

NCCA 2015 Letter Peer Review Comments and Responses				
Peer Review Question	Peer Review Report Page	Reviewer	Comment	Response
I. General Impression		Scavia	If the Summary Report was only intended for the general public, the level of explanation and coverage is probably ok. But, in several places, the report claims to be useful to water resource managers and environmental policy makers. there needs to be more information brought in from the Technical Report	To address this comment, EPA added additional technical information to the report including, but not limited to, Appendix A describing sampling locations and Appendix B describing benchmarks.
I. General Impression		Scavia	I appreciate that these differ among the various indexes and indicators but including some graphics or tables (or at least an example like Table 5.7 in the Technical Report) would be helpful. It could even be an appendix to the Summary Report because, while it's all in the TSD, it would be good to have a sense that it is justified. Otherwise, it feels like "some folks got together and decided	To address this comment, EPA added additional technical information to the report including, but not limited to, Appendix A describing sampling locations and Appendix B describing benchmarks.
I. General Impression		Scavia	I am concerned about the "not assessed" category. For example, it was not clear until I looked at charts in more detail that, "50% good" meant 50% of all areas, not 50% of assessed area. It seems to me that 50% of all areas can be misleading, especially when comparing scores over times when the % area assessed changed	To address this comment, EPA included additional information on why there is unassessed area in the results.
I. General Impression		Scavia	The reader is given no sense of the actual extent or distribution of sample sites. Again, for the public that is probably ok. But for others, it is unknown if there was one sample taken in the Chesapeake Bay or in Lake Erie or 100s?	To address this comment, EPA added Appendix A, which describes sampling locations, to the report.
I. General Impression		Scavia	then I wonder if the eutrophication indicators really have any meaning. Unlike sediment and fish that integrate over time, the water quality parameters are highly dynamic seasonally. How can one sample per year capture eutrophication? This is also true for the toxic algae measures.	EPA revised information in Chapter 2 to address this comment including adding Table 2.1.
I. General Impression		Scavia	It is not clear why, for example, an entire page is allocated to ELISA, yet virtually nothing on other measures. If "good, fair, poor" indicator definitions were to be included, as I suggest above, the full-page on ELISA can be eliminated to make room	EPA agrees and removed the ELISA highlight.
I. General Impression		Scavia	It was also not clear why the Lake Erie Eutrophication Cause/Effect was singled out .	EPA revised the Lake Erie segment to focus on the intensification that conducted in summer 2015.
I. General Impression		Scavia	These comparisons were interesting, but I think they might be more informative if appropriate results from other NARS programs were added to the graphics instead of just included in the paragraphs	EPA appreciates the comment and will consider approaches for presenting results from across the surveys in future efforts.
I. General Impression		Scavia	This is not a big deal (and maybe it's necessary) but much of the language is repeated over and over. Perhaps there is some way to consolidate some of it to make room for some more of the background information I mentioned above	EPA appreciates the comment but chose to leave some repetition for those people who may read only specific sections of the report.
I. General Impression		Twiss	Overall, the NCCA 2015 Report provides a sound analysis of the observations used to assess coastal conditions, synthesizes the data into readily communicated information for summary, and it states conclusions that follow from the data presented. The information is presented at the scientific literacy level of an interested stakeholder or environmental manager at both national and regional scales. Caveats in the data analysis are noted and explanations are provided when these are stated. The power in the NCCA program is the adherence to standardized protocols using scientifically defensible techniques for sample site selection, sampling, and data analysis, that is providing a sound long-term coastal ecosystem assessment.	EPA appreciates the comment.
I. General Impression		Twiss	A) Greater scientific literacy can be assumed in a reader of the NCCA Report. For example, the use of specific terms like 'cyanobacteria' rather than using 'algae' as a colloquial term to include algae (eukaryotic protists) and cyanobacteria (prokaryotes) is useful, as noted in the specific comments (see Section III).	EPA appreciates the comment and revised the report to use technical terms with plain language definitions where appropriate.
I. General Impression		Twiss	B) The NCCA should be quantified as summer-specific assessment. With climate change occurring, winter is the season that is changing the most and may perhaps show the greatest response to stressors such as eutrophication and contaminants .	EPA revised text in Chapter 1 to clarify the results are based on a summer index period.
I. General Impression		Twiss	There are specific requests (see Section III, below) for increased clarity in the presentation of some figures. For example, the presentation of individual Great Lakes is clear, although order of Great Lakes as presented misses the opportunity to provide an additional gradient of elevation. The hydraulic residence time of the Great Lakes system is approximately 600 years (Quinn 1992) and a gradient of increasing water salinity from Lake Superior down to Lake Ontario exists and also a cumulative impact gradient as the watersheds of each lake are progressively more populated.	EPA agrees and revised the order that the Great Lakes are presented in graphics.
I. General Impression		Twiss	. D) Finally, the Great Lakes are an enormous freshwater system. As noted in Section II.9, there is a incorporate the connecting waters in this system, which are recognized by treaty by the United States to be integral components of the Great Lakes (Boundary Waters Treaty, 1909) and are defined by the NCCA as nearshore waters.	EPA appreciates the comment. EPA's Office of Research and Development and Great Lakes National Program Office will be releasing a separate report on the Great Lakes with information on the connecting channels.
I. General Impression		Nemazie	The National Coastal Condition Assessment 2015 is written for a broad audience. Most scientific terms are defined in a simple manner that most individuals with a high school education should be able to read. Policy makers would be able to pick up the general essence of the coastal conditions at a national and regional scale. The Report is organized very well and the authors maintained an easy format throughout that made it simple to follow along.	EPA appreciates the comment.

I. General Impression		Nemazie	The graphs showing the data were easy to understand. The use of “call-out” boxes associated with the graphs was most helpful. The comparisons to earlier NCCA data-sets were helpful and easy to interpret. The use of percentages of samples associated “good,” “fair,” and “poor” conditions were also easy to understand.	EPA appreciates the comment.
I. General Impression		Nemazie	However, the conditions “good,” “fair,” and “poor” we never defined within this document. I recognize that the conditions are defined based on the specific indicators within the technical document. I believe general definitions would help the reader have a clear picture of what good, fair, and poor mean in the context of the Report. Without definitions the reader may make up their own sense of what it means. The reader may get frustrated by the simple questions of what does “good” really mean? If the water is “poor” does it mean it is dangerous to human health?? I recommend that a box simply defining “good,” “fair,” and “poor” in context of: 1) ecological condition; 2) human uses such fishing, swimming, and recreating would be appropriate for this audience.	To address this comment, EPA added Appendix B, which describes benchmarks, to the report. The Technical Support Document contains additional details.
I. General Impression		Nemazie	The photos, tables, and other graphics were generally appropriate. However, I’ve noted some specific recommendation for changes to consider below. Highlighted boxes (often with a green background) offered useful additional information without overburdening the reader.	EPA appreciates this comment.
I. General Impression		Hickie	Overall, this is a well organized and highly informative report with clearly defined objectives that are then presented clearly and effectively, and in a manner that is well suited to a general audience with a modest level of scientific knowledge and an interest in the state of the environment. This is achieved by clearly written text that finds a good balance in describing the underlying science while avoiding unnecessary jargon and detail (for the most part), and distilling the results into a set of readily understandable indices that are then effectively interpreted in brief sections of text.	EPA appreciates the comment.
I. General Impression		Hickie	The figures used to present the results are clear and easy to interpret for most reasonably well-informed readers, and supporting text and examples should aid readers that are less familiar with the presentation of scientific results.	EPA appreciates the comment.
I. General Impression		Hickie	The conclusions presented in the report were well balanced and openly discussed some of the challenges that such a large-scale study presents when trying to interpret result namely the problems with the high incidence of areas that were unassessed due to difficulties in collecting samples in some areas.	EPA appreciates the comment.
I. General Impression		Hickie	As this is only the second NCCA report, the true value of the program will only be realized in future years when the temporal changes in these indices can be examined over several decades, and I look forward to seeing them. The value will be enhanced further as methods are refined based on experience in running such a large sampling program and by adding new measures as are noted in the final section of the report.	EPA appreciates the comment.
I. General Impression		Hickie	As a scientist reading this document, I naturally found instances where I wanted more details in the report, and thus had to remind myself that a person like me is not the primary audience. Despite this, some of my comments may reflect my desire for more details than are needed for a general audience. The Technical Support Document was also well crafted, although I did find a few elements in Chapter 7 that should be revised for clarity, transparency, and may warrant some revision in the future.	EPA appreciates the comment.
II.1		Scavia	Yes, it has in general, but I have concerns about the “environmental policymaker” audience. This is addressed in the I. I. General Impression.	To address this issue, EPA added additional technical information to the report and in appendices.
II.1		Twiss	Yes. People who have a stake in water resources nationally or on a local scale will be able to understand the language used in this report and the way in which results are presented. The approach that the NCCA takes is very well described. The scale is understood and the design of the sampling is well presented and repeated several times throughout the document so that the average lay person or environmental manager would be able to understand the goals, purpose, and design of this ongoing assessment exercise.	EPA appreciates the comment.
II.1		Nemazie	The NCCA 2015 Report does an excellent job at explaining goals, purpose, and design of the study. Although perhaps difficult to do, there may be some value to explain how past NCCA reports have been used to help impact policies, regulations, or “behavior” particularly related to implementation of best management practices.	EPA added additional information to the “How are the Report and Underlying Data Used?” section to address this comment.
II.1		Hickie	Yes, I believe the report does a good job of describing the goals and purpose of the report. The design of the study is more difficult to describe for a document like this where technical details cannot be allowed to bog down the presentation and make it more difficult to read. I have identified a few places where modest additions to the description of the design may help in the table below.	EPA appreciates the comment.
II.1.a		Hickie	Yes, I believe that is quite clear. It may be worth mentioning specifically that the design was not aimed at identifying or sampling known “hotspots” or “areas of concern” which are dealt with in other programs.	EPA added text to the report to clarify.
II.1.b		Scavia	Yes, this has been made clear in several places.	EPA appreciates the comment.
II.1.b		Twiss	Yes, the maps and text delineate the scale of the various contiguous US coastlines that are part of the sampling design. However, it would be additionally useful to state in the title and executive summary that the estuaries do not include those in Alaska or any other US territory – this is not discovered by a reader until page 13 of the pdf. The design is adequately stated so that the conclusions should be readily interpreted on the basis of each Great Lake’s nearshore zone (or the Great Lakes collectively) and the estuaries of large coastal regions on the East, Gulf, and West coasts.	EPA agrees and added information to Executive Summary and Chapter 1 to clarify the areas included.
II.1.b		Nemazie	Yes, it is very clear that site specific data are not available and that the data are aggregated into regions.	EPA appreciates the comment but notes that data for specific sites are available. The survey is designed to assess the population of waters not individual sites, however. No change required.

II.1.c		Scavia	The use of bar graphs, with numeric annotation is good. The use of error lines on the graphs are also good. I worry that the information on unassessed areas might be confusing. This is addressed in the I. I. General Impression section	To address this comment, EPA included additional information on why there is unassessed area in the results.
II.1.c		Twiss	The results are mostly presented in a clear and intuitive manner. I appreciated the effort to synthesize the data down to provide as simple a presentation of the data as possible while still maintaining enough spatial and temporal (when possible) detail. In several instances, the data could be presented more intuitively. For example, Figure 4.8.3 is not at all intuitive (see comment in Section III). Also, in Chapter 4, the order of the Great Lakes is presented in a non-intuitive manner (neither by size, area, nor even alphabetically). It would be best to list them in order of elevation, which indicates direction of water flow (see Section III for specific details).	EPA agrees. EPA revised the order that the Great Lakes are presented in graphics and removed graphic 4.8.3.
II.1.c		Hickie	Yes, the results are presented in a clear and very effective manner in the main body of the report. The graphics are quite easy to understand and the explanatory graphics and text on page 19 is very helpful for a lay audience. <i>One additional graphic that could be considered would be maps (similar to those on page 18) that show the good fair and poor areas along the coast lines in different colours. A caveat to this is that it may encourage readers to start interpreting them in site-specific terms which is not desired.</i>	EPA appreciates the comment and did not add the recommended maps for reasons stated by the reviewer.
II.2		Twiss	Yes, the “National Coastal Condition Assessment 2015” report is essentially an extended summary of the more extensive Technical Support Document. A document of this length provides a good overview and allows trends in coastline condition (where available) to be conveyed.	EPA appreciates the comment.
II.2		Nemazie	I found that it was barely mentioned that this “National Report” was only related to the 48 contiguous states and left off a mention of Alaska and Hawaii. I believe referring to other assessment reports focused on Alaska and Hawaii would serve the reader well. Therefore, I thought it may be more useful to have a separate report for the Great Lakes, even if the data were collected within the same time-frame. While there may be some redundancies it may be easier for the reader to handle the vast difference between these ecosystems as well as some of the indicators.	EPA appreciates the comment and revised the text to clarify that Alaska and Hawaii are not included. EPA will consider whether to develop completely separate reports for the Great Lakes and estuarine waters for the future.
II.2		Hickie	Yes it is. This document is an excellent entry point for a broad audience. People interested in more detail can then follow the links. I use documents like this when teaching introductory environmental science at my university and can often use data from associated websites or databases to develop assignments – they are very effective teaching aids.	EPA appreciates the comment.
II.2.a		Scavia	This seems like a rational compromise between national and regional reporting. But, when I downloaded a subset of the data, it was pretty hard to understand without metadata. For example, the column headings were undecipherable. This may not be important for the general public, but I imagine managers and policymakers, or their staff, would need it	EPA added metadata for the dashboard files.
II.2.a		Scavia	Not at this time.	No response required.
II.2.b		Nemazie	The Report did mention using several new indicators such as microplastics and nitrogen isotopes in sediment. Assessments of “trash” may also be a good indicator to consider in the future which may be simplified if the video sampling analysis becomes more broadly understood and incorporated. However, I believe a few indicators can be removed – particularly the ones that do not show any significant variations in results in the entire country or region (microcystins, enterococci, and PFOS*. The ephemeral nature of microcystins and enterococci may make interpreting their lack of finding within the environment much more likely due to the lack of time-series sampling. Because microcystins were never rated anything lower than “good”, I recommend that the methodology of measuring microcystins should be removed in its entirety (delete page 30) . For example, the PFAS call-out box seems to be an appropriate size for this new indicator.	EPA agrees and removed the ELISA highlight.
II.2.b		Nemazie	*As the understanding of the PFAS class of chemicals becomes better understood , as well as its sampling and analytical methodologies, this indicator may be worth keeping either for PFOS and/or other members of the PFAS family. I know there has been some sampling of fish tissue estuarine waters. If standard methods for collection and measuring advance, it may be worthwhile expanding this indicator throughout the nation – at least 1 time. If the results remain “within acceptable limits” for >90% of the samples, then I would recommend dropping it entirely.	EPA appreciates the comment and will consider ways that PFAS studies can be expanded as appropriate.
II.2.b		Hickie	No comment	No response required.
II.3		Scavia	These are described and represented clearly, but see I. I. General Impression on my concerns about ‘good, fair, poor’ indicators.	To address this comment EPA added Appendix B, which describes benchmarks, to the report.
II.3		Twiss	The use of past data to support the M-AMBI (multivariate Marine Biotic Index developed by the AZTI-Spain) approach to assessing benthic habitat condition is appropriate since the data were collected in previous coastline surveys in a consistent manner and the M-AMBI can be applied retrospectively, as stated in the report.	EPA appreciates the comment.
II.3		Nemazie	I’m not an expert in these techniques but I found their explanation to be simple and accurate. The use of biological indicators has been used for decades and is very important to integrator. I am glad to see progress being made in those biological indicators, presumably using collection techniques and species that better reflect today’s understanding.	EPA appreciates the comment.
II.3		Hickie	No comment	No response required.
II.3.b		Scavia	These are described and represented clearly, but see I. I. General Impression on my concerns about ‘good, fair, poor’ indicators.	To address this comment EPA added Appendix B, which describes benchmarks, to the report.

II.3.b		Twiss	Yes, the benthic Oligochaete Trophic Index (B-OTI) is appropriately applied. Use of oligochaete trophic indices is a well-established approach to evaluating eutrophic conditions that was developed over four decades ago (Howmiller & Scott 1977; Lauritsen et al. 1985; Milbrink 1983). Yes, the data are presented clearly. Since there is a rich data base (dating back to 2010) this strengthens the temporal trend analysis. Also, the caveats regarding the use of the B-OTI (Chapter 4.1) is well described so a reader can judge the confidence in the findings.	EPA appreciates the comment.
II.3.b		Nemazie	I'm not an expert in these techniques but I found their explanation to be simple and accurate. The use of biological indicators has been used for decades and is very important to integrator. I am glad to see progress being made in those biological indicators, presumably using collection techniques and species that better reflect today's understanding.	EPA appreciates the comment.
II.3.b		Hickie	No comment	No response required.
II.4		Scavia	These are described and represented clearly, but see I. I. General Impression on my concerns about 'good, fair, poor' indicators.	To address this comment EPA added Appendix B, which describes benchmarks, to the report.
II.4		Twiss	Yes, the Sediment Quality Index is applied appropriately and the presentation is understandable. The index includes benchmarks regarding toxicity, which are of ultimate interest and by using exposure-based assays the NCCA is able to assess toxicity of contaminants (specific and interactive effects), including those that are unknown or have unknown interactions (synergistic, additive, competitive). As designed, the approach will provide a reasonable impression of the nation's coastal waters at national and broad regional scales, and trends over time.	EPA appreciates the comment.
II.4		Nemazie	I'm not an expert in sediment assessments but based on my limited experience, the Sediment Quality Index is being used appropriately. It was well explained and understandable to a general audience. The trends over time are appropriate and simple to understand.	EPA appreciates the comment.
II.4		Hickie	No comment	No response required.
II.5		Scavia	These are described and represented clearly, but see I. I. General Impression on my concerns about 'good, fair, poor' indicators. I am also concerned about the sampling design for water quality measures. It appears that the stations are sampled only once (with some resampling for statistical purposes). I find it hard to believe that the real nature of the regions' eutrophication status can be captured this way. These measure vary dramatically over the season	EPA revised information in Chapter 2 of the report to address this comment including adding Table 2.1 and added Appendix B, which describes benchmarks.
II.5		Twiss	This is a topic in which I have the greatest amount of expertise to share. In brief, yes, the eutrophication index (based on nutrient concentrations [total nitrogen, total phosphorus], total chlorophyll-a, dissolved oxygen concentrations, and water clarity) is an appropriate means by which to measure the range of trophic status in estuarine and Great Lakes nearshore waters and it is well explained in the report. With respect to the ability to measure trends over time, the approach used by the NCCA is appropriate for five-year intervals for conditions measured during summer (the field season). However, it is important to note in the report that sampling is just during the summer. Therefore, the assessment of the lake nearshore and estuary condition is solely for one season of the year – nearshore Great Lakes regions and estuaries may have different conditions at other time s of the year – and so making statements about changes in condition should qualify that these are for a specific time of year. For example, we have discovered extensive blooms of algae on Lake Erie in the depth of winter (February; Twiss et al., 2012), which is linked to summer time hypoxia in the central basin of this lake (Wilhelm et al., 2013; Reavie et al., 2016). Perhaps other blooms occur on other lakes, in coastal estuaries, during winter but we are generally ignorant to coastal condition during seasons other than summer and this may be important to consider.	EPA revised text in the executive summary and Chapter 1 to clarify the results are based on a summer index period.
II.5		Nemazie	Yes, the Eutrophication Index has the appropriate indicators and they appear to be interpreted properly within the 2015 data set as well as the changes over time. The indicators are clearly explained to the reader.	EPA appreciates the comment.
II.5		Hickie	No comment	No response required.
II.6		Scavia	deferred to tox expert	No response required.
II.6		Twiss	deferred to tox expert	No response required.
II.6		Nemazie	I do not feel qualified. However, I think that the indicator was explained in a manner that was understandable to a broad population. If selenium was never found to be above current standards – could/should it be removed as a parameter? Perhaps with only spot checks in future assessments. NOTE: I found it surprising that fish in Lake Erie had the least amount of contamination.	EPA appreciate the comment.
II.6.a		Hickie	The list of Receptors of Concern (TSD Table 7.2) appears to be reasonable choices for the most part. I could see adding lake trout and/or coho salmon as receptors of interest for the Great Lakes but as all that is used to characterize them further is body weight (TSD Table 7.3) they may not add much more to the process.	EPA appreciates the comment.
II.6.a		Hickie	TSD Table 7.3 should be revised and I have some concerns about a few of the values. First, we go from a list of species in Table 7.2 to just one unnamed member from each receptor group – The species selected for inclusion in the table should be named. Which bird from the list weighs 0.13 kg? What are the fish species that weigh 0.34 kg and 23.42 kg? .	EPA revised old Table 7.2 (now new Table 7.3) of the Technical Support Document (TSD) to reflect individual species representing each receptor group. EPA revised old Table 7.3 (now new Table 7.4) of the TSD by adding references.

II.6.a		Hickie	How were these fish weights selected, given that fish keep growing with age? I see that the minimum weight of each receptor was chosen in order to derive the highest FIR values for each species. If the unidentified marine mammal is a harbor seal, the minimum size of an adult may be 58.8 kg but a newly weaned juvenile may be about 10 or 15 kg	EPA appreciates the comment. The values listed in new Table 7.3 of the TSD are literature-based. References are provided in footnote 16 and the references section. Additionally, Table 7.3 of the TSD was revised with species names. Table A.3.1 added showing all species considered for ROCs and references used for body weights and FIRs.
II.6.a		Hickie	In addition, the fish selected as ROCs come from different thermal regimes but there is no means provided to adjust metabolic rate and feeding rate for water temperatures.	EPA appreciates this comment. For the NCCA, the decision to use EPA's "Ecological Risk Assessment for Superfund Sites" recommended approach for developing contaminant screening values was selected because the methods and supporting references were readily available and widely accepted. EPA recognizes that limitations do exist with the generalized approach and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
II.6.a		Hickie	I also don't get how the 340g fish has a feeding rate equivalent to 6.4% of body weight per day while the 550g (warm-blooded) mammal has a mass-specific feeding rate of 7.6% per day. The feeding rate for this fish seems to be too high in this comparison. The metabolic rate (and hence feeding rate) for a homeotherm should be about 10-fold higher than for an equivalent sized poikilotherm.	<p>The food ingestion rate for a 340 g muskellunge (0.064 kg food / kg BW / d; Carlander 1969) is in line with other muskellunge FIRs in literature (e.g. Clapp and Wahl 1996). The FIR for a 550 g female mink (0.076 kg food / kg BW / d) was calculated using the allometric equation for mammals (Nagy 1987; presented as equation 3-7 in EPA Wildlife Exposure Factors Handbook 1993). The EPA checked these values for accuracy based upon this comment and the referenced values and calculations are correct.</p> <p>The EPA did not normalize body weight and food ingestion rates for species life stages or metabolic rates (as reviewer noted). Rather, the EPA based the ecological fish tissue contaminant assessment on the potential for adverse contaminant exposure outcomes (however small the likelihood) to the most sensitive selected species within an NCCA receptor grouping.</p> <p>The EPA added a section in Appendix A describing that this approach may lead to uncertainty that may over- or under- represent the potential for adverse effects to piscivorous birds, mammals or fish. As a nationwide screening level assessment this relatively simple, conservative approach provides a way to compare potential for contamination across diverse aquatic systems.</p>
II.6.a		Hickie	I also don't get how the food ingestion rate for the 23.42 kg fish is just 0.23% of body weight per day with an FIR that is only 2.5 times more than the freshwater fish that is 70 times smaller. Would a 23 kg tuna get by eating just 54 grams of food per day? I think these numbers need to be re-examined. Are there calculation errors?	EPA appreciates the comment and corrected a typo in new Table 7.3 that addresses the food ingestion rate (FIR) issue (0.0539 kg/day revised to 0.539 kg/day). The correct value was used in the assessment.

II.6.a		Hickie	I have not examined the equations in Sample et al (1996) and Sample and Arenal (1999) to see if what I think is a problem is with their equations, but I do note that these references are now getting quite old and there have been considerable advances in measuring “field metabolic rates” in the last 20 years	EPA appreciates the comment. EPA recognizes that limitations do exist with the generalized approach applied for NCCA and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
II.6.b		Nemazie	I do not feel qualified to comment	No response required.
II.6.b		Hickie	I have no concerns with the equations used for deriving the TRVs as they are aimed at a level similar to a screening-level risk assessment other than perhaps a re-examination of the estimates of FIR (noted above).	EPA appreciates the comment. EPA corrected a typo that addresses the FIR issue mentioned.
II.6.b		Hickie	There are ways to improve on these calculations by aiming to adopt a more species-specific approach for the selected ROCs such as using a bioaccumulation model calibrated for each ROC (body size, growth rate, metabolic and feeding rate, and better characterization of their prey) .	EPA appreciates the comment. EPA recognizes that limitations do exist with the generalized approach applied for NCCA and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
II.6.b		Hickie	Doing that may not result in much of a change in the TRV but it would likely improve the confidence level associated with it .	EPA appreciates the comment. EPA recognizes that limitations do exist with the generalized approach applied for NCCA and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
II.6.b		Hickie	I have noted in places that the equations deal with each ROC in a fairly generic way as they are essentially defined by body size and do not address changes with life history such as longevity, growth, reproductive effort, etc. that can affect bioaccumulation processes and hence toxicity. This generic approach may be fine for relatively small organisms with short life spans like a mink, but it may not work as well for larger long-lived mammals such as harbor seals, bottlenose dolphin or walrus which have a large maternal investment in nursing their progeny. As I note in my comments (re page 53) lactational transfer of lipophilic contaminants like PCBs which can result in progeny having higher tissue concentrations than all other members of the population. This could make them more sensitive receptors of concern than smaller mammals like mink.	EPA appreciates the comment. EPA recognizes that limitations do exist with the generalized approach applied for NCCA and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
II.6.c		Nemazie	I do not feel qualified to comment	No response required.
II.6.c		Hickie	In general, NOAELs are suitable for calculating screening values for this type of report. It is difficult for me to say more here as there is no description in the TSD (Chapter 7.4.4) of how the NOAELs were selected for the various contaminants considered, what endpoints they were associated with, nor were the values provided or references they were drawn from. This lack of transparency must be addressed before I would be able to comment on the process.	In the TSD, EPA added information to the description of how TRVs are derived from NOAELs and added an Appendix listing the NOAELs considered, laboratory endpoints and references as well as descriptions of sources of uncertainty in the assessment.
II.7		Scavia	Yes, reference to the standard approaches used for the Great Lakes is clear and understandable.	EPA appreciates the comment.
II.7		Twiss	Yes. The approach to measuring fish contaminants is acceptable. The use of sample from a homogenization of five composite fish fillets is a technique used to provide an example of a sample representative of a fishing effort and the tissue most likely consumed (fillet). This is similar to the EPA Great Lakes Fish and Monitoring Survey Program that samples lake trout (in all lakes, walleye in Lake Erie) on 5-year cycles, and uses 10-fish (entire fish) composites. I appreciate the EPA stating the more conservative Great Lakes Sport Fish Advisory Task Force benchmark (110 ppb) versus the EPA benchmark of 300 ppb for mercury.	EPA appreciates the comment.
II.7		Nemazie	I have concerns with the use of “assessing the population of waters.” Population of waters makes sense from a statistical analysis perspective but can easily be misinterpreted by the broad audience this report is meant to communicate to. I’m also concerned with how the broader public may misinterpret the difference scales for mercury and PCBs. Frankly, I do not understand the differences between EPAs cancer and noncancer benchmarks for PCBs. The fact that 70% meet the Canner Benchmark of >18 ppb for PCBs vs the Noncancer Benchmark of 44% with the higher level of PCB >73 ppb. Is that an error?? I do not believe that was properly explained within the text.	EPA revised the Great Lakes Human Health Fish Fillet Tissue Study section.
II.7		Hickie	I think the presentation is clear and understandable for the most part. I do have a few specific comments in the table below.	EPA appreciates the comment.
II.7.a		Twiss	Yes, the results are clearly resented except for the data for PFOS (Figure 4.8.3), which must be re-configured to reduce ambiguity (see Section II for details).	EPA appreciates the comment and has revised the PFOS section.
II.8		Scavia	These are presented clearly, but see my comments in the I. I. General Impression section about the impacts of ‘unassessed areas”. This needs to be better described, and perhaps addressed differently.	To address this comment, EPA included additional information on why there is unassessed area in the results.

II.8		Twiss	With the exception of the limitations due to inter-seasonal timeframes (see response to Section II.5 above), the approach to show changes in coastal condition over time (at 5-year intervals) is appropriate. The use of standard techniques and sample site selection based on sound statistical protocols increase the confidence the sampling techniques are able to produce results that allow an assessment any change in status over time.	EPA revised text in the executive summary and Chapter 1 to clarify the results are based on a summer index period.
II.8		Nemazie	Yes, the change over time results were very useful. This report has taken an appropriately conservative approach to the analysis particularly pertaining to the changes to “Not Assessed” percentages. While referring to some results as “statistically significant” may be unclear to some – it offers the clarity to the vast majority of the potential readers.	EPA appreciates the comment. EPA did provide additional clarity on why there are unassessed results presented.
II.8		Hickie	Yes, the approach is described clearly. The issue of changes in the number of sites “not assessed” is problematic in presenting and interpreting the temporal changes and the report does a good job of making that clear. I have made some specific comments in the table below about this and whether it would be reasonable to just compare the assessed sites, but I do recognize that this poses problems with the “area-based” presentation of results.	EPA appreciates the comment. EPA did add additional information to the report on why unassessed results are included.
II.8.b		Scavia	See notes above on “unassessed areas”	To address this comment, EPA included additional information on why there is unassessed area in the results.
II.8.b		Twiss	Yes, the conclusions stated are supported by the results. In addition, where there are caveats (e.g., limited benthic samples due to selected sites that had hard substrate, which prevented effective sample collection), these are stated in the text (-callouts on the figures-). These stated caveats provide a good self-critique and do not try to cache information and thereby increase confidence in the conclusions by showing the reader that a very objective approach to data analysis and transparency in reporting was conducted.	EPA appreciates the comment.
II.8.b		Nemazie	The conservative approach that was employed in the analysis support the interpretation of the results. For that reason, I was pleased to see the comparisons and found it to be an important part of the conclusions and the entire report.	EPA appreciates the comment.
II.8.b		Hickie	Yes, they are.	EPA appreciates the comment.
II.9		Scavia	While I appreciate the desire for brevity in the summary report, I think there needs to be some more information brought in from the Technical report. See I. I. General Impression.	To address this issue, EPA added additional technical information to the report and in appendices.
II.9		Twiss	The absence of the connecting waters in the Great Lakes system is misleading. According to Annex 2 of the Great Lakes Water Quality Protocol of 2012 (Canada, USA) the large rivers (St. Marys, St. Clair, Detroit, Niagara) and that connect the Great Lakes and that drain them (St. Lawrence River) are part of the lakes system. The Boundary Waters Treaty (1909) also considers these waterways to be part of the Great Lakes. By the definition used in the NCCA, nearshore water of the Great Lakes are < 30 m deep or < 5 km from shore, whichever is encountered first. Thus, all the connecting waters (including fluvial Lake St. Clair between the St. Clair River and the Detroit River) would be defined as Great Lakes nearshore waters. Figure 2.1 shows that these connecting waters are omitted (grey lines) in the NCCA. The rivers, strait, and fluvial lake that connect and naturally drain the Great Lakes-St. Lawrence River system are referred to as connecting waters (sometimes as connecting channels). Connecting waters are natural meeting places for biota and people and all are main transportation corridors. Each connecting water that is a major river has specifically contaminated areas that reflect past and present industrial activity that gravitated to these regions. Vast and biodiverse wetlands and important fish spawning areas exist in most of these regions, yet they are under tremendous stresses (EC/USEPA, 2009). Connecting waters serve as important ecological, social, and economic intersections in the Great Lakes ecosystem yet they have not received the same degree of attention as the lakes. The fact that these Great Lakes nearshore areas are neglected by the NCCA is a major oversight. I realize that it would be a significant undertaking to incorporate these waters into the NCCA, and I suspect that that will occur in the future. In the interim, I strongly suggest that the US EPA clarify that the connecting waters are not included in the NCCA, just as they should state that the NCCA is for the contiguous United States only.	EPA appreciates the comment. EPA added Appendix A to identify sampling locations in the report and text in the Technical Support Document to clarify the area included in the assessment.
II.9		Nemazie	Please see my general comments in section I above regarding the lack of definitions of “good, fair, and poor” and what that means from an ecological or human health perspective. This is my greatest concern with the draft Report as different people can have different definitions for those three categories. Also was there ever consideration of a category called “Excellent.” In the future, that may add value to the understanding of our coastal systems.	To address this comment, EPA added Appendix B which, describes benchmarks, to the report. The Technical Support Document contains additional details. Currently EPA does not plan to expand to four reporting categories for these indicators,
II.9		Hickie	My most important concern is that the two figures in the executive summary only show the percent of areas in good condition which may present an overly positive spin on the content of the report. I think these bar charts should show the good, fair, and poor percentages so that they are consistent with the figures in the main body of the report. Busy people may only read the executive summary and miss this important information. Along with that, the sections for each of the indicators should present a consistent set of information.	EPA appreciates the comment and added text to the executive summary pointing readers to Chapter 4 for the full set of results. The graphic with a single condition category (good) was retained to streamline the visual.
III. Other Observations	4	Scavia	Should be “Great Lakes” not “estuarine”	EPA corrected the typographical mistake.
III. Other Observations	9	Scavia	What is the justification for 30m/5km. Seem pretty arbitrary?	EPA revised text in Chapter 2 “Design of the Coastal Survey” to address this comment.

III. Other Observations	10	Scavia	These are really not very useful here, and redundant with later maps. Maybe replace with examples of what the sampling stations look like in a few places?	To address this comment EPA revised maps and added Appendix A, which shows sampling locations, to the report.
III. Other Observations	14	Scavia	Why is selenium singled out compared to other chemicals? There is no explanation.	EPA revised text in the report to clarify that selenium has a whole-body aquatic life use criterion which other contaminants do not.
III. Other Observations	52	Scavia	The microcystin sentences are confusing. It starts saying there were no exceedances, but then reports pretty low % areas below the benchmarks	EPA reviewed the information in the report and determined it is correct as written. No change made.
III. Other Observations	1	Twiss	"The NCCA focuses on estuaries and the Great Lakes due to their ecological and economic importance." Missing connecting waters.	EPA appreciates the comment. EPA added Appendix A to the report to identify sampling locations and text in the Technical Support Document to clarify the area included in the assessment.
III. Other Observations	4	Twiss	Again, the risk to humans was low; 55% of estuarine area was at or below EPA's human health benchmark for mercury in fish tissue (43% of estuarine area was not assessed). Missing almost half of sites. BE more conservative in statement	To address this comment, EPA included additional information on why there is unassessed area in the results.
III. Other Observations	4	Twiss	"Areas with hard substrate or areas covered with invasive zebra and quagga mussels often prevented sampling, affecting the ability of the NCCA to determine condition in many areas." High energy environment prevents fine sediment accumulation in much of the nearshore.	EPA appreciates the comment and clarified text in the report related to why some samples could not be collected.
III. Other Observations	5	Twiss	"The NCCA continues to investigate ways to improve sediment assessment success." See comment directly above.	EPA appreciates the comment and clarified text in the report related to why some samples could not be collected.
III. Other Observations	5	Twiss	"Six percent of nearshore area had fish with mercury levels above the human health benchmark based on analysis of plugs from fish fillet tissue." This is not clear since it states on page 7 (Contaminants in Fish Tissue) that "In the Great Lakes only, EPA collected additional fish to assess fillet tissue for polychlorinated biphenyls (PCBs), per- and polyfluoroalkyl substances (PFAS), and mercury, using entire fillets." Does this mean that in GL and estuaries that tissue plugs are measured for Hg? On pg. 20 (para. 4) it says that fillets are compared in addition to the "300 ppb benchmark" but does this mean that the values in fillets were compared to the benchmark or also compared to Hg in tissue plugs?. According to page 37 (para. 2) this is correct, so it would be better to make this more clear earlier in the text.	EPA appreciates the comment. EPA added information to Chapter 2 "Design of the Coastal Report" summarizing the three approaches for analyzing fish that are presented in the report.
III. Other Observations	7	Twiss	"Estuaries and the Great Lakes also receive pollutants and sediments from activities far upstream." Not Lake Superior. It is the headwater of the Great Lakes system. Like all the GL it receives atmospheric input of contaminants, e.g. toxaphene (Muir, D. C., Whittle, D. M., David, S., Bronte, C. R., Karlsson, H., Backus, S., & Teixeira, C. (2004). Bioaccumulation of toxaphene congeners in the Lake Superior food web. Journal of Great Lakes Research, 30(2), 316-340.) pesticide used heavily in the Southern United States.	EPA revised text in the report to indicate that pollutants and sediment enter estuaries and the Great Lakes from within their watersheds.
III. Other Observations	7	Twiss	As a GL limnologist, I am aware of the use of the term estuaries in the GL. However, these refer to small tributaries that contain water chemistry very different from the receiving waters of the nearshore GL. They are not used with respect to the very large rivers (St. Marys, St. Clair, Detroit, Niagara) that drain one Great Lake to the next and the Upper St. Lawrence River, all of which are considered nearshore waters of the GL. This distinction should be made clear in this document.	EPA revised text in the report to address this comment related to the term estuaries as applied to the Great Lakes.
III. Other Observations	8	Twiss	"The NCCA focused on the 48 contiguous states...." This should be stated in the Executive Summary as well.	EPA revised text in the executive summary to clarify the area assessed.
III. Other Observations	11	Twiss	Suggest replacing the phrase "...microscopic algae that cause such blooms." with "...phytoplankton, microscopic algae and cyanobacteria, which may cause blooms)."	EPA revised the text to address the comment.
III. Other Observations	11	Twiss	Suggest replacing "Algal Toxins" with "cyanotoxins", since no algae produce microcystins (the are produced by cyanobacteria, a type of phytoplankton).	EPA revised the terminology in the report.
III. Other Observations	12,14, 29 , 44	Twiss	Suggest replacing "Algal Toxins" with "cyanotoxins", as described above unless this includes toxins such as those produced by dinoflagellates (red-tides) or others (e.g. diatom-produced toxins).	EPA revised the terminology in the report.
III. Other Observations	12, 20	Twiss	Suggest rephrasing "Benthic macroinvertebrates are insects, worms, mollusks and crustaceans that live in sediments. To "benthic.... in and on sediments..." to more accurately state the benthic habitat as is stated in the figure caption on page 20.	EPA did not revise the text because crews use sample grabs to assess benthic infauna not epifauna.
III. Other Observations	22	Twiss	Suggest rephrasing "Excess nutrients can cause increased growth of algae, known as harmful algal blooms." To "Excess nutrients can cause increased growth of phytoplankton (algae and cyanobacteria), known as harmful algal blooms."	EPA revised the text to address the comment.
III. Other Observations	22	Twiss	Suggest rephrasing "Decomposing algae and plants consume dissolved oxygen, stressing aquatic life and ecosystems." to "Decomposing biomass consumes dissolved oxygen, stressing aquatic life and ecosystems."	EPA revised the text to address the comment.
III. Other Observations	34	Twiss	Lake Erie: it is indeed the warmest in summer but also the coldest in winter, both factors are due to its shallow nature.	EPA revised the text to address the comment.
III. Other Observations	34	Twiss	Why are the lakes listed in this order? Why not list them by elevation above sea level to indicate direction of flow to the ocean (Superior, Huron/Michigan*, Erie, Ontario)? Technically Lake Huron and Michigan are one lake with two large basins.	EPA agrees and revised the order that the Great Lakes are presented in graphics.



III. Other Observations	34	Twiss	No. Lake Ontario drains to the North Atlantic Ocean via the St. Lawrence River only (not the Niagara and St. Lawrence Rivers, as stated); the way it is written, someone might think that Lake Ontario has two outflows.	EPA revised the text to address the comment.
III. Other Observations	34	Twiss	Lake Huron: Point of interest is that it includes two large bays: Georgian Bay and Saginaw Bay. Yes, but of more interest is that it contains the largest freshwater island in the world, Manitoulin Island.	EPA appreciates the comment but opted not to include this feature in the description because it is in Canada.
III. Other Observations	36	Twiss	Mention of the Huron-Erie Corridor (aka HEC) is stated. I know what this refers to (it refers to the region at the outflow of Lake Huron (the St. Clair River – Lake St. Clair – Detroit River) system. The average reader not familiar with the Great Lakes would not know what the HEC is. I suggest adding a map that contains all the lake names, and the names of the connecting waters (rivers, strait, fluvial lakes) in the system.	EPA revised the text to address the comment.
III. Other Observations	37	Twiss	I know of no example of excessive algal growth hampering navigation. Of greater concern is overabundance of a macrophytic alga Cladophora that grows in nearshore regions, sometime extensively.	In this statement, EPA is referring to algae in a general sense, including macroalgae. No change made to text.
III. Other Observations	38	Twiss	See note above (39,2): Change text from “Because it is shallower and warmer than the other lakes,...” to “Because it is shallower and warmer than the other lakes during summer,...”.	EPA revised the Lake Erie segment to focus on the intensification study that was conducted in summer 2015.
III. Other Observations	38	Twiss	Change to read: Chlorophyll a levels are frequently used to estimate phytoplankton (microalgae and cyanobacteria) biomass present.	EPA revised the Lake Erie segment to focus on the intensification study that was conducted in summer 2015.
III. Other Observations	Chapter 4	Twiss	I like having the Great Lakes summed data at the top of the figure. However, why are individual lakes listed in this order? There should be a reason. Adding value to the figures by indicating water flow (list in order from Lake Superior to Lake Ontario) would be advantageous – for example, Does condition decrease with distance downstream?.	EPA agrees and revised the order that the Great Lakes are presented in graphics.
III. Other Observations	44	Twiss	“Under high-nutrient conditions, cyanobacteria, or blue-green algae, can reproduce rapidly, causing algal blooms.” Actually, cyanobacteria (blue-green algae) typically grow more slowly than eukaryotic phytoplankton (algae). However, conditions (such as low wind) can cause them to appear rapidly (e.g. Microcystis is buoyant) – giving the impression of rapid growth. Suggest stating this as follows: “Under high-nutrient conditions, cyanobacteria, or blue-green algae, can grow abundantly, and under certain condition such as low wind, rapidly appear on the surface, causing surface blooms.”	Based upon EPA and CDC publications describing rapid cyanobacterial growth, this text was not revised.
III. Other Observations	44	Twiss	Change to “Under some conditions the cyanobacteria ...”.	EPA revised the text to address the comment.
III. Other Observations	49	Twiss	The figure states “Percentages of the Great Lakes nearshore sampled population containing fish with fillet PFOS concentrations above the human health fish tissue benchmark” and the figure states 100%. At first glance, it looks like 100% are indeed above the benchmark of 68 ppb; but the text associated with the pie chart explains that 0% are above. This is not at all a clear representation of the data.	EPA removed graphic 4.8.3 and revised the Great Lakes Human Health Fish Fillet Tissue Study section.
III. Other Observations	51	Twiss	Condition of rivers are stated but these are not the rivers in the Great Lakes system that connect the lakes (St. Marys, St. Clair, Detroit, Niagara, St. Lawrence); this must be made clear.	EPA appreciates the comment. EPA added Appendix A to identify sampling locations and text in the Technical Support Document to clarify.
III. Other Observations	51, 52, 52	Twiss	The Great Lakes contain significant riparian wetlands. Wetlands are mentioned in this NCCA document but it is not clear if any of these wetlands were those of the coastal Great Lakes system.	The report describes the target population of nearshore Great Lake waters and estuaries applicable to this report and references the National Wetland Condition Assessment report which does focus on wetlands.
III. Other Observations	53	Twiss	Did this occur in the pandemic year or was it just planned? “During June through September 2020, crews from states, tribes, EPA and other federal agencies sampled more than 1,000 sites in estuarine and Great Lakes nearshore waters.”	EPA revised the text to address the comment.
III. Other Observations	54	Twiss	This reference is incomplete.	EPA corrected the reference.
III. Other Observations	TOC #1	Nemazie	For both “Estuaries” and “Nearshore Great Lakes” recommend a better delineation for “Ecological Indicators” and Human Health Indicators – perhaps an additional indentation	EPA corrected the formatting error.
III. Other Observations	1	Nemazie	Recommend that it’s made clear this is assessment is only for the 48 contiguous states.	EPA revised text in the executive summary and Chapter 1 to clarify.
III. Other Observations	3	Nemazie	2nd sent: should be “areas”	EPA appreciates the comment but opted not to make a change so that the sentence emphasizes “area” as a whole not individual areas or locations.
III. Other Observations	3	Nemazie	Consider changing “however” to “while” since that is a positive change even if it impacts the interpretation of the analysis of results	EPA revised the text to address the comment.
III. Other Observations	4	Nemazie	“...algal blooms <u>are ephemeral</u> and produce ...” This sentence also suggests that all harmful algal blooms produce toxins but the definition used in this report clearly states a harmful algal bloom, can be harmful due to its ability to consume oxygen .	EPA revised the text to address the comment.

III. Other Observations	4	Nemazie	Last sentence: refers to recreational fisherman checking with the "...state health department..." – elsewhere in the document it correctly suggests that fisherman "should consult state, tribal, or local advisories" which is much broader than this sentence.	EPA revised the text to address the comment.
III. Other Observations	6	Nemazie	2nd sent: Recommend changing "In addition..." to "However"	EPA revised the Great Lakes Human Health Fish Fillet Tissue Study section.
III. Other Observations	6	Nemazie	2nd sent: "EPA, other federal agencies, and states..." should "tribes" be added to this list ??	EPA revised the text to address the comment.
III. Other Observations	7	Nemazie	3rd sent: "A variety..." I recommend including groundwater into this list.	EPA revised the text to address the comment.
III. Other Observations	7	Nemazie	Last sent: "...nationwide data collection and reporting..."	To keep the wording more concise, EPA opted not to make this change.
III. Other Observations	7	Nemazie	Is not referenced within the text on that page as best as I can find	The note is referenced in a text box. No changed required.
III. Other Observations	9	Nemazie	2nd sent: This is a very awkward sentence and the use of "...waters of interest in groups (or strata)..." sounds like legalize and may be misinterpreted by a general audience.	EPA revised the text to address the comment.
III. Other Observations	10	Nemazie	I do not recommend you use the word "population" in reference to waters. That's too much of a statistical term and can easily be misinterpreted to refer to organisms, fish, or humans.	EPA added additional information in the report to clarify, but the use of the term population is appropriate in this context.
III. Other Observations	13	Nemazie	3rd sent: recommend "...5-20..." instead of "...five to 20..."	EPA did not to make this editorial change but retained "five" per style guide.
III. Other Observations	18	Nemazie	If SF Bay is the largest estuary in the West region is the word "sampled" necessary. That implies there is a larger estuary in the West region that was not sampled. If so, which one and why not??	EPA revised the text to address the comment.
III. Other Observations	19	Nemazie	The graphic is missing the region header of "North East"	EPA revised the header.
III. Other Observations	20	Nemazie	Not sure what a "low-level" predator is within this context – due you mean mummichog as the graphic suggests. Too easy to misconstrue. Certainly some high level predators, such as sturgeon or striped bass eat worms, mollusks, and crustaceans.	EPA revised the text to address the comment.
III. Other Observations	21	Nemazie	1st small interpretive box: "...the improvement was, in part, <u>due to...</u> " I think that may better capture what is taking place without while maintaining a conservative approach to this potential bias.	EPA revised the text to address the comment.
III. Other Observations	21	Nemazie	Due to the bias you may want to use the word "indicates" within this sentence	EPA revised the text to address the comment.
III. Other Observations	26	Nemazie	Not sure what "protective" means in this sentence. Too easy to misconstrue.	EPA revised the text to address the comment.
III. Other Observations	27	Nemazie	If 79% were at or below benchmarks and 21% were not assessed did any samples have excess selenium. If not, then clearly state that. If a few and the percentages are rounding errors perhaps just state the number that were above benchmarks. Presumably it would be a VERY low number of sites.	EPA added text to the report to clarify selenium levels in estuarine fish samples were below the benchmark.
III. Other Observations	28	Nemazie	I think this is a good time to mention that grab sampling often does not capture ephemeral events such as such as being measured for enterococci contamination.	EPA updated microcystins text to address this comment. Enterococci text already discussed potential changes in concentrations after storms and directed readers to check with local monitoring programs for risks at specific locations.
III. Other Observations	Page 29 and 30	Nemazie	Page 30 refers to one site that had microcystins above benchmark but page 29 states "in all" estuarine waters. So does that mean the one sample of microcystin was in the Great Lakes or is there an error in the text? I found the answer on page 44. Therefore page 30 should refer to one sample with high microcystin in Lake Erie.	EPA removed the ELISA Highlight (Page 30). No additional clarifications required.
III. Other Observations	31	Nemazie	Last sent: remove "themselves" as it is not needed	EPA revised the text to address the comment.
III. Other Observations	34	Nemazie	I found the use of a blackened line to delineate the sampling area to be VERY difficult to see. I recommend changing the color so it stands. If that change is made then the regional estuarine should also match that same color.	To address this comment EPA revised maps and added Appendix A, which shows sampling locations, to the report.
III. Other Observations	41	Nemazie	Again, the use of "protective" in the context of benchmarks used to assess condition. I do not believe that word should be used in this context as it can be easily misconstrued.	EPA added text to the report to clarify.
III. Other Observations	42	Nemazie	Same comment that I made for page 27 regarding selenium.	EPA revised the text to address the comment.
III. Other Observations	47	Nemazie	PFAS are a group of synthetic chemicals..."	EPA revised the text to address the comment.
III. Other Observations	52	Nemazie	This is the same table as 4.8.1 - does this need to be repeated here as opposed to being simply referenced	EPA removed the table from the Conclusion section of the report.

III. Other Observations	i	Hickie	What is the intended audience for this document? If it is aimed at the broader public, I think it is essential that a glossary of “scientific terms” is needed. Examples from the first few pages of text include: eutrophication, enterococci, PCBs, PFA, chlorophyll a....., etc.	EPA added additional definitions to technical terms when they appear in the text. EPA will consider development of a glossary of terms.
III. Other Observations	3	Hickie	Key findings....“Results provided here focus primarily on coastal area in good condition;” resulted in a first impression that this was cherry-picking the good news and leaving lesser outcomes to later in the document that some readers might not get to.	EPA appreciates the comment and added text to the executive summary pointing readers to Chapter 4 for the full set of results. The graphic with a single condition category (good) was retained to streamline the visual.
III. Other Observations	2	Hickie	The descriptions of the indicators is good as far as it goes but this section “What did the survey evaluate” and the following Key findings” gives no background whatsoever on how the rankings of “good” to “poor” were determined. This means of ranking or scoring is described starting on page 13 – maybe noting this in the executive summary would be good? It may be useful to include a brief outline on how these indicators were evaluated, scored, or ranked (not sure what the best term would be). A fairly generic example could be given in a figure.	To address this comment, EPA added Appendix B, which describes benchmarks, to the report.
III. Other Observations	3 and 4	Hickie	These bar charts only show the percent “good”, while accompanying text provides limited and inconsistent information on the proportions ranked as fair or poor. Also, it is not shown how these have changed since the 2010 report (although a few are mentioned in the text). “Change over time” is one of the three core purposes of the survey. What I’m getting at is that the report should strive for consistent treatment/representation of the data from start to finish	EPA appreciates the comment but opted to focus on current condition and discuss change when there was a significant finding not attributed to changes in the percent of unassessed waters.
III. Other Observations	4 and 4	Hickie	. These figures should be stacked bar charts showing percent “good, fair and poor” here in the executive summary?	EPA appreciates the comment and added text to the executive summary pointing readers to Chapter 4 for the full set of results. The graphic with a single condition category (good) was retained to streamline the visual.
III. Other Observations	3	Hickie	“In the West” strikes me as a vague. Does it mean “along the West coast”? I finally see that “West” is defined on page 18.	EPA revised the text in the Executive Summary to address the comment and added Appendix A with maps of the regions to the report.
III. Other Observations	4	Hickie	Was there a contaminant that dominated at the “poor” locations (if so, which one(s)), or did it vary with location?	Information on the contaminants that most frequently exceeded benchmarks is included in the textbox associated with each ecological fish tissue graphic.
III. Other Observations	5	Hickie	“Lake Erie was rated poor for phosphorus in 48% of the nearshore area.” Is it more appropriate to say “...in 48% of sampled nearshore locations.” They don’t really mean the same thing. This issue carries throughout the document – one of extrapolating from sampled “points” to “area”.	EPA appreciates the comment. It is appropriate to use area rather than sites or locations. The probabilistic survey is specifically designed to allow for estimation of the condition of the target population of waters not only individual sites. No change required.
III. Other Observations	6	Hickie	Is it still routine for USEPA to report concentrations as ppb or ppm? As opposed to mg/kg or ug/kg? I note that metric units are used in some places in the report (e.g., page 14 – Enterococci and Algal Toxins)	EPA appreciates the comment. EPA still uses ppb in public documents. No change required.
III. Other Observations	6	Hickie	The conclusion section correctly highlights eutrophication as a significant problem, but is it the most significant? (It is noted on page 22 that it is “one of the most critical ...”) Any mention of contaminant issues (mercury and PCBs) is notably absent from the conclusions which I believe is entirely inappropriate given that only 15% and of estuarine/coastal and 17% of Great Lakes report good results for ecological effects of contaminated fish (the lowest of the seven indicators.	EPA appreciates the comment. EPA chose not to highlight findings in the conclusion of the executive summary if they have a large amount of unassessed waters. That information is available in the body of the report.
III. Other Observations	8	Hickie	I like that the design followed a stratified random method of site selection. The report reports results in terms of “percent of area” that ranks a s good, fair, or poor, but Chapter 2 does not describe how the transition from sampling “sites” to report results in terms of “area” is achieved. Was some process used for this transition or is the use of “area” just a change in wording?	EPA added text to the report to clarify the application of the randomized design to the assessment and results.
III. Other Observations	8	Hickie	“Coming up in this report” is a good construct.	EPA appreciates the comment.
III. Other Observations	11	Hickie	It would be prudent to list the contaminants measured for the indicator “Ecological Effects of Fish Tissue Contamination”	EPA added information to Appendix A of the Technical Support Document.

III. Other Observations	13	Hickie	The section on fish collection makes no mention of well-known factors (species, trophic levels, size, age, lipid content) affecting concentrations of bioaccumulative contaminants such as PCBs and mercury. How was this addressed in sampling, making composite samples and data interpretation?	For the NCCA, the decision to use EPA's "Ecological Risk Assessment for Superfund Sites" recommended approach for developing contaminant screening values was selected because the methods and supporting references were readily available and widely accepted. EPA recognizes that limitations do exist with the generalized approach and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
III. Other Observations	13	Hickie	Scores of "0" are classified as poor, scores of "1" are good. What scores as "fair"? This shows up elsewhere in the report.	To address this comment, EPA added Appendix B (to the report), which describes benchmarks and added information to the text.
III. Other Observations	14	Hickie	Could a reference be provided for where these selected "benchmarks for adverse effects" are summarized? I would assume they are in the TSD which is referenced in several other places in this report.	To address this comment, EPA added Appendix B (to the report), which describes benchmarks.
III. Other Observations	14	Hickie	It appears as though the "ecological effects" evaluated here are for the traditional "growth, mortality, reproduction" endpoints, and that effects based on biomarkers for endocrine disruption, immunotoxicity, etc. are not used. I understand that there are challenges in doing so but would encourage that they be given some mention and be considered as significant endpoints in the future. They are especially important for assessing toxicity in species that cannot be tested in the lab, such as marine mammals.	EPA appreciates the comment and will consider these endpoints for future research and assessments.
III. Other Observations	14	Hickie	I also note here that the underlying NOAELs used in scoring this indicator are not summarized in Chapter 7 of the TSD.	EPA updated Chapter 7 of the TSD and added Appendix A (TSD) to address this comment on NOAELs.
III. Other Observations	15	Hickie	What are the target fish species and minimum size for both freshwaters and estuaries?	EPA added information on fish collection and processing to Chapter 2 (of the report) and fish species in Table A.4.1 and A.4.2 (TSD) to address this comment.
III. Other Observations	15	Hickie	This paragraph mixes metric (0.3 milligrams/kg) and ppb in the same paragraph. Consistent units should be used throughout. (ppm and ppb are increasingly viewed as outdated. Numerous other instances of this throughout the document.	In this section of the report, the two terms are be equated to one another to assist the reader. No change required.
III. Other Observations	15	Hickie	Source for the PFOS benchmark?	EPA added text to the report on PFOS values to address this comment.
III. Other Observations	19	Hickie	The explanation of how to read/interpret the bar charts is very well done and should be very helpful in making the document more accessible for the general public. Well done!	EPA appreciates the comment.
III. Other Observations	24	Hickie	It is nice to see that by doing stratified random sampling, sediment quality appears to be good in most places. Should it be noted that this strategy may miss small known hotspots? I do recognize that the NCCA is not aimed at reporting on hotspots (nor does it exclude them) but their existence should be noted.	EPA appreciates the comment and added text to the report to clarify that likely/known areas of contamination are not targeted through the probabilistic survey.
III. Other Observations	27	Hickie	Mixing of metric units (used in the scientific community) and imperial (square miles used in the public sphere of the U.S.) always seems odd to me. Just a Canadian thing!	EPA appreciates the comment. The report attempts to use terminology/units that will be understood by the target audience.
III. Other Observations	31	Hickie	How these data for mercury are presented is fine, as is the text on this page, however, interpreting it from a risk perspective (and therefore the ranking) is difficult to make sense of as I don't know what sort of fish were used in the samples and how that could shape the results. As noted elsewhere – species, trophic level, age, and size all affect mercury concentrations.	EPA added information on fish collection and processing to Chapter 2 (of the report) and fish species in Table A.4.1 A.4.2 (TSD) to address this comment.
III. Other Observations	33	Hickie	This page is a very helpful guide – please keep it.	EPA appreciates the comment.
III. Other Observations	35,36	Hickie	Given that there was a high proportion of sites where samples could not be collected or assessed, will EPA use these data to modify or refine the site selection process to reduce this problem in the future? Not something for this report.	EPA appreciates the comments and is always looking for ways to improve the survey, our sampling success, and how we might account for/assess area where samples cannot be collected (no sediment exists, for example).
III. Other Observations	37	Hickie	In this figure and others, is the Average condition a simple arithmetic mean of the values presented for the five lakes? Or is the average based on scores at all the sample sites across the lakes which would effectively be a weighted mean (taking into account the number of sites on each lake)? This comes back to the use of "percent of nearshore area" in these figures.	EPA added text to the report to clarify the application of the randomized design to the assessment and results.

III. Other Observations	38	Hickie	It is noted that Lake Huron saw a significant drop in area rated good, yet this is not discussed. Are there any reasons for this drop?	EPA appreciates the comment. Additional analyses and sampling will be needed to understand the change and determine if it is a trend.
III. Other Observations	39	Hickie	The results here for Lake Ontario look bad until one sees that it is because 58% was unassessed. When one excludes the “unassessed”, Lake Ontario shows a 50:50 split between good and fair sites. As noted previously, can the selection of sample sites be refined to reduce the large number of unassessed sites in Lake Ontario?	EPA appreciates the comment. The NCCA survey is not designed to assess only coastal areas with sediment, as such there are areas where data cannot be collected for a variety of reasons. EPA is always looking for ways to improve the survey, our sampling success, and how we might account for/assess area where samples cannot be collected (no sediment exists, for example).
III. Other Observations	41	Hickie	As noted elsewhere, it is not clear what fish are being monitored here with regard to species, size/age, and trophic level. Doing wildlife risk assessment should aim to match the sample make-up to the diet of the wildlife of concern (ROC). If the fish sample is a composite of the fish caught, how does it compare to the “food basket” for the wildlife?	For the NCCA, the decision to use EPA's "Ecological Risk Assessment for Superfund Sites" recommended approach for developing contaminant screening values was selected because the methods and supporting references were readily available and widely accepted. EPA recognizes that limitations do exist with the generalized approach and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
III. Other Observations	42	Hickie	This figure appears to send a positive message that contaminants of concern are in decline, but may be due to the inclusion of the unassessed sites in making up the bar charts (i.e., “may not reflect a true change”).	EPA added text to the graphic and related callout box in the graphic to address this comment.
III. Other Observations	42	Hickie	It appears that the statistical analysis includes the “not assessed category”, but a good case could be made to exclude it from the analysis. I guess it comes down to whether the percentages represent “sampling sites” versus “areas” which I have raised previously .	EPA added text to the report to clarify the application of the randomized design to the assessment and results.
III. Other Observations	42	Hickie	It would be nice to know which contaminant(s) are driving this apparent decline. Is it PCBs ? Interesting too that the text focuses on selenium – but it is not clear why selenium deserves this level of attention.	EPA appreciates this comments and will consider these types of analyses for future reporting.
III. Other Observations	43 and 44	Hickie	While not an expert in this area, I suspect that Enterococci and algal toxin levels would be transitory in nature and likely to be more elevated when water temperatures are warmest (July/August). This would suggest then that timing of sampling could be a factor in detecting samples (areas?) that exceed the benchmarks. Is this addressed anywhere in sample design or analysis?	EPA added text to the report to clarify that sampling occurs in summer and the ephemeral nature of microcystins.
III. Other Observations	45	Hickie	Good to see in the lower right text box that EPA is reviewing field procedures for fish sampling. Reducing the “not assessed” areas would be very helpful – Of the 36% of Lake Ontario assessed, 75% is below the benchmark which may be closer to the true situation than the 27% shown in the figure.	EPA appreciates the comment.
III. Other Observations	46	Hickie	Thanks for including the description of how the composite samples were formed. It would be nice to know what species were included in this effort and how it reflects what fishers tend to consume (similar issue as noted regarding fish samples for the “Ecological Effects” indicator – I suspect that would be a frequent question from people that would read this report.	To address this comment, the EPA added Tables A.4.1 and A.4.2 to the Technical Support Document. EPA also notes that Tables 8.1 and 8.2 in the Technical Support Document show the fish species that were analyzed.
III. Other Observations	47	Hickie	ppb versus ug/kg or ng/g? Units should be consistent throughout the document. (good to see on the following page that ppb is related to mg/kg).	EPA appreciates the comment and made the units consistent.
III. Other Observations	47	Hickie	I assume these are expressed on a tissue wet weight basis (ah – this is stated in the following page).	No response required.
III. Other Observations	48	Hickie	It is still not clear how data from 152 composite fish samples are transformed into nearshore areas of “n” square miles. I’m guessing that the random sample taken within each “sampling block” is deemed to be representative of a certain area. This seems to preclude the possibility of any significant variability within blocks – which clearly is not the case as shown by contaminant hotspots (Great Lakes Areas of Concern).	EPA added text to the report to clarify the application of the randomized design to the assessment and results.
III. Other Observations	48	Hickie	I also find it hard to accept describing the fish data as a “sampled population”. This seems to be a statistical view rather than a biological view of “population”.	EPA revised the description of target population in the report to address this comment.
III. Other Observations	50	Hickie	Could you include here the web links where these data can be found. I imagine they are given elsewhere in the document, but it is helpful to place them in more than one location, especially when they are noted like this.	EPA included links to the GLHHFTS data in the Technical Support Document. The link to these data is <a href="https://www.epa.gov/fish-tech/national-coastal-condition-assessment-great-lakes-human-health-fish-tissue-studies">https://www.epa.gov/fish-tech/national-coastal-condition-assessment-great-lakes-human-health-fish-tissue-studies</a> .

III. Other Observations	51	Hickie	Good that the issue of changes in sampling success is raised as a possible driver of the apparent changes.	EPA appreciates the comment.
III. Other Observations	52	Hickie	This table is a repeat of table 4.8.1. I don't see any need to include it again.	EPA removed the table from the Conclusion section of the report.
III. Other Observations	53	Hickie	The approach presented in Chapter 7 of the TSD updating the "ecological fish tissue contaminant index" is suitable for this sort of screening level risk assessment. I will note, however, that the relatively simple approach used excludes the important process in marine mammals of lactational transfer of lipophilic contaminants like PCBs which can result in progeny having higher tissue concentrations than all other members of the population. This could make them more sensitive receptors of concern than smaller mammals like mink.	EPA appreciates the comment.
III. Other Observations	53	Hickie	I appreciate the inclusion of the "What's Next" section. As it was raised in several locations in the report, it would be good to add a statement on what changes in sampling strategy/effort were taken to reduce the number of "not assessed" locations that impede the interpretation of some indices	To keep the report relatively brief, EPA included information on changes to field protocols in the TSD.
III. Other Observations	55	Hickie	I don't see the reference to the TSD included here. Will it be added?	EPA added a reference to the TSD.
III. Other Observations	76	Hickie	Does this include marine mammals that inhabit estuaries such as bottlenose dolphin, harbor seals, etc. that are especially adept at bioaccumulating POPs? OK	EPA considered marine mammals but they were not found to be the most sensitive among the list of piscivorous mammals.
III. Other Observations	76	Hickie	(P84 Mink are used as ROC mammal due to small size and highest ingestion rate).	EPA appreciates the comment. No change required.
III. Other Observations	76	Hickie	The wildlife exposure handbook makes no reference to contaminant transfer by lactation which has been shown to be equivalent to an extra trophic level.	For the NCCA, the decision to use EPA's "Ecological Risk Assessment for Superfund Sites" recommended approach for developing contaminant screening values was selected because the methods and supporting references were readily available and widely accepted. EPA recognizes that limitations do exist with the generalized approach and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
III. Other Observations	77	Hickie	Reference to Wagemann (1997) is fine but could, none the less, be updated to confirm it remains valid.	For the NCCA, the decision to use EPA's "Ecological Risk Assessment for Superfund Sites" recommended approach for developing contaminant screening values was selected because the methods and supporting references were readily available and widely accepted. EPA recognizes that limitations do exist with the generalized approach and more research is needed to continue to strengthen our ability to interpret the ecological relevance of measurable contaminants found in fish, in a nationally consistent and appropriate way.
III. Other Observations	77	Hickie	"including congeners 8..." ? Does this mean that other congeners may be included in some cases or does it mean Only these congeners are included?	EPA added a new Table 7.2 to the TSD with a list of all target analytes including those that comprise total PCBs and clarified language in the text to address this comment.