

US EPA ARCHIVE DOCUMENT

Guidance on Reporting Watershed Improvement under Measure SP-12 [same as WQ-32 in FY 2007]

August 2007
Revised January 2008

Measure Text

By 2012, improve water quality conditions in 250 impaired watersheds nationwide using the watershed approach (cumulative). (2002 baseline: 0 watersheds improved of an estimated 4,767 impaired watersheds of focus having one or more water bodies impaired. The watershed boundaries for this measure are those established at the "12-digit" scale by the U.S. Geological Survey [USGS]. Watersheds at this scale average 22 square miles in size. "Improved" means that one or more of the impairment causes identified in 2002 are removed for at least 40 percent of the impaired water bodies or impaired miles/acres, or there is significant watershed-wide improvement, as demonstrated by valid scientific information, in one or more water quality parameters associated with the impairments.)

Type

Targeted Measure

Who Reports in ACS

Regions

Introduction

This measure will establish and demonstrate a capacity for watershed-scale restoration and protection throughout the country using the "watershed approach." It is not designed to be a measure of what portion of the 12-digit watersheds in the country have improved or meet water quality standards. See below for a description of how the program will focus its attention on these watersheds.

Definitions

Watershed means (a) a watershed or hydrologic unit at the 12-digit scale, as determined by the draft or final Watershed Boundary Dataset (WBD), or (b) a regionally defined hydrologic unit of appropriate scale. Option (b) is provided since some waters, such as coastal and estuary waters, fall outside the WBD, and may or may not be hydrologically definable at a scale comparable to inland HUC-12s. Although watersheds or hydrologic units at the 12-digit scale are technically termed "sub-watersheds" by USGS, the Strategic Plan will use the term "watershed" for simplicity. There is a universe of approximately 160,000 12-digit watersheds in the United States.

An *impaired watershed* is a watershed containing one or more impaired water bodies.

Impaired water bodies are those identified by states and EPA in the baseline for measure SP-10.

Watershed approach is a coordinating process for focusing on priority water resource problems that:

- Is focused on hydrologically defined areas,
- Involves key stakeholders,
- Uses an iterative planning or adaptive management process to address priority water resource goals, and
- Uses an integrated set of tools and programs.

Functionally, the watershed approach is a problem-solving tool for protecting water quality and aquatic resources. It recognizes that factors affecting the health of our nation's waters should be understood within their watershed context. It includes assessment of relevant watershed processes and socioeconomic factors, identification of priority issues and most promising corrective actions, involvement by affected parties throughout the process, and implementation at the required scale.

Improved means either that:

- One or more of the waterbody/impairment causes identified in 2002 are removed, as reflected in EPA-approved state assessments, for at least 40% of the impaired water bodies or impaired stream miles/lake acres in the watershed; OR
- There is significant watershed-wide improvement, as demonstrated by valid scientific information, in one or more water quality parameters or related indicators associated with the impairments.

Watersheds of focus are watersheds in which Regions and states will be focusing application of the watershed approach to attain this measure. Regions and states have identified an estimated 4,767 watersheds of focus. Regions and states will maintain lists of the watersheds of focus. The watersheds of focus include watersheds that may be amenable to water quality improvement in the near term (five years), as well as watersheds where improvement may take much longer. In many cases, the time frame cannot be predicted without more information gathered for watershed planning. EPA envisions flexibility in identifying the watersheds of focus over time. EPA and the states may add, change, or remove watersheds they are focusing on as new information becomes available or as resources are reallocated. The measure thus envisions "living" lists of watersheds.

Overview of Implementation

This guidance provides information needed for states and EPA to implement the measure. For a watershed to be counted under SP-12, the state and Region must demonstrate that the watershed approach was applied, and that water quality improved. Either Option 1, Option 2a, or Option 2b described below may be used for demonstrating water quality improvement.

Supporting information should be provided using the appropriate attached template. A separate template is available for each reporting option below (1, 2a, or 2b).

An individual watershed may be counted only once under this measure. That is, a watershed may be counted only when it initially meets the definition. Subsequent actions, such as having additional impairment causes removed or additional water quality parameters showing watershed-wide improvement, would not enable the watershed to be counted again in a subsequent reporting period.¹

Demonstrating Use of the Watershed Approach

This measure requires a demonstration that the watershed approach was utilized and helped lead to the water quality improvement being recognized. One of the primary objectives of this measure is to demonstrate and model the watershed approach by linking the activities of key partners in a manner that results in sustainable watershed management and improved water quality at the watershed scale.

For the purposes of this measure, Regions will provide the following information to demonstrate that the watershed approach, as defined in the Definitions section above, was used to help achieve the water quality improvement reported:

- Information identifying the HUC-12 or regionally defined watershed(s) in which the watershed approach was applied;
- Information identifying the stakeholders involved and their roles in applying the watershed approach to achieve the water quality improvements reported;
- Information describing the watershed plan that was developed and how it was implemented to achieve the water quality improvements reported. Note that the watershed plan may be a comprehensive plan, for example, one that contains the nine elements of a NPS program watershed plan. It may also be a less rigorous planning or adaptive management approach that is scaled to address the problem(s) affecting waters within the watershed. It should, however, clearly demonstrate problem identification and prioritization, stakeholder involvement, integrated application of the voluntary and regulatory tools and programs available to correct the

¹ EPA may revisit this approach when the EPA *Strategic Plan* is revised in 2009 for the 2009-2014 period.

problem, outcome objectives, and a monitoring/assessment approach to assess improvement and identify appropriate adjustments.

The above information need not be lengthy, but should provide the minimum detail needed for understanding by a general audience.

Guidance for Option 1 – Reporting Watershed Improvement Based on Impairment Removal

"Improved" means that one or more of the impairment causes identified in 2002 are removed for at least 40 percent of the impaired water bodies or impaired miles/acres

Option 1, corresponding to the first definition of improvement under this measure, in italics above, is designed to track watershed improvements based on removal of waterbody/impairment causes in subsequent EPA-approved 303(d) lists and Integrated Reports. It is based on existing state reporting to EPA. It is perhaps the most rigorous of the three options.

Removal of an impairment cause for a waterbody in the 2002 baseline must be demonstrated in a post-2002 EPA-approved 303(d) list or Integrated Report. Water impairment causes that are moved off the 303(d) list or Integrated Report for one of the following two reasons can be counted toward meeting this measure:

1. Waterbody/impairment cause(s) removed because of restoration activities
2. New monitoring data show waterbody/impairment cause(s) removed; reason for recovery unspecified

Water impairment causes that are moved off the 303(d) list or Integrated Report for any of the following four reasons cannot be counted toward meeting this measure:

3. Original basis for 303(d) listing is incorrect; waterbody/impairment cause(s) removed
4. Change in water quality standards assessment methodology, waterbody/impairment cause(s) removed
5. Water originally listed as threatened but has continued to meet water quality standards for specified waterbody/impairment cause(s) and is no longer considered threatened
6. Change in water quality standards; data show that water meets new water quality standards; waterbody/impairment cause(s) removed

The Region must demonstrate that the removal of impairment causes meets the 40% threshold. That is, one or more of the waterbody impairment causes identified in 2002 are removed, as reflected in EPA-approved state assessments, for at least 40% of the impaired water bodies or impaired stream miles/lake acres in the watershed. A Region may report on the basis of either the number of waters or the miles/acres that

those waters represent. The Region must provide the following information from EPA-approved state 303(d) lists or Integrated Reports:

- The baseline condition, i.e., the number (or miles/acres) of waters in the watershed listed in 2002; and
- The improved condition, i.e., the number (or miles/acres) of waters in the watershed for which one or more impairment causes are removed.

The following examples illustrate how a watershed could meet the 40% threshold under Option 1:

- A watershed has 5 segments listed as impaired for impairment cause A, none listed for impairment cause B. In 2008, 2 of the 5 are restored for A and removed from the 303(d) list. Thus, 2 out of 5 segments (40%) have an impairment cause removed.
- A watershed has 5 segments listed as impaired, 2 for A and 3 for B, no segments listed for both A and B. In 2008, 1 of the segments listed for A and 1 of the segments for B are restored and removed from the 303(d) list; all other segments remain on the list. Thus, 2 out of 5 segments (40%) have any cause removed.

The following example illustrates a watershed that would not meet the 40% threshold in Option 1:

- A watershed has 5 segments listed as impaired, 2 for A and 3 for B, no segments listed for both A and B. In 2008, 1 of the segments listed for A is restored and removed from the 303(d) list; all other segments remain on the list. Thus, only 1 of 5 segments (20%) has any cause removed.

Note that for the purposes of this measure we track changes against only the 2002 baseline condition. For example, if a waterbody that was 303(d)-listed in 2002 for a particular impairment is removed from a subsequent list for either of the two reasons above as a result of the watershed approach, it may be counted for this measure. In contrast, if a waterbody that was originally 303(d)-listed after 2002 for a particular impairment is removed from a subsequent list, it may not be counted for this measure. For example, if an impairment cause is initially identified in a particular waterbody in 2004 and subsequently restored in 2010, it may not be counted for this measure. Similarly, a waterbody that is initially listed for an impairment cause after 2002 does not count in the baseline when determining if the 40% threshold is achieved for improvement for that impairment cause in the watershed.

Guidance for Option 2 – Reporting Watershed-wide Improvement

Improved means there is significant watershed-wide improvement, as demonstrated by valid scientific information, in one or more water quality parameters associated with the impairments.

Option 2, corresponding to the second definition of improvement under this measure, in italics above, provides an alternative reporting mechanism for demonstrating progress at the watershed scale. It is designed to use water quality monitoring data to track improvements occurring across the watershed that have not yet resulted in an impairment cause being removed.

Watershed-wide means that the monitoring design is representative of spatial variability within the watershed appropriate to the water quality listing(s) within the watershed and the selected parameter(s), loadings or indices. Examples of monitoring designs that might be appropriate depending on the issue being addressed include statistically valid, watershed-scale results (e.g. census or probability-design), watershed outlet (pour point) monitoring to capture cumulative impacts, or spatially distributed sampling considered to be representative of the watershed by the State and Regional office. Documentation for the improvement would need to explain how the monitoring design is representative.

Valid scientific information means that information supporting watershed-wide improvements is based on objective, accepted monitoring and assessment approaches. The monitoring/assessment process includes adequate documentation of data, observations, and method of investigation sufficient to allow for independently reproducible results (such as information covered in quality assurance management plans). Data used in assessment are available either in an appropriate EPA database or other accessible formats (e.g., websites, published documents, technical memos, etc.)

To meet this second (Option 2) definition of improved, a watershed assessment must demonstrate evidence of a positive trend/change that accounts for a significant portion of the nonattainment gap for the key parameter(s)/indicator(s).

Parameters or related indicators refer to either:

- The specific parameters listed as causes of impairment on the 2002 303(d) list or Integrated Report. They are associated with waters that qualify under Categories 5, 4a, 4b, or 4c in the Integrated Report Guidance; or
- Parameters, loadings, and/or indices directly related to the designated use impairment (e.g., phosphorus loadings might be reduced to address a low dissolved oxygen listing).

One of the two following sub-options must be used to demonstrate watershed-wide improvement: using accepted statistical procedures, or evaluating and documenting multiple lines of evidence. The baseline for the trend or change may start as far back as 1992. The evidence must be supported by an analytical plan, and may be peer-reviewed within EPA.

Option 2a –Using statistical procedures to demonstrate that significant improvement has occurred with a 90 percent or greater level of confidence. For purposes of this measure, “statistical procedures” are those procedures capable of showing statistically significant change in the water quality parameters or related indicators (e.g., seasonal Kendall trend test, Wilcoxon sign rank). Supporting documentation should describe the environmental significance of any reported changes in water quality.

Option 2b – Using a multiple lines of evidence approach to demonstrate watershed improvement. A “multiple lines of evidence approach” means that the cumulative weight of several lines of evidence is used to assess whether a watershed-wide improvement has occurred. If, taken together, the amount and consistency of evidence are judged sufficient to indicate improvement, we will count this toward the measure. Evidence for Option 2b must include the following:

- A. Evidence of an improving trend in a water quality parameter (physical or chemical) based on empirical data which may or may not be statistically significant (e.g., descriptive statistics) but nevertheless supports improvement².

AND at least one of the following three lines of evidence

- B1. Evidence of an improving trend in a related biological indicator/index.
- B2. Evidence of an improving trend in water quality based on predictive/ modeled data, with field level ground truthing.
- B3. Evidence of widespread, significant load reductions.

AND

- C. Evidence of widespread nonpoint source or point source implementation, or other evidence of watershed implementation actions.

AND

- D. No evidence of significant deteriorating trends in related parameters as called for in the analytical plan. A lack of evidence (data) for other parameters identified in the analytical plan is not adequate to support this line of evidence.

To document watershed-wide improvement using the watershed approach, information must be made available to demonstrate how either Option 2a or 2b is met. If an improvement occurs in a parameter/indicator which the Region and State believe should be counted toward the measure but which differs somewhat from this guidance, an explanation must be provided in the documentation and agreed to by Headquarters.

Supporting documentation must also be provided to demonstrate that the improvement is watershed-wide, uses valid scientific information, and includes parameters or other indicators associated with the impairment (see definitions for these terms below). In addition, information provided must specifically identify:

- A clear written rationale that describes how a determination of improved water quality is supported – including the type, quality, and amount of

² For those impairments where a chemical or physical parameter is not relevant, such as invasive species, this line of evidence can be met by showing an improvement in the biological indicator. Information must accompany the documentation explaining why chemical/physical parameter(s) are not relevant and why the specific biological indicator was chosen.

environmental data, and decision criteria. The rationale must identify the specific parameters used to assess improvements, and must also describe the efforts made to locate and analyze any evidence of deteriorating trends in these or related parameters. Sufficient information must be provided to give readers an understanding of the approach used to assess data, but the level of detail may vary. Relevant information may be found in state-wide quality plans, standard operating procedures, project-specific quality assurance project plan, or other analogous forms. Other information may be written to describe how data were used or to document the analyses performed that demonstrate improved water quality.

- A description of the problem and the link to the impairment causes identified in 2002,
- Data used in the assessment, and
- The results which demonstrate improvement.

Results and documentation must be reviewed and accepted by the Regional office. The results and documentation for at least one submission from each Region will be peer reviewed by an EPA panel consisting of at least two reviewers from Regions other than the reporting Region, and at least one reviewer from EPA Headquarters. Response to the peer review must accompany the documentation. The peer review panel will recommend whether to accept the watershed(s) to be counted, and may develop recommendations for improving the measure definition to ensure consistency. Regional consistency in reporting on the measure may also be ensured by periodic Headquarters audits of other submissions.

Reporting of Water Quality Data (supporting Options 2a and 2b)

Any water quality data developed to support Options 2a or 2b must be provided in a timely fashion into EPA's STORET warehouse, using the WQX data transfer protocol, or otherwise be made available in a STORET-compatible format. Data used to support the measure for which WQX-templates are still under development must be provided in a timely fashion once the WQX templates are completed.

Supporting water quality data are not needed if results are reported under Option 1.

EPA's intention would be to make the evidence for Options 2a and 2b available publicly in some form. In the future, EPA anticipates that the Watershed Assessment, Tracking & Environmental ResultS (WATERS) system will provide access for much of the information/data needed to support this demonstration of watershed-wide improvement.

Templates

Supporting information for results reported under measure SP-12 should be provided using the appropriate template on the following pages. A separate template is available for each reporting option described above (1, 2a, or 2b).

The template should be complete and provided to headquarters at any time results are reported to ACS. A Region may report results at mid-year and end-of-year before the template is completed, however, if the Region is reasonably assured that the watershed improvement qualifies under all criteria in this guidance, and if the template can be completed within 45 days of reporting.

Future Measure Improvements

EPA intends to further improve this measure in succeeding strategic plans to refine and expand incremental measures of water quality “improvement” in watersheds, and possibly to reflect maintenance of water quality.

Contact for More Information

- Christopher Zabawa, EPA’s Office of Wetlands, Oceans, and Watersheds, (202) 566-1222, Zabawa.christopher@epa.gov.
- Fred Leutner, EPA’s Office of Science and Technology, (202) 566-0378, Leutner.fred@epa.gov.

REPORTING WATERSHED IMPROVEMENT

Based on Impairment Removal (Option 1)

Watershed Identification

a Organization	<i>Name and type of organization reporting for the watershed</i>
b Point of Contact	<i>Name, title, address, telephone number and e-mail address of individual responsible for this report</i>
c Project Title	<i>Short descriptive title, e.g., "Reducing bacterial contamination in the Long Creek watershed, Indiana"</i>

Description of 2002 Baseline Condition

d Watershed(s)	<i>Enter list of one or more 12-digit HUC watersheds. Note: if 12 digit HUCs are not delineated, describe the regionally-defined watershed(s) of appropriate scale.</i>
e 2002 Impairments	<i>Enter HUC, waterbody ID, and impairment cause</i>
	<i>Enter HUC, waterbody ID, and impairment cause</i>
	<i>Enter HUC, waterbody ID, and impairment cause</i>
	<i>Additional lines as needed</i>
f Map (optional)	<i>Attach map(s) showing watershed(s) and impaired waterbodies</i>

Evidence of Watershed Approach

g Area of Effort	<i>Describe geographic area - may be larger than the watershed(s) with documented improvement</i>
h Stakeholders Involved and Their Roles	<i>Identify partners responsible for planning and implementation. Describe each partner's role.</i>
i Watershed Plan	<i>Description of, or reference to, a watershed plan that identifies problems and proposes solutions to implement</i>
j Restoration Work	<i>Describe BMPs or other actions taken to improve watershed condition. Should provide a clear, succinct summary in plain language understandable to the general public. Avoid technical terms without a plain language description or definition (or photo) that demonstrates the meaning.</i>

Evidence of Impairment Removal

k Impairments Removed	<i>List waterbody IDs sufficient to demonstrate that one or more impairment causes identified in 2002 (see "e" above) have been removed from at least 40% of the impaired waterbodies or impaired miles/acres in the watershed. Include the date of the state WQ assessment that reported the impairment removal. Include the date of the IR or approved 303(d) list that reflects the removed waterbodies.</i>
l Photos/Graphics (optional)	<i>Attach available photos or graphics, with captions, illustrating the local problem or project, and results.</i>

Refer to "Guidance on Reporting Watershed Improvement under Measure SP-12" for more complete descriptions of information requested in this template.

REPORTING WATERSHED IMPROVEMENT

Based on Statistical Evidence of Watershed-wide Improvement (Option 2a)

Watershed Identification

a Organization	Name and type of organization reporting for the watershed
b Point of Contact	Name, title, address, telephone number and e-mail address of individual responsible for this report
c Project Title	Short descriptive title, e.g. "Reducing bacterial contamination in the Long Creek watershed, Indiana"

Description of 2002 Baseline Condition

d Watershed(s)	Enter list of one or more 12-digit HUC watersheds. Note: if 12 digit HUCs are not delineated, describe regionally-defined watershed(s) of appropriate scale.
e 2002 Impairments	Enter HUC, waterbody ID and impairment cause
	Enter HUC, waterbody ID and impairment cause
	Enter HUC, waterbody ID and impairment cause
	Additional lines as needed
f Map (optional)	Attach map(s) showing watershed(s) and impaired waterbodies

Evidence of Watershed Approach

g Area of Effort	Describe geographic area - may be larger than the watershed(s) with documented improvement
h Stakeholders Involved and Their Roles	Identify partners responsible for planning and implementation. Describe each partner's role.
i Watershed Plan	Description of, or reference to, a watershed plan that identifies problems and proposes solutions to implement
j Restoration Work	Describe BMPs or other actions taken to improve watershed condition. Should provide a clear, succinct summary in plain language understandable to the general public. Avoid technical terms without a plain language description or definition (or photo) that demonstrates the meaning.

Evidence of Watershed-wide Improvement

k Impairments Removed (if applicable)	List waterbody IDs where one or more impairment causes identified in 2002 have been removed, if any. Include the date of the IR or approved 303(d) list that reflects the removed waterbodies.
l Statistical Results	Summarize statistical analysis demonstrating that significant improvement has occurred with a 90 percent or greater level of confidence. See guidance.
m Environmental Significance	Relate statistical results to goals of the watershed plan
n Photos/Graphics (optional)	Attach available photos or graphics, with captions, illustrating the local problem or project, and results.

Refer to "Guidance on Reporting Watershed Improvement under Measure SP-12" for more complete descriptions of information requested in this template.

REPORTING WATERSHED IMPROVEMENT

Based on Multiple Evidence of Watershed-wide Improvement (Option 2b)

Watershed Identification

a Organization	Name and type of organization reporting for the watershed
b Point of Contact	Name, title, address, telephone number and e-mail address of individual responsible for this report
c Project Title	Short descriptive title, e.g. "Reducing bacterial contamination in the Long Creek watershed, Indiana"

Description of 2002 Baseline Condition

d Watershed(s)	Enter list of one or more 12-digit HUC watersheds. Note: if 12 digit HUCs are not delineated, describe regionally-defined watershed(s) of appropriate scale.
e 2002 Impairments	Enter HUC, waterbody ID and impairment cause
	Enter HUC, waterbody ID and impairment cause
	Enter HUC, waterbody ID and impairment cause
	Additional lines as needed
f Map (optional)	Attach map(s) showing watershed(s) and impaired waterbodies

Evidence of Watershed Approach

g Area of Effort	Describe geographic area - may be larger than the watershed(s) with documented improvement
h Stakeholders Involved and Their Roles	Identify partners responsible for planning and implementation. Describe each partner's role.
i Watershed Plan	Description of, or reference to, a watershed plan that identifies problems and proposes solutions to implement
j Restoration Work	Describe BMPs or other actions taken to improve watershed condition. Should provide a clear, succinct summary in plain language understandable to the general public. Avoid technical terms without a plain language description or definition (or photo) that demonstrates the meaning.

Evidence of Watershed-wide Improvement

k Impairments Removed (If applicable)	List waterbody IDs where one or more impairment causes identified in 2002 have been removed. Include the date of the IR or approved 303(d) list that reflects the removed waterbodies..
l Improving Trend in Water Quality	Describe the physical or chemical trend based on empirical data which may or may not be statistically significant (e.g., descriptive statistics) but nevertheless supports improvement.
m Supporting Trends (one or more)	<ol style="list-style-type: none"> Evidence of improving trend in related biological indicator/index Evidence of improving trend in water quality based on predictive/modeled data, with field level ground truthing Evidence of widespread significant load reductions
n Evidence of implementation	Evidence of widespread nonpoint source, point source, or other implementation actions

TEMPLATE 2b

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o No deteriorating trends	<i>No evidence of significant deteriorating trends in related parameters as called for in the analytical plan. A lack of evidence (data) for other parameters identified in the analytical plan is not adequate to support this line of evidence.</i>
p Photos/Graphics (optional)	<i>Attach available photos or graphics, with captions, illustrating the local problem or project, and results.</i>

Refer to "Guidance on Reporting Watershed Improvement under Measure SP-12" for more complete descriptions of information requested in this template.