

# Response to Comments Provided on the Draft of the 2018 Iowa Nutrient Reduction Strategy Annual Progress Report 4 March 2019

## **Introduction**

This is a summary of the comments received on the November 2018 draft of the Iowa Nutrient Reduction Strategy Annual Progress Report. The Annual Progress Report, revised and published each year, provides updates on point source and nonpoint source efforts related to specific action items listed in the elements of the Iowa Nutrient Reduction Strategy. The Annual Progress Report also provides updates on statewide efforts and activities that aim to achieve reductions in nitrogen and phosphorus loads. The NRS documents, including each year's Annual Progress Report, can be accessed at [www.nutrientstrategy.iastate.edu](http://www.nutrientstrategy.iastate.edu).

This comments summary document contains responses to comments and identifies areas of the Annual Progress Report that were modified.

The draft of the Annual Progress Report was available to member organizations of the Water Resources Coordinating Council and the Watershed Planning Advisory Committee, and the comment period was open from November 15 to December 2, 2018.

The following organizations submitted comments on the draft report:

- Environmental Protection Agency Region 7 (page 2)
- Iowa Farm Bureau Federation (page 3)
- Sierra Club Iowa Chapter (page 10)

Page numbers referenced in the following comments and responses were adjusted to reflect the final, published version of the 2018 Annual Progress Report.

## **Summary of comments from representatives of Environmental Protection Agency Region 7**

**Comment:** My only suggestion would be whether you would want to include anything in the Executive Summary about the fact work is progressing, data are being collected, but it is really too soon to say definitively about how the data are trending. While IA is seeing positive signs, there is simply not enough data to confidently project a long term trajectory at this point.

**Response:** Thank you for this suggestion. Partly in response to this comment, a preface to the Annual Progress Report has been added to provide more context at the front of the report concerning the expected capacity to detect trends in the impacts of Iowa Nutrient Reduction Strategy efforts.

## Responses to comments from representatives of the Iowa Farm Bureau Federation

*Note: Some comments were grouped by topic to provide comprehensive responses*

General & Executive Summary Comments...

### Comment:

- IDALS, DNR and ISU should provide a summary statement that provides context of the initial, unprecedented progress of the INRS. If the agencies don't say it, no one else will, or opponents will use the lack of such a statement to say something contrary.
- Some additional comment and context is needed for some items. Most people will only read the executive summary, not the entire report. This is your only chance to communicate with most readers. It is fine to add additional copy in the executive summary section to provide the necessary details and context to increase general understanding of overall progress.

**Response:** Thank you for these suggestions. Partly in response to these points, a preface has been added to the Annual Report that aims to provide additional context around the measured progress and the remaining challenges associated with Iowa Nutrient Reduction Strategy efforts.

### Comment:

- Since this will be an online report, you can include links to other sections of the report that provide more detail or to other supporting documents (in the hopes that more people will read more of the report).
- More graphics would help tell the story.

**Response:** The Annual Report aims to provide detailed overview of programs and efforts that were implemented during the reporting period, and reference external sources when succinctness is deemed appropriate. The primary focus of the report is to thoroughly summarize and describe ongoing efforts and measures of progress, but work is underway to develop smaller reports, website features, and communications strategies that also convey the report's contents. In addition, the visualizations and graphics continue to be developed to effectively communicate the data and metrics that are reported in the Annual Report.

### Comment:

- Due to the significance of SF 512 and the resources it provides this fiscal year (beginning July 1), the INRS annual report reporting period should be adjusted this year (or at least by next year) to match-up with the resources the state provides. Alternatively, this additional significant detail this year could be provided for in a summary statement, as suggested in "a" above. SF 512 and the resources it provides must not go unmentioned in the executive summary.
- An agency summary statement on the passage of SF 512 in the executive summary in this reporting cycle could say, for example:
  - With the approval of SF 512, the Iowa Department of Agriculture & Land Stewardship is implementing the nonpoint ag land portion this year (fiscal year 2019 beginning July 1, 2018) with a \$2 million investment focused on practice

implementation in selected priority watersheds. To accomplish this, there's a new "edge-of-field" practice coordinator working statewide to scale-up implementation of practices in targeted watersheds, and work in other watersheds as the opportunities develop. This new coordinator is also working specifically with three new watershed implementation coordinators in the North Raccoon, the Middle Cedar and the South Skunk Watersheds to get more nutrient reduction conservation on the ground. This targeted approach will be "scaled-up" and expanded to more watersheds in the years ahead as more of the dedicated, sustainable funding becomes available (\$4 million in FY 2020 and \$15 million in FY 2021 and thereafter until FY 2029).

**Response:** The SF 512 is reported as an "anticipated funding source" in the Annual Report. Because the bill was signed on July 1, 2018—after the end of the official 2018 NRS Reporting Period—a more detailed summary and associated activities will be provided in the 2019 NRS Annual Progress Report. That stated, the preface that has been added to the 2018 Annual Report provides additional context on the expected impact and implications of this new source of state funding for NRS implementation.

**Comment:** In the main body of the report, the section regarding nutrient trading is premature in its suggestion that it will be implemented by the end of 2018. There is stakeholder discussion that the department does not have authorization for such a program and authorizing legislation or an administrative rule may be necessary. This section needs to communicate that this is still being discussed with stakeholders.

**Response:**

The report states the NRE structure and WQCT framework will be submitted to DNR by the end 2018, not that it will be implemented by the 2018. The DNR and ISU will be working closely with interested stakeholders as we work towards implementation.

As stated in the annual report, "The DNR and ISU are working closely with stakeholders during this phase. Currently, there are five main areas of focus:

- 1) Process –NPDES permit integration (DNR) and practice application submittals (ISU and DNR)
- 2) Incentives – evaluation of regulatory authority and potential for use
- 3) Database – USACE RIBITS Iowa Pilot – ensuring an easy to use electronic application submittal process
- 4) NRE placement –evaluation of NRE placement in rule or policy
- 5) Nutrient load reduction model – evaluation and implementation of a specific model or models for load reduction estimates."

**Comment:**

- In IDALS news releases regarding the INRS, the department quantifies the scope of the strategies implantation by providing a background section at the end of each release summarizing the number of projects, investments, etc. We suggest adding a similar summary to the executive summary, such as:

- The Iowa Water Quality Initiative was established in 2013 to help implement the Nutrient Reduction Strategy, which is a science and technology-based approach to achieving a 45 percent reduction in nitrogen and phosphorus losses to our waters. The strategy brings together both point sources, such as municipal wastewater treatment plants and industrial facilities, and nonpoint sources, including farm fields and urban stormwater runoff to address these issues.

The Initiative seeks to harness the collective ability of both private and public resources and organizations to deliver a clear and consistent message to stakeholders to reduce nutrient loss and improve water quality.

The initiative is seeing some exciting results. This fall, 2,800 farmers invested an estimated \$9 million in funding to match \$5 million in state cost share funds to adopt cover crops, no-till or strip till, or use a nitrification inhibitor when applying fall fertilizer. Participants include more than 1,000 farmers using a practice for the first time and nearly 1,800 past users who are trying cover crops again and are receiving a reduced rate of cost share.

A total of 64 demonstration projects are currently located across the state to help implement and demonstrate water quality practices. This includes 14 targeted watershed projects, seven projects focused on expanding the use and innovative delivery of water quality practices and 43 urban water quality demonstration projects.

More than \$420 million in funding has been documented for efforts in support of the Iowa Nutrient Reduction Strategy last year. This represents a \$32 million increase of funding in support of Iowa water quality programs and conservation efforts over the previous year.

**Response:** Partly in response to this comment, the preface that has been added to the Annual Report provides context on the key role of demonstration watershed projects in implementing the NRS in local areas throughout the state.

**Comment:**

- a. The inputs section **MUST** include (and should lead with) information about passage of [Senate File 512](#), the most significant water quality legislation since the Iowa Groundwater Protection of 1987. The annual report's executive summary must note that Senate File 512 was approved with bipartisan support by the Iowa House on January 23, 2018 (during the INRS annual report's covered reporting period). It was signed by Governor Reynolds on January 31, 2018. Senate File 512 provides long-term dedicated funding to support the Iowa Nutrient Reduction Strategy. The bill provides \$270 million in new state funding over the next 11 years to the plan's implementation, in addition to the current annual appropriations for the INRS, water quality and soil conservation. Senate File 512 promotes and incentivizes watershed collaboration, expands opportunities for communities to work together on watershed projects, and will allow farmers to scale up investments in edge-of-field and in-field conservation practices. More detail should be provided in the body of the annual report, such as the following:

- i. Senate File 512 prioritizes existing state funds to create a long-term, sustainable funding source to supplement Iowa farmers' own investments to improve water quality and reduce soil loss. Senate File 512 language was originally developed and passed by the House in 2016, and slightly modified and passed by the Senate in 2017. The bill passed the House with a bi-partisan vote of 59-4, and was the first bill signed by Governor Reynolds during the 2018 legislative session. The bill directs existing funds raised from gambling revenues towards edge-of-field and in-field infrastructure, as well as fees Iowans already pay on their water bills towards wastewater and drinking water facilities. Senate File 512 dedicates a total of \$270 million in new money over the next 11 years, on top of what is already being appropriated in other water quality and soil conservation programs. The \$270 million in new money is distributed as follows: \$141 million to nonpoint (ag land) efforts to fund edge-of-field and in-field conservation practices, and more than 129 million for point source efforts, including a grant program, a revolving loan fund, urban conservation, and watershed projects that benefit both point source (urban/city/industrial) and nonpoint source efforts.
- b. Adjusting the report's reporting period to match the state fiscal year will allow for inclusion of SF 512's 2019 resources of \$2 million for point source and nonpoint sources to be more directly highlighted.

**Response:** As stated above, the SF 512 is reported as an "anticipated funding source" in the Annual Report. Because the bill was signed after the end of the official 2018 NRS Reporting Period, the SF512 will be featured in more detail in the 2019 Annual Report.

**Comment:** The first bullet point should more directly highlight the state investment in the INRS.

**Response:** This suggestion will be explored further for the 2019 Annual Report. Reporting public funding in categories of state and federal programs will add valuable context. Existing data sources on NRS funding will be examined to form these categories.

**Comment:** This is also a section where you can highlight the shift in focus to nitrogen reduction practices based on the historical success of the phosphorus reduction benefits associated with soil conservation practices (such as in the first bullet point in the LAND section).

**Response:** A detailed comparison of the focus on practices that reduce loss of nitrogen, phosphorus, or both nitrogen and phosphorus is described on page 56 of the Annual Report. Assessment of the financial investment associated with these categories of practices is underway.

**Comment:** Taking credit for annual CRP payments – or at least highlighting these in the executive summary – seems inappropriate. Unless these are new federal contracts and the annual payments can be directly tied to promotions of a state INRS demonstration or implementation project, they should not be highlighted in the executive summary. Keep the focus on the inputs, activities and programs of the INRS.

**Response:** The retirement of row crop acres is an effective nutrient reduction practice that is included in the NRS, and the Conservation Reserve Program represents a substantial annual investment in federal funding devoted to row crop retirement. Annual CRP funding is highlighted in order to determine the change in this investment over time. In addition, CRP acres are incorporated as a measure of progress only in terms of the net change of acres—not total acres—since 2011 (the year following the 2006-2010 benchmark load calculations). Currently, CRP acres are used as a metric of row crop land retirement due to the fact that the data are readily available, but efforts are underway to estimate Iowa’s overall row crop land retirement using other data sources, such as satellite remote sensing.

**Comment:** We suggest some additional explanation is needed to understand the context of the permit and feasibility study numbers noted in the point source highlight. What does a permit do? What is a feasibility study? What is the scope of the investments made by the cities and industries that met their nitrogen and phosphorus removal targets? What is the scope of the investments needed in their feasibility studies? Numbers help put these otherwise rather generic descriptions in better context.

**Response:** Thanks for these suggestions. While some of these concepts are documented in the NRS itself, we agree that additional explanation and information are needed to understand the progress being made by point sources. We are working to provide this type information in future annual reports.

**Comment:** In the Executive Summary—“Outreach events were conducted in at least [as it was likely more] 92 counties in the 2018 reporting period. [How did this number change vs. last year?] In the latest reporting period, partner organizations reported 511 events [How did this number change vs. last year?] with 45,800 total attendees, a slight decrease in attendance compared to the previous year.” – Don’t focus only on numbers that decreased.

**Response:** This section of the Executive Summary was adjusted to clarify the changes in the number of events.

**Comment:** In the Executive Summary—What are the overall knowledge and awareness results (percentages) from the surveys?

**Response:** The section of the Executive Summary that highlights these survey results aims to capture the overall trends that are seen in different regions of the state. For succinctness, specific percentages were excluded, because these values vary substantially across the state. Region-specific reports are summarized in the Annual Report (pages 28 to 31) and the full reports will be available at [www.nutrientstrategy.iastate.edu](http://www.nutrientstrategy.iastate.edu) in the coming months.

**Comment:** What is the source for the bullet point on installations of structural practices trends? Is this the BMP mapping project? If so, it needs a bit more explanation and context.

**Response:** These trends were determined using cost-share program data. Additional explanation is provided on pages 38 to 42.

**Comment:** There should be a bullet point on the initial results from the BMPS mapping project in this section.

**Response:** The initial results of the BMP Mapping Project represent a cross-sectional total of structural practices that existed in the 2007-2010 time period. Because the Annual Report aims to report change in practice use over time, the Executive Summary does not feature these results. The BMP Mapping Project will allow for estimates of practice implementation that occurred between 2010 and 2016, but these data are not yet available.

**Comment:** As per our first general statement at the top of this email, the baseline annual loads bullet point must have some additional results and context, such as:

- i. To develop the strategy in 2010-12, ISU estimated phosphorus and nitrate-N loads using information from the 2006-2010 time period. This period was used due to the availability of data and the need to develop the plan's cost estimates. However, the 2008 Gulf of Mexico Action Plan states that reductions "...measured against the average load over the 1980-1996 time period may be necessary." Therefore, Iowa State University calculated phosphorus and nitrate-N loads from Iowa over this longer baseline period in a manner consistent the plan's original estimate, and consistent with the federal government requirement and other states' plans. The average calculated phosphorus load for the new 1980-96 time baseline period was 21,436 tons, compared to 16,800 tons reported in the strategy. This is a 22% reduction in the phosphorus load from the required 1980-1996 federal baseline period to the time immediately before the INRS was initiated. Reduced P loads were primarily due to fewer acres under intensive tillage and a significant increase in no-till acreage over the period. The average nitrate-N load for the 1980-96 period was estimated to be 292,022 tons, compared to 307,449 tons reported in the strategy, an estimated 5% increase from the baseline period to when the strategy was written. Increased N loads over this period were primarily due to the steady-slightly increasing corn/soybean acres and continuous corn acreage, and N application rate. The lessons learned from successful soil conservation programs and associated phosphorus reductions are now being applied to Iowa's newer edge-of-field nitrogen reduction practices and structures.

**Response:** The context surrounding the baseline annual load estimates is provided in the Introduction of the Annual Report (page \_\_\_\_). The preface that has been added to the Annual Report discusses this topic further, to add context at the start of the report.

**Comment:** The water quality sensor item needs additional context. Citizens need information that describes how these sensors are indicative of event or seasonal fluctuations, not of long-term results from the implementation of the INRS. This is one item that could be linked to the DNR's August 2016 report on monitoring for the INRS ([Stream Water-Quality Monitoring Conducted in Support of the Iowa Nutrient Reduction Strategy](#)).

**Response:** Extensive context about the challenges associated with detecting trends from monitoring data is provided on page 9 of the annual report; these descriptions are summarized from the report that

is referenced in the above comment. Additional context and discussion is included in the preface that has been added to the Annual Report.

**Comment:** The final bullet point on estimating Iowa's annual nitrogen export in this executive summary section seems to conflict with the above item on estimating the annual baseline loading. These methods are not complete nor have they or their results been reviewed by NGOs. As has been your practice for the other annual reports, until the project is final and reviewed by others, it should not be included in the annual report. These methods will need further administrative leadership and partner review and discussion for their proper context.

**Response:** As described on pages 51 to 53 of the Annual Report, the NRS called on the DNR to convene a technical work group to define a process for estimating annual nutrient loads. The process that was developed by the work group is the best available method at this time, and the research associated with this work has been peer-reviewed for publication in the *Journal of Soil and Water Conservation*.



## IOWA CHAPTER

November 23, 2018

Laurie Nowatzke  
Lwissler@iastate.edu

Re: Draft Report – Progress of the Iowa Nutrient Reduction Strategy

Dear Laurie:

On behalf of the Iowa Chapter of the Sierra Club, I am offering the following comments on the draft report “Progress of the Iowa Nutrient Reduction Strategy”

### **The Scope of the Problem**

Earlier in 2018, scientists were predicting the dead zone in the Gulf of Mexico would be about the size of the state of Connecticut, three times larger than the target set by the Interagency Mississippi River and Gulf of Mexico Hypoxia Task Force.<sup>1</sup> A major study, released in the spring of 2018, titled “Iowa stream nitrate and the Gulf of Mexico” by Christopher S. Jones, Jacob K. Nielsen, Keith E. Shilling, and Larry J. Weber lays out the contribution Iowa makes to the dead zone in the Gulf of Mexico. To summarize the results of the study:<sup>2</sup>

- Three major watershed basins drain into the Gulf of Mexico – Mississippi-Atchafalaya Basin, Upper Mississippi River Basin, and the Missouri River Basin.
- Iowa contributes an average of 29% of the nitrate load to the Upper Mississippi Basin.
- Iowa contributes an average of 45% of the nitrate load to the Missouri River Basin.
- Iowa contributes an average of 55% of the nitrate load to the Mississippi-Atchafalaya Basin.
- Since 1999, nitrate loads in the Iowa-inclusive basins have increased.
- The increases in nitrate loads do not appear to be driven by changes in discharge and cropping intensity unique to Iowa.
- The 5-year running annual average of Iowa nitrate loading has been above the 2003 level for ten consecutive years.
- A comparison of the water flowing off Iowa’s landscape into the three basins affecting the dead zone in the Gulf of Mexico indicates that Iowa is a relatively small contributor to the overall quantities of water flowing into the major water basins. At the same time the contribution to the nitrate-nitrogen load is significantly higher than the lower levels of water flowing into the basin and the overall land area in the basin.

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<sup>1</sup> Press release, “Average-size Dead Zone Forecasted for the Gulf of Mexico”, United States Geological Survey, June 7, 2018, available at [www.usgs.gov/news/average-sized-dead-zone-forecasted-gulf-mexico](http://www.usgs.gov/news/average-sized-dead-zone-forecasted-gulf-mexico)

<sup>2</sup> Christopher S. Jones, Jacob K. Nielsen, Keith E. Shilling, and Larry J. Weber, “Iowa stream nitrate and the Gulf of Mexico”, PLOS One, April 12, 2018. Available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0195930>

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River basin	Iowa's contribution to water in the basin	Iowa's contribution to the nitrate-nitrogen load in the basin	Iowa's land area in the basin
Mississippi-Atchafalaya River Basin	5.9%	29%	4.5%
Upper Mississippi River Basin	21.0%	45%	21.0%
Missouri River Basin	12.0%	55%	3.3%

- The goals of reducing the dead zone in the Gulf of Mexico will be very difficult to achieve if nitrate retention cannot be improved in Iowa.<sup>3</sup>

Clearly Iowa is playing an outsized role in contributing to the dead zone in the Gulf of Mexico. It also means that Iowa must play a significant role in reducing nutrients in our waterbodies.

#### Comments on the draft "Progress Report"

This draft "Progress Report" shows the efforts that have been made toward implementing strategies that are reducing and will reduce nutrients in Iowa's waters.

However, the report is glaring in what it is not showing. What is missing is a report of the reduction in nutrients in Iowa's water bodies. It is impossible to tell from this report if the nutrients are really being reduced. The taxpayers have been spending a lot of money, albeit not enough, on nutrient reduction. If the money spent is being spent on the wrong things, then the overall reduction will not be happening. Quite frankly, this report feels like it is papering over the truth about Iowa's nutrient reduction.

The United States Geological Society estimated that the levels of nitrate loads in May, 2018, were 13% below the long-term average and the phosphorus loads were 10% above the long-term average.<sup>4</sup> The May figures are significant because the water discharged in May is one of the factors that determines the size of the dead zone in the Gulf of Mexico. How do Iowa's nutrient loads figure into the May, 2018, totals?

Iowa is a significant contributor to the dead zone in the Gulf of Mexico. Is Iowa's contribution going down, staying the same, or increasing? This needs to be stated clearly. Page 4 of the draft "Progress Report" indicates that a methodology to estimate nitrogen exports has been developed and that the methodology for phosphorus will be able to report the 2018 numbers, along with pages 7 and 8 that report the changes up to 2010.

We encourage the "Progress Report" to be expanded to include a review of the monitoring for each watershed that has a nutrient sensor. The graphs could record the range between the low and high levels of nutrients detected in the water, showing the range for each year that has been monitored. Obviously, nutrient levels found in rivers and streams will vary from year to year, with extremes being very wet years and very dry years. However the overall trend should be downward, if nutrient reduction techniques have been successful.

This report is making no mention of the numbers of beaches that were closed in 2018, comparing this year with prior years. The beaches are closed when bacteria levels reach ranges that are harmful to human health. The beach closings are directly related the nutrients entering the state's water bodies, in that the nutrients encourage algae growth, which leads to the growth of bacteria, and also leads to the production of microcystin toxins.

<sup>3</sup> Besides the Jones study, see "Iowa's Poor Water Quality Goes South", On Point, WBUR radio, July 16, 2018, [www.wbur.org/onpoint/2018/07/16/iowa-water-pollution](http://www.wbur.org/onpoint/2018/07/16/iowa-water-pollution)

<sup>4</sup> Press release, "Average-size Dead Zone Forecasted for the Gulf of Mexico", United States Geological Survey, June 7, 2018, available at [www.usgs.gov/news/average-sized-dead-zone-forecasted-gulf-mexico](http://www.usgs.gov/news/average-sized-dead-zone-forecasted-gulf-mexico)

Although 88% of Iowa's land drains to a location with a water quality sensor, the remaining 12% of the land needs to be monitored for nutrient levels (see page 3 of the draft "Progress Report"). There is no plan presented in this report to increase the number of sensors installed across the state.

This report does not mention the loss of funding to the Leopold Center for Sustainable Agriculture. The Leopold Center's research was valuable in reviewing strategies that reduce soil loss and nutrient loss from the working landscape. On-going funding is necessary to work toward significant break-throughs. The Leopold Center should be a significant part of the team working on nutrient reduction research.

The "Progress Report" also needs to lay out the problem of nitrates in Iowa's drinking water. On July 17, 2018, Greenfield, Iowa, residents were told to avoid drinking the city's water after an algae bloom in its water source - Lake Greenfield.<sup>5</sup> Ultimate testing showed no harmful toxins in the drinking water.<sup>6</sup> During the summer of 2018, the University of Iowa Water Plant installed a reverse-osmosis system that will remove nitrates from drinking water. The water plant draws its water from the Iowa River. At times, that water became so high in nitrates that it was diluted with well water.<sup>7</sup> The Des Moines Water Works uses an ion exchange process to remove nitrates from its drinking water.<sup>8</sup> The Water Works first installed nitrate-removal equipment in the 1990s.<sup>9</sup> The Water Works pulls its drinking water from the Raccoon River and from the Des Moines River, both which periodically reach high levels of nitrates.

If we want to get serious about nutrient reduction, the Iowa Department of Natural Resources needs to set nutrient criteria for every river, stream, and lake in the state, including a reasonable date for each water body to meet the standards. Numerical standards provide a target to meet. If you don't have a measurable target, you don't know if you are hitting the target or if you need to continue working on improvements. The report should highlight the need for nutrient criteria.

The efforts in Iowa need to be increased exponentially. The financial expenditures advanced toward solving the nutrient reduction strategies need to be increased significantly. This report should highlight a need for more money to be invested across the state.

Sincerely,

Pamela Mackey Taylor  
Director

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<sup>5</sup> "Bottled Water Advisory Issued for Greenfield After Water System Potentially Contaminated", *WHO TV*, July 17, 2018

<sup>6</sup> Mike Peterson, "Greenfield water situation improving", *KMA Radio*, July 20, 2018

<sup>7</sup> Julia Poska, "UI Water Plant to target nitrate with reverse osmosis", *The Daily Iowan*, July 30, 2018

<sup>8</sup> <http://www.dmww.com/water-quality/treatment-process/>

<sup>9</sup> Clay Masters, "Iowa's Nasty Water War, Des Moines' lawsuit against farming counties is about more than just pollution", *Politico Magazine*, January 21, 2016

## Responses to comments from representatives of the Sierra Club Iowa Chapter

Thank you for your feedback and questions regarding the content of the Annual Report. The following remarks aim to address each point that you have raised.

Under the header, “Comments on the draft ‘Progress Report’”, the second paragraph states that a report of reduction in nutrient in Iowa’s water bodies is missing from the Annual Report. Individual water bodies across Iowa are monitored annually for nitrate concentrations, turbidity, and additional parameters. The Annual Report aims to summarize the extent of these efforts (see pages 51 to 53 of the report) and provides a summary of statewide nutrient loads. The Iowa Nutrient Reduction Strategy called for the development of methods for estimating annual nitrate-N and phosphorus loads; a method for estimating annual statewide nitrate-N loads has been developed and the corresponding results are reported on page 51. A method for estimating annual phosphorus loads is under development and will likely be reported beginning in 2019.

The fourth paragraph under the “Comments” heading asks whether Iowa’s contribution to the Gulf of Mexico hypoxic zone is increasing, staying the same, or decreasing. As stated above, there are ongoing efforts to estimate Iowa’s annual nitrate-N and phosphorus loads using data from the state’s water monitoring network. Over time, these annual estimates will provide long-term time series that will aid in trend assessments; however, at this time, reliably detecting trends from the available data points is problematic, partly due to the large effect that streamflow has on nutrient loading (see figure 27 in the Annual Report). Annual nitrate-N estimates will continue to be reported and evaluated, while phosphorus load estimates will be developed for similar evaluation.

The fifth paragraph makes the suggestions for including a review of the monitoring for each watershed that has a nutrient sensor. This work is outside the scope of the Annual Report, which aims to summarize the work that is conducted across Iowa and report annual statewide nutrient loads.

The sixth paragraph states that the report excludes information about beach closures caused by harmful algal blooms. This topic is also currently outside the scope of the Annual Report; the Annual Report centers on efforts related to nutrient reduction and reports annual statewide nutrient loads. That stated, harmful algal blooms are taken seriously as an ongoing environmental impact in Iowa, and beach closures are tracked and reported through other programs.

The seventh paragraph recommends that the remaining 12% of Iowa’s land be monitored for nutrients. Iowa’s ambient water monitoring network is continually evaluated, and formal strategies for the monitoring network are developed every five years. According to the Iowa Department of Natural Resources, there were 8 real-time nitrate sensors in Iowa at the time that the Iowa Nutrient Reduction Strategy began. There are now 70 real-time nitrate sensors in Iowa, and it is estimated that these account for approximately one-third of the real-time nitrate sensors deployed nationwide. In addition, a statewide network of turbidity sensors has been deployed and will aid efforts to estimate annual phosphorus loads.

The eighth paragraph states that the report does not mention the loss of funding to the Leopold Center for Sustainable Agriculture. The Annual Report aims to summarize the ongoing research conducted on the nutrient reduction capacities of agricultural practices (pages 16 to 17). Projects related to nutrient reduction that were previously funded by the Leopold Center were transferred to the Iowa Nutrient Research Center so that researchers could continue that work. These projects, among others, are incorporated into the overall summary of research funded by the INRC (pages 16 to 17).

The ninth paragraph states that the report should address the problem of nitrate in Iowa's drinking water. The Iowa Nutrient Reduction Strategy calls for the development of plans to reduce nutrients in Iowa sourcewater. Efforts to address this issue are reported on page 22 of the Annual Report.

The tenth paragraph states that the report should highlight the need for nutrient criteria. The NRS emphasizes implementation of technology-based nutrient reductions in the near term, with continued assessment and development of suitable nutrient criteria as a long-term goal. Progress on the assessment and development of nutrient criteria can be found on pages 57 to 58 of annual report.

The eleventh paragraph suggests that the need for more funding be highlighted in the report. A thorough discussion of existing funding and the remaining challenges associated with funding limitations is provided on pages 9 to 12 of the annual report. However, partly in response to this comment, a preface to the Annual Report has been added to provide context at the front of the report concerning funding availability, as well as other topics.