between system ($p = 0.99$) (from Baldigo et al. (2016)))

Significant differences were found between cell density of *S. capricornutum* between systems ($p = 0.0002$) (Lake Ontario vs. Genesee River) and months ($p < 0.0001$) (Figures 5 and 6) but no significant differences were found between AOC and reference sites within the same system ($p = 0.1989$ and $p = 0.2259$ for river and embayment sites, respectively) (Figure 6). The Genesee

River had higher densities than the embayment and cell densities were generally slightly higher at most AOC sites compared to corresponding reference sites. It appears that nutrient concentrations or physical aspects of the river drove increased cell density of *S. capricornutum* compared to the embayment over the course of the study. The September AOC and reference samples taken on the river differed significantly but were higher in the AOC compared to reference. The results of the plankton bioassays in this study provide strong evidence that the water quality of the AOC should not adversely impact plankton communities to a greater extent than surrounding areas.

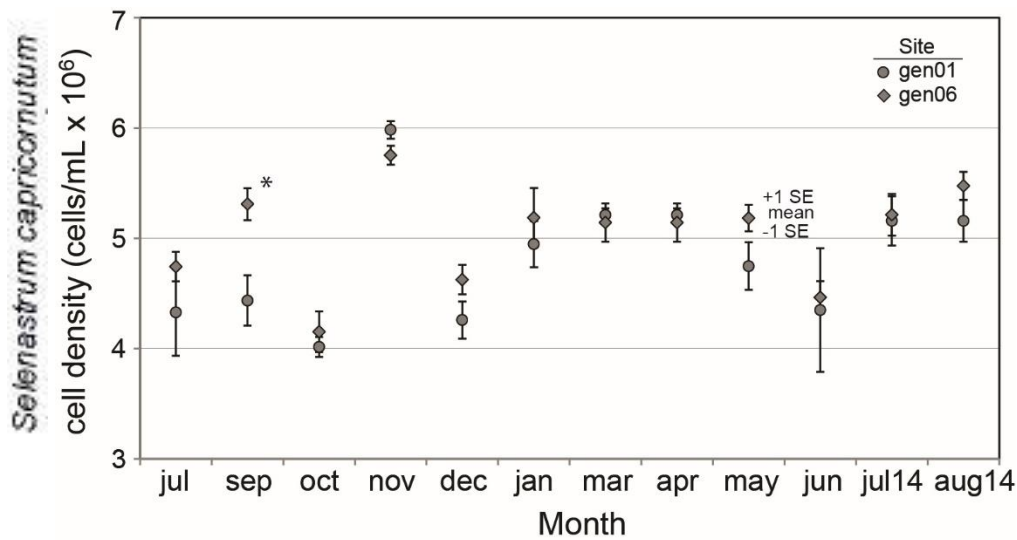


Figure 5. The mean density and standard error of *S. capricornutum* cells after exposure to waters from reference site gen01 and AOC site gen06 generally sampled monthly between July 2013 and August 2014. * indicates significant difference between AOC and reference sample. Significant differences were found between reproduction of *S. capricornutum* between months ($p < 0.0001$). (from Baldigo et al. (2016))

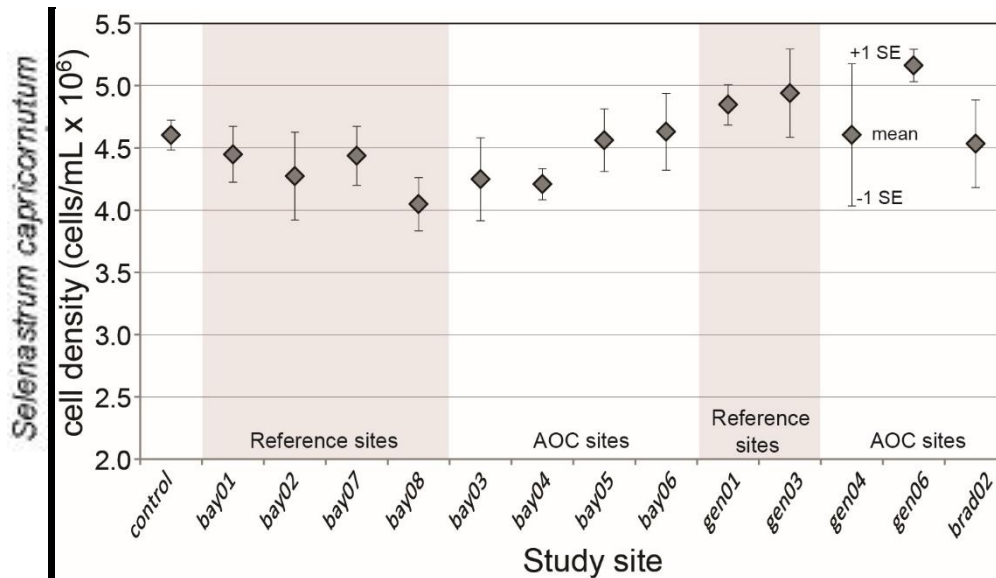


Figure 6 The mean cell density and standard error of *S. capricornutum* cells after exposure to waters from all Rochester Embayment AOC and reference sites sampled three times, July and October of 2013 and May of 2014, and from gen01 and gen06 generally sampled monthly between July 2013 and August 2014. Significant differences were found between reproduction of *S. capricornutum* between systems ($p=0.0002$) (Lake Ontario vs. Genesee River), but no significant differences were found between AOC and reference sites within the same system ($p=0.1989$ and $p=0.2259$ for river and embayment sites, respectively). (From Baldigo et al. (2016))

Lastly, as part of the Rotating Integrated Basin Studies (RIBS) statewide water quality monitoring program, NYSDEC conducts toxicity tests of the acute and chronic toxicity of ambient waters to the zooplankton *C. dubia*, by determining the effect of sampled waters on *C. dubia* survival and reproduction. This monitoring is conducted on a five-year rotating schedule of New York State watersheds, and samples were collected from three sites within the AOC in 2010. The Genesee River at the turning basin (gen04, Figure 2) has been sampled every five years. From 2000 on, no samples have shown significant difference in *C. dubia* survival or reproduction compared to laboratory controls (pers. comm. with Nikki Wright, NYSDEC).

The intent of the AOC remedial process is to bring the AOC to similar or better conditions than surrounding areas and by definition, Remedial Action Plans can only address impact sources within the AOC (USPC, 2001). Among other objectives, the Lake Ontario Lakewide Action Management Plan (LAMP) seeks to maintain and restore as necessary, diverse and self-sustaining biological communities by managing, monitoring and assessing critical pollutants, and lower and upper food web indicators (LaMP, 2008). The goals of the LAMP are in line with management of potential non-AOC sources of impact to the plankton populations in the Rochester Embayment AOC.

The results of the two AOC plankton BUI focused studies along with routine RIBS data on the Genesee River suggest that very little difference exists between waters of the AOC and surrounding areas. Results also suggest that seasonality and contemporary water quality issues such as nutrient input may drive plankton productivity. These toxicity test results demonstrate that the waters of the Rochester Embayment AOC are no more toxic to the phytoplankton and zooplankton test species than were waters from upstream and downstream control sites outside of the AOC. This lack of significant difference suggests that the “Degradation of Phytoplankton and Zooplankton Populations” BUI is Not Impaired at the Rochester Embayment AOC.

C. Criteria, Principles, and Guidance Application

The intent of the RAP process is to assess the status of each Beneficial Use Impairment; and, if existence of an impairment is indicated, to remedy the source of the impairment and subsequently demonstrate that the beneficial use has been restored. The delisting criteria for the “Degradation of Phytoplankton and Zooplankton Populations” BUI has been met in the following manner:

Toxicity bioassays using representative species provide a robust means of assessing the potential effects of AOC conditions on phytoplankton and zooplankton populations. The 2011 SUNY Brockport study, 2013-14 USGS/DEC study, and routine RIBS data demonstrate that waters of the Rochester Embayment AOC are no more toxic to phytoplankton and zooplankton test species than are waters from upstream and downstream control sites.

D. Redesignation Statement

The IJC delisting guidelines state that this Beneficial Use may be deemed Not Impaired “When phytoplankton and zooplankton community structure does not significantly diverge from unimpacted control sites of comparable physical and chemical characteristics. Further, in the absence of community structure data, this use will be considered restored when phytoplankton and zooplankton bioassays confirm no significant toxicity in ambient waters” (IJC, 1991).

The “Degradation of Phytoplankton and Zooplankton Populations” BUI was administratively listed as “unknown” due to a general absence of data for the embayment, rather than due to any technical evidence of impairment. The results of toxicity tests conducted by USGS and DEC in 2014, SUNY Brockport in 2010, and RIBS in 2000, 2005, and 2010 confirm that there is no significant toxicity to zooplankton and phytoplankton from ambient waters in the AOC. Based upon an evaluation these results, and on a lack of evidence to the contrary, the RAC has determined that the “Degradation of Phytoplankton and Zooplankton Populations” BUI has met the conditions for removal listed above to the maximum extent practicable. The RAC fully

supports the recommendation that the “Degradation of Phytoplankton and Zooplankton Populations” BUI for the Rochester Embayment AOC be redesignated from “Impaired” to “Not Impaired,” and thus removed as an impairment.

IV. BUI Redesignation Steps and Follow-up

A. BUI Redesignation Steps

| | <i>Completed</i> | <i>Date</i> | <i>Step Taken</i> |
|-----|------------------|-------------|--|
| 1. | √ | 12/2008 | Delisting criteria completed and finalized with USEPA |
| 2. | √ | 11/2011 | SUNY Brockport completes plankton toxicity study |
| 3. | √ | 4/2013 | RAC adopts new plankton criteria |
| 3. | √ | 5/2013 | USGS and DEC propose a more spatially and temporally intensive follow-up study |
| 4. | √ | 6/2013 | RAP advisory committee agreed to proceed forward with BUI delisting with the based on existing information and USGS plankton |
| 5. | √ | 12/2013 | Review of technical information assembled with USGS |
| 6. | √ | 1/2014 | Additional/ related monitoring, data review and assessment conducted |
| 7. | √ | 5/2015 | Discussion of redesignation by RAP advisory / oversight committee |
| 8. | √ | 5 /2015 | Collaboration with USEPA, DEC’s Toxicology Testing Unit, and other agencies for draft technical report preparation |
| 9. | √ | 11/2015 | Public meeting advertised and held, information, outreach, and comment on redesignation conducted (included a 30-day public comment period) |
| 10. | √ | 12/2015 | Comments assembled, Re-drafted BUI redesignation report prepared to include necessary changes |
| 11. | √ | 3/2016 | NYSDEC (in consultation with USEPA R2) completes final modifications to the Degradation of Phytoplankton and Zooplankton Populations BUI redesignation document. |
| 12. | √ | 5/2016 | Coordinate the formal transmittal of the BUI redesignation (delisting) with USEPA GLNPO. Communicate result with IJC. |
| 13. | √ | 5/2016 | Communicate results to local RAP Coordination for appropriate recognition and follow-up. |

B. Post-Redesignation Responsibilities

Following removal of the “Degradation of Phytoplankton and Zooplankton Populations BUI”, the organizations listed below will continue ongoing environmental programs to assure that the restored beneficial use is protected and continues to remain unimpaired. The environmental programs relating to this beneficial use are water quality monitoring, hazardous waste site remediation, and coordination of the Rochester Embayment Remedial Action Committee.

1. New York State Department of Environmental Conservation

Through the statewide Rotating Integrated Basin Studies (RIBS) ambient water quality monitoring program, NYSDEC will continue to monitor water quality in the AOC. The routine monitoring site on the Genesee River at the turning basin is sampled 5-6 times per year in spring, summer, and fall. The samples are analyzed for a wide range of potential contaminants and it includes toxicity bioassays using *C. dubia* every five years.

Through the State Pollutant Discharge Elimination System (SPDES), DEC will continue to regulate point source discharges of industrial and municipal wastewater and stormwater in accordance with the federal Clean Water Act. There are 6 permittees of point-source discharges in the AOC: Monroe County Shoremont Water Treatment Plant in Rochester, Rochester Gas and Electric Russel Station in Greece, Frank E Van Lare WWTF in Rochester, Kodak Park Treatment Facility in Rochester, Webster STP in Webster, and Northwest Quadrant Pure Waters WWTP. There are also several SPDES discharges upstream and outside the AOC on both Lake Ontario and the Genesee River.

2. United States Environmental Protection Agency

The USEPA will continue to provide funding for RAC Coordination and technical assistance to the extent that resources are available. The current GLRI grant supporting RAC coordination runs through September 2018.

3. Remedial Action Committee

The Remedial Action Committee will continue to forward the objectives of the Remedial Action Plan by evaluating, supporting, and documenting the restoration of the Rochester Embayment Area of Concern, until all of the Beneficial Use Impairments are restored and the long-term goal of delisting the AOC can be achieved.

V. Appendix

A. List of Remedial Advisory Committee members

Wade Silkworth
 Rochester Embayment Area of Concern
 Remedial Action Plan Coordinator
 wadesilkworth@monroecounty.gov
 585-753-5470

Monroe Co. Department of Public Health
 111 Westfall Road - Room 938
 Rochester, NY 14620

| Name | Organization | E-mail |
|----------------------|----------------------------------|-------------------------------------|
| Charlie Knauf | General Public (MCDPH retiree) | anniebl@frontiernet.net |
| Jayne Breschard | GFLRPC | jbreschard@gflrpc.org |
| Louis J DiVincenti | URMC | Louis_Divincenti@URMC.Rochester.edu |
| Dorraine C. Kirkmire | City of Rochester | Kirkmired@CityofRochester.Gov |
| Michael G. Parker | Charlotte Comm. Assoc. | manyhats2u@gmail.com |
| Wayne D. Howard | Solara Concepts | whoward@solaraconcepts.com |
| Jeff Wyatt | URMC | Jeff_Wyatt@URMC.Rochester.edu |
| Chris Fredette | Roch. Comm. for Scientific Info. | cfredette@rochester.rr.com |
| Charles Valeska | General Public | CHAZVAL46@YAHOO.COM |
| David Klein | The Nature Conservancy | dklein@tnc.org |
| George Thomas | CEI | gthomas@ceinfo.org |
| John Waud | RIT | jmwscl@rit.edu |
| Mark Gregor | City of Rochester | mgregor@cityofrochester.gov |
| Paul Flansburg | Great Lakes Comm., Sierra Club | pflansburg@hotmail.com |
| Paul Sawyko | Stormwater Coalition | psawyko@monroecounty.gov |
| Stevie Adams | The Nature Conservancy | sadams@tnc.org |
| June Summers | Gen. Valley Audubon Society | summers@frontiernet.net |
| Staff | | |
| Wade Silkworth | MCDPH | WadeSilkworth@monroecounty.gov |
| Peter Rightmyer | MCDPH | prightmyer@monroecounty.gov |
| Jennifer Dunn | NYSDEC | jennifer.dunn@dec.ny.gov |
| Joan Kennedy | NYSDEC | joan.kennedy@dec.ny.gov |
| Josh Haugh | NYSDEC | joshua.haugh@dec.ny.gov |

B. Public Meeting Notes and Responsiveness Summary

Rochester Embayment Public Meeting, November 17th, 2015 – Tainting of Fish & Wildlife, Loss of Fish & Wildlife Habitat, Degradation of Benthos, Degradation of Plankton

The New York State Department of Environmental Conservation and the Monroe County Department of Public Health hosted a public meeting on the status of Rochester Embayment Beneficial Use Impairments at 7 p.m. on November 17, 2015 at the Roger Robach Community Center, 180 Beach Avenue. Notification of this meeting was distributed to local government officials, local media, and local environmental advocacy groups. Postcards were mailed to 600+ local resident addresses. Approximately 50 people attended. Pamphlets about the Area of Concern and its Beneficial Use Impairments were distributed and posters on each Beneficial Use Impairment were displayed and staffed by State and County experts. Comments were overall positive and the few questions formally posed were answered.

Commenter 1 – Was this meeting published in any of the local newspapers?

Response – Yes, several local papers including The New York Daily Record

Commenter 2 – There is white crust by furnaceville seen from middle falls dam. Response – it is Hematite and limestone

Commenter 3 – The phytoplankton delisting report is done well

Commenter 4 – It is interesting to see what things are improving but there is still a lot more to be done

Response – There are other programs that will continue to address environmental concerns in the future

Commenter 4- 14468 – Great presentations. Really liked the small group presentations. Thank you!!

Commenter 5 – The information presented was very helpful. The representatives were very knowledgeable and enthusiastic about their presents. A brief group overview followed by the individual poster sessions.

C. References

- Baldigo, B.P., Duffy, B.T., Nally, C.J., David, A.M. 2012. "Toxicity of waters from the Rochester Embayment Area-of-Concern to the plankton species *Selenastrum capricornutum* and *Ceriodaphnia dubia*" *Journal of Great Lakes Research* 42:464-471
- Basu, B.K., J. Kalff, and B. Pinel-Alloul. 2000a. The influence of macrophyte beds on plankton communities and their export from fluvial lakes in the St. Lawrence River. *Freshwat. Biol.* 45:373-382.
- Basu, B.K., J. Kalff, and B. Pinel-Alloul. 2000b. Midsummer plankton development along a large temperate river: the St. Lawrence River. *Can. J. Fish. Aquat. Sci.* 57:7-15.
- George, T.K., Boyd, D., 2007. Limitations on the development of quantitative monitoring plans to track the progress of beneficial use impairment restoration at Great Lakes Areas of Concern. *J. Great Lakes Res.* 33, 686-692.
- Hudon, C. 2000. Phytoplankton assemblages in the St. Lawrence River, downstream of its confluence with the Ottawa River, Quebec, Canada. *Can. J. Fish. Aquat. Sci.* 57:16-30.
- International Joint Commission (IJC). 1991. Proposed listing/delisting guidelines for Great Lakes Areas of Concern. Focus on International Joint Commission Activities. Volume 14, Issue 1, Insert. 1991.
- Lake Ontario Lake Management Plan (LaMP). April 2008. 130 p.
- Monroe County Department of Health (MCDOH). April 18, 2013. Survey of Status of New York Area of Concern Remedial Action Plan Activities: AOC Management Meeting, April 18, 2013.
- Monroe County Department of Health (MCDOH). September, 1997. Rochester Embayment Remedial Action Plan Stage II.
- Neuderfer, G.N., and J.M. Haynes. 2011. Determination of Whether an Impairment Exists for the Degradation of Phytoplankton and Zooplankton Beneficial Use Impairment in the Rochester Embayment Area of Concern, November 22, 2011.
- NYSDEC. September 2014. NYS Section 303(d) List of Impaired/TMDL Waters. 45 p. http://www.dec.ny.gov/docs/water_pdf/303dlistfinal2014.pdf
- Schulze, P.E. 1999. Measures of Environmental Performance and Ecosystem Condition. Schulze, P.C., editor. Washington, DC: National Academy Press; 312 p.
- Stewart, A.J. Konetsky, 1998. B.K. Longevity and reproduction of *Ceriodaphnia dubia* in receiving waters. *Environ Toxicology and Chemistry.* 17(6):1165-71. doi: 10.1002/etc.5620170625.

USEPA, 2010. “A Compendium of Delisting Targets for Beneficial Use Impairments in the US Great Lakes Areas of Concern”. Prepared for the USEPA Great Lakes National Program Office by the Great Lakes Commission, September 2010. Contact: Matt Doss, Great Lakes Commission, mdoss@glc.org.

USEPA, 2002a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and marine Organisms, Fifth Edition. US Environmental Protection Agency, Office of Water, Washington DC.

USEPA, 2002b. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. US Environmental Protection Agency, Office of Water, Washington DC.

USPC. 2001. Restoring United States Areas of Concern: Delisting Principles and Guidelines. Adopted by the US Policy Committee on December 6, 2001.

Wisconsin Department of Natural Resources, 2004. Stat of Wisconsin Aquatic Life Toxicity Testing Methods Manual, 2nd Edition. Wisconsin Department of Natural Resources, Madison, WI.