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Office of Water
Washington, DC
EPA 841-R-14-006

National Coastal Condition Assessment 2015 Site Evaluation Guidelines



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NOTICE

The National Coastal Condition Assessment (NCCA) 2015 Site Evaluation Guidelines (SEG) and related documents are based on the previous Environmental Monitoring and Assessment Program's (EMAP) National Coastal Assessment (NCA) conducted in 2001 - 2004 as well as the National Coastal Condition Assessment 2010.

The goal of the National Coastal Condition Assessment (NCCA) is to provide a comprehensive assessment of the condition of the Nation's coastal waters (all coastal waters of the United States from the head-of-salt to confluence with ocean including inland waterways and major embayments such as Florida Bay and Cape Cod Bay). Details of the project and specific methods for field sampling, sample handling, and sample processing can be found in one of the following documents:

- *National Coastal Condition Assessment: Quality Assurance Project Plan (EPA 841-R-14-005)*
- *National Coastal Condition Assessment: Field Operations Manual (EPA 841-R-14-007)*
- *National Coastal Condition Assessment: Laboratory Operations Manual (EPA 841-R-14-008)*
- *National Coastal Condition Assessment: Site Evaluation Guidelines (EPA 841-R-14-006)*

This document (SEG) contains an overview of the process involved in locating a sampling site, evaluating the site, and selecting appropriate alternate sites when necessary. All Project Cooperators must follow these guidelines in selecting sites for the NCCA.

The suggested citation for this document is:

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ABBREVIATIONS

Abbreviation	Definition
GRTS	Generalized Random Tessellation Stratified survey design was used to select the X-sites for the 2015 NCCA.
km	kilometers
m	meters
NARS	National Aquatic Resource Surveys
NCCA	National Coastal Condition Assessment
psu	practical salinity units or parts per thousand
X-site	Location, identified by GPS coordinates, for a site selected for field sampling.

ROLES AND CONTACT INFORMATION

Field crews should contact the NCCA Project Leader or the appropriate Regional Coordinator with any questions about site selection.

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1 INTRODUCTION

The objective of the National Coastal Condition Assessment 2015 (NCCA) is to monitor and assess all coastal waters of the contiguous 48 States including both the marine and Great Lakes shorelines. In addition, Hawaii will use the same protocols in monitoring its coastal waters.

Here are the major steps in site evaluations:

- Review the Target Population Definition (**Section 2**) and Survey Design (**Section 3**).
- Interpret the Site Evaluation Spreadsheet (**Section 4**).
- Conduct a Desktop Evaluation to locate and verify that the X-site is Part of the Target Population and whether it is sampleable (**Section 5**).
- Seek permission to sample, if necessary (**Section 6**).
- Conduct Final Site Verification at the Location (**Section 7**).
- Submission of Site Evaluation/Verification Forms (**Section 8**).

As described in **Section 4**, EPA developed a site evaluation spreadsheet for each state to use in evaluating the sites and planning its sampling activities. The spreadsheet includes location information for each site and asks the evaluator to record whether the site meets the target definition in **Section 2**; its sampleability (**Section 5**); and whether landowner permission is necessary (**Section 6**). *The site evaluation spreadsheet must be completed and it must be submitted prior to field season and every few weeks thereafter as updates are made.*

As described in **Section 8**, field crews must assemble an official site packet containing important locational and access information for each site they are scheduled to visit. The packet must contain the appropriate maps, contact information, copies of permission letters (if applicable), and access instructions.

2 DEFINING THE TARGET POPULATION

This section describes the target population for each of the three components of the NCCA: the Great Lakes Nearshore, Great Lakes Embayment, and the Estuarine (Coastal Regions). Each statistically selected point is referred to as the “X-site” and defines where sampling activities are targeted. Before collecting water, sediment, and other samples at any site, it is imperative that the field crew correctly assess whether the site is part of the target population.

The target population for the NCCA has three components which are defined as follows:

1. *Great Lakes Nearshore*: The target population is sites within a fringing, shallow nearshore band that is heavily used by humans and most vulnerable to human activities within adjacent coastal watersheds. The nearshore’s uniquely “coastal” land-water interface zone includes: river mouths, open and semi-enclosed bays, embayments, and the more open waters adjacent to shorelines. It does not include the connecting channels of the Great Lakes (i.e., between the Lakes and the St. Lawrence River outlet). More specifically, the target population is limited to sites along the shoreline buffer within 5 kilometers (km) from shore or waters 30 meters (m) or less in depth, whichever is reached first. For Lake Erie, the target sites are generally close to a five kilometer buffer. The yellow arrows in **Figure 2.1** show target sites within a hypothetical nearshore region.
2. *Great Lakes Embayment*: Embayments of the Great Lakes are those areas nested within the shallow nearshore which are semi-enclosed by shoreline features, making them less hydrologically-open to open lake wind and waves. Embayments include harbors with man-made shoreline structures (e.g., break walls) which make them semi-enclosed. Embayments come in a variety of geomorphologic forms and thus vary in the degree of physical restrictions to water movement between the embayment and more open nearshore waters. In general though, embayments represent more protected waters that are proximal to, and vulnerable, to watershed activities. They may or may not have tributaries from land, but have a continuously-open water connection/channel to the adjacent Great Lake. As a working definition, the target population is limited to distinct semi-enclosed open water areas no smaller than 1 km² and no larger than 100 km². The green arrow in **Figure 2.1** shows an embayment.
3. *Estuarine (Coastal Regions)*: The target population for the estuarine resources consists of all coastal waters of the conterminous United States from the head-of-salt to confluence with the ocean, including inland waterways, tidal rivers and creeks, lagoons, fjords, bays, and major embayments such as Florida Bay and Cape Cod Bay. Head-of-salt is generally defined as 0.5 parts per thousand (ppt). For the purposes of NCCA, the head-of-salt represents the landward or upstream boundaries. The seaward boundary extends out to where an imaginary straight-line intersecting two land features would fully enclose a body of coastal water (see **Figure 2.2** and **Figure 2.3** for examples). All waters within the enclosed area are defined as estuarine, regardless of depth or salinity.

Embayments are semi-enclosed areas, nested within the Nearshore

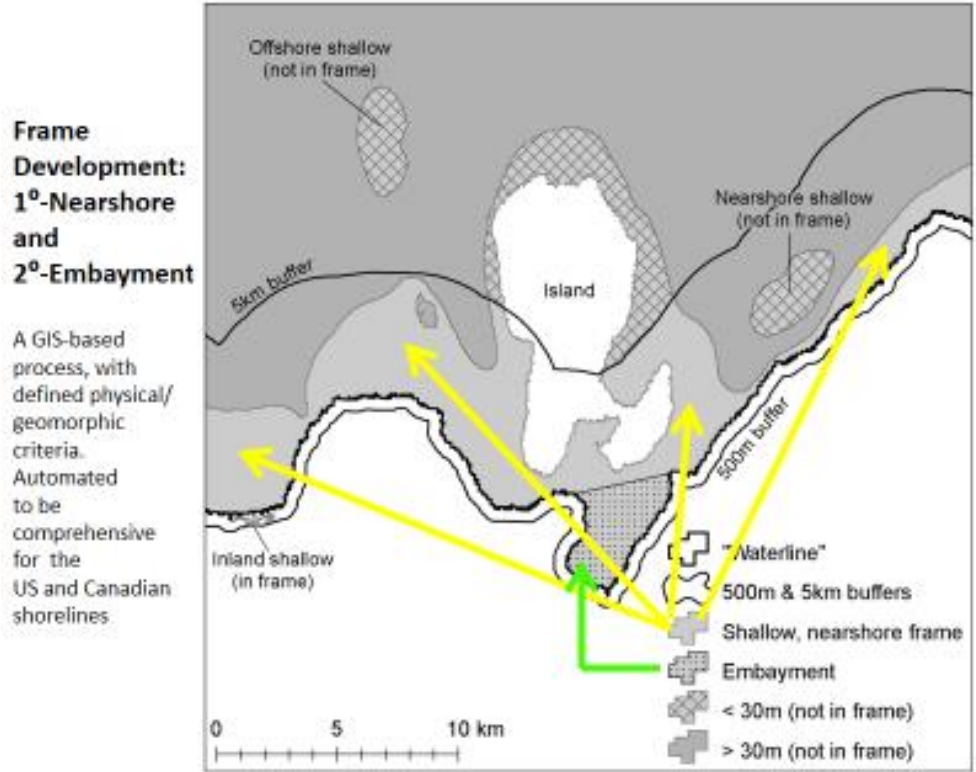


Figure 2.1 Great Lakes Nearshore and Embayment Target Sites

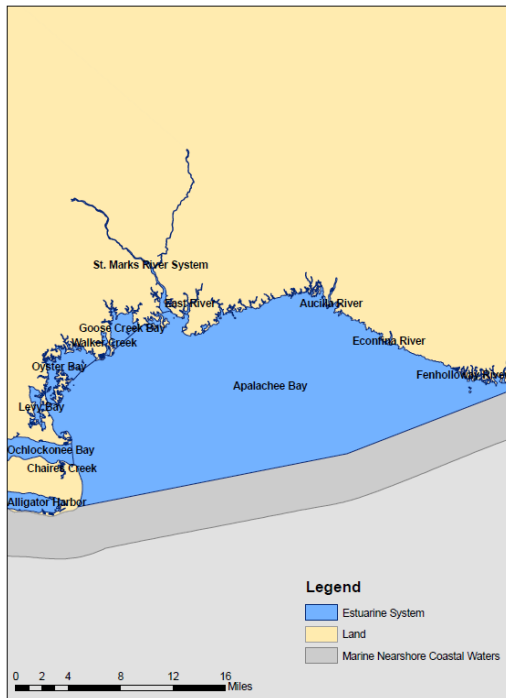


Figure 2.2 Example of an estuarine system comprised of an embayment plus a complex of bays and tidal rivers and creeks

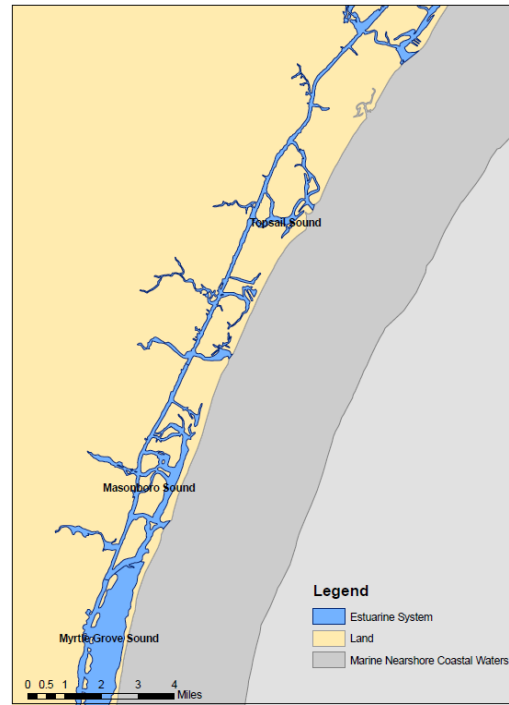


Figure 2.3 Example of an inter-coastal estuarine system

3 IMPORTANCE OF PANELS AND STRATA IN SELECTING SITES AND REPLACEMENTS

EPA classified sites by strata and panels before statistically selecting the sites using a Generalized Random Tessellation Stratified (GRTS) survey design for an area resource. The following two sections describe the stratification and panels used to classify the sites before selection. As described in Section 5, replacements come from the same strata and panel year as the original site.

3.1 STRATIFICATION

Stratification differs for each of the survey design components. EPA stratified two components, the *Great Lakes Nearshore* and *Great Lakes Embayments*, by state within each of the Great Lakes. Table 3.1 lists the strata for each state in the Great Lakes.

Table 3.1 Great Lakes Strata

State	# Strata	Strata	State	# Strata	Strata
IL	3	GL_Embayments	MN	2	GL_Embayments
		Lake_Michigan_NS_IL			Lake_Superior_NS_USA
		Lake_Michigan_NS_USA	NY	3	GL_Embayments
IN	3	Lake_Erie_NS_USA			
		Lake_Michigan_NS_USA			Lake_Ontario_NS_USA
NPS_NS_INDU	OH	2	GL_Embayments		
			Lake_Erie_NS_USA		
MI	11	GL_Embayments	PA	2	GL_Embayments
		Lake_Erie_NS_USA			Lake_Erie_NS_USA
		Lake_Huron_NS_USA	WI	5	GL_Embayments
		Lake_Michigan_NS_USA			Lake_Michigan_NS_USA
		Lake_Superior_NS_USA			Lake_Superior_NS_USA
		NPS_IS_ISRO			NPS_IS_APIS
		NPS_IS_SLBE			NPS_NS_APIS
		NPS_NS_PIRO			
		NPS_NS_SLBE			

EPA stratified the third component, *Estuarine (Coastal Regions)*, by the major estuaries shown in Table 3.2. If major estuaries extend into multiple states (e.g., Chesapeake Bay, Delaware Bay, and Lower Columbia River), then the sites are assigned to the state in which the sampling location resides. For example, most Long Island Sound sites are assigned to New York with a few assigned to Connecticut.

Table 3.2 Estuarine (coastal states): Strata

Province	State	# Strata	Strata (major estuaries)
Acadian Province	MA	2	AP_Massachusetts_Bay AP_Other_MA
	ME	4	AP_Casco_Bay AP_Other AP_Other_ME AP_Penobscot_Bay
	NH	1	AP_New_Hampshire_Estuaries
Carolinian Province	FL	3	CarP_Indian_River CarP_Other CarP_Other_FL
	GA	2	CarP_Other CarP_Other_GA
	NC	3	CarP_Albemarle_Pamlico_Sounds CarP_Other CarP_Other_NC
	SC	2	CarP_SC_CREEK CarP_SC_OPEN
Louisianan Province	AL	2	LP_Mobile_Bay LP_Other_AL
	FL	5	LP_Apalachee_Bay LP_Apalachicola_Bay LP_Other LP_Other_FL LP_Pensacola_Bay
	LA	7	LP_Atchafalaya_Vermilion_Bay LP_Barataria_Terrabonne LP_Breton_Chandeleur_Sound LP_Mississippi_River LP_Other LP_Other_LA LP_West_Mississippi_Sound
	MS	3	LP_Breton_Chandeleur_Sound LP_Other_MS LP_West_Mississippi_Sound
	TX	5	LP_Coastal_Bend_Bays LP_Galveston_Bay LP_Matagorda_Bay LP_Other_TX LP_San_Antonio_Bay
Californian Province	CA	3	CalP_Other CalP_Other_CA CalP_San_Francisco_Bay

Province	State	# Strata	Strata (major estuaries)
Columbian Province	CA	2	ColP_Other ColP_Other_CA
	OR	3	ColP_Lower_Columbia_River ColP_Other ColP_Other_OR
	WA	4	ColP_Lower_Columbia_River ColP_Other ColP_Other_WA ColP_Puget_Sound
Virginian Province	CT	1	VP_Long_Island_Sound
	DE	2	VP_Delaware_Bay VP_Other_DE
	MA	3	AP_Buzzards_Bay AP_Other AP_Other_MA
	MD	4	VP_Chesapeake_Bay VP_NJ_Barnegat_Inland_Bays VP_Other VP_Other_MD
	NJ	3	VP_Delaware_Bay VP_NJ_Barnegat_Inland_Bays VP_NY_NJ_Harbor
	NY	5	VP_Long_Island_Sound VP_NY_NJ_Harbor VP_Other VP_Other_NY VP_Peconic_Bay
	RI	3	VP_Narragansett_Bay VP_Other VP_Other_RI
West Indian Province	VA	2	VP_Chesapeake_Bay VP_Other_VA
	FL	7	CarP_Indian_River WIP_Biscayne_Bay WIP_Charlotte_Harbor WIP_Florida_Bay WIP_Other WIP_Other_FL WIP_Tampa_Bay

3.2 PANELS AND NUMBER OF VISITS

For each stratum, EPA selected base sites and oversample sites within different panels as shown in **Table 3.3**. Base sites are evaluated first, and replaced, as necessary, from the oversample sites. For the base sites, the panel names provide information about the number and type of visits.

Table 3.3 Panels and Visits (2010 and 2015)

Panel Name	Sampled in NCCA 2010?	Number of Visits	
		NCCA 2015	Fish Tissue Sampled During Visit 1?
Base10	Yes	1	No
Base10_FT	Yes	1	Yes
Base10_RVT2	Yes	2	No
Base10_RVT2_FT	Yes	2	Yes
Base15	No	1	No
Base15_FT	No	1	Yes

The **Base10** panel contains a subset of sites that were sampled in 2010 (i.e., the previous NCCA) and is to be sampled again in 2015. Base10 is sometimes appended by FT and/or RVT2 to create three more panels as follows:

- **Base10_FT**: This site has been selected for both NCCA2015 and the Great Lakes (Human Health) Fish Tissue Study. The site will be visited once to sample for both: 1) NCCA2015 and 2) Great Lakes Fish Tissue Study.
- **Base10_RVT2**: This site has been selected for two sampling visits in NCCA2015. The second visit is called the “revisit” and is used to assess crew sampling and temporal variability.
- **Base10_RVT2_FT**: This site will be sampled twice for NCCA2015. During Visit 1, the crew will collect fish tissue for the Great Lakes Fish Tissue Study.

The **Base15** panel contains ‘new’ sites that were *not* sampled in 2010. Base15 can be appended by the following to create another panel:

- **Base15_FT**: This site has been selected for both NCCA2015 and the Great Lakes Fish Tissue Study. During the sampling visit, the crew will collect indicators for NCCA2015 and fish tissue for the Great Lakes Fish Tissue Study.

Base15 sites are never appended by RVT2 because all revisits are conducted at NCCA2010 sites.

Oversample, or alternate, sites serve as replacement sites for any dropped base sites as explained in **Section 5**. They can also be used to supplement the NCCA sites for potential state-wide or other geographic-wide assessments or enhancements, if desired. There are two oversample panels:

- **Base10_OverSamp**
- **Base15_OverSamp**

The next two sections describe the Site Evaluation Spreadsheet and rules for using the oversample sites to replace base sites when necessary.

4 INTERPRETING THE SITE EVALUATION SPREADSHEET

Because of its importance in evaluating the target population and documenting information about each site, this section describes the spreadsheet that each state received from EPA. The spreadsheet provides the base sites and oversample for any necessary replacements following the rules in the next section.

The Site Evaluation Spreadsheets are available on the NARS SharePoint site and can be emailed to crews by EPA if needed (contact the Contractor Field Logistics Coordinator). The SharePoint site can be accessed at:

https://usepa.sharepoint.com/sites/OW_Community/nars/_layouts/15/start.aspx#/SitePages/Home.aspx and the spreadsheets are available under NCCA/NCCA 2015/Site Evaluation Spreadsheets/Original-NCCA2015-State-Evaluation-Spreadsheets.

The Site Evaluation Spreadsheet has two main parts:

- **EPA-Supplied LOCATION and DESIGN INFORMATION** has column headings that are highlighted in yellow. This part of the spreadsheet provides information about the site. This part of the spreadsheet is locked and cannot be edited. See **Figure 4.1**.
- **DESKTOP and ON-SITE EVALUATIONS** has column headings that are highlighted in green. These columns are used by the site evaluator to record findings from the desktop evaluation, and if necessary, the on-site evaluation. See **Figure 4.2**.

The following two sections describe each part of the spreadsheet.

4.1 INTERPRETING EPA-SUPPLIED LOCATION AND DESIGN INFORMATION

Figure 4.1 displays the left-hand side of the spreadsheet which provides the location and survey design information for each site selected for the state. Each panel year (2010 or 2015) and stratum combination is separated by a row shaded in yellow. The blue rows identify the base sites for the year/stratum combination. Immediately below the blue rows are unshaded (white) rows identifying replacements, or oversamples, for the year/stratum combination. **Figure 4.1** provides an example which shows only 3 rows for base sites and 3 rows for the oversample sites; however, depending on the year/stratum combination, there can be any number of rows for base and oversample sites, and the numbers can differ from each other (i.e., there may be more than 1 oversample for each base site).

As discussed in **Section 5**, within the same year/stratum combination, the only appropriate replacements for base sites are the oversample sites identified in the white rows for that particular year/stratum combination. The count of “total sampled sites”, on the left above the site locations, is different for each state. This count is calculated as the total number of sampling visits within a state (i.e. one visit to all sites plus a second visit to revisit sites).

Table 4.1 Panel Codes in Site Evaluation Spreadsheet

Type	Panel Year	Panel codes	Description
Base	2010	<i>Base10</i>	Site sampled in 2010 (“2010 site”), has been selected for sampling again in 2015.
		<i>Base10_RVT2</i>	2010 site to be sampled twice in 2015. That is, the field crew should plan a visit 1 and visit 2 during the same index period.
		<i>Base10_FT</i>	2010 site to be sampled for both 2015 NCCA and the Great Lakes Fish Tissue Study.
		<i>Base10_RVT2_FT</i>	2010 site to be sampled for both 2015 NCCA and the Great Lakes Fish Tissue Study in the first visit. It is sampled twice for 2015 NCCA, that is, the field crew should plan a visit 1 and visit 2 during the same index period.
	2015	<i>Base15</i>	New site for 2015 (“2015 site”)
		<i>Base15_FT</i>	2015 site to be sampled for both 2015 NCCA and the Great Lakes Fish Tissue Study during the same visit.
Over-Sample	2010	<i>Base10_OverSamp</i>	2010 replacement site for non-sampleable 2010 site
	2015	<i>Base15_OverSamp</i>	2015 replacement site for non-sampleable 2015 sites

4.2 RECORDING DESKTOP AND ON-SITE EVALUATIONS

Figure 4.2 displays the right-hand side of the spreadsheet which provides space for evaluators or field crews to complete the desktop and in-field assessments described in Section 5. The following information is collected in the right-hand side of the spreadsheet:

- a. **Contact Information.** Provide the name, phone number, and email address of the person most knowledgeable about the desktop review and in-field reconnaissance.
- b. **Desktop and On-Site Evaluations:** Use the dropdown menus to respond to each of the following questions. Figure 4.3 lists the questions and choices in the drop-down menus in the site evaluation spreadsheet. **For EPA’s survey weight calculations, it is important that all three questions have answers for all evaluated sites.**

As crews work through the site evaluation process described in Section 5.1, any site which receives the following answers:

- **Yes** responses for all three questions: Must be sampled.
 - **No** for any question, the site would not be sampled (see example categories in Figure 4.4).
 - **Maybe** for any question: Must have an on-site evaluation or subsequent planned sampling visit.
- c. **Comments (optional):** Use the space to provide any information that might be useful for EPA’s review such as reasons for dropping a site; comments about target determination; other additional information related to the three questions; and/or corrections to a site name.

Question 1: Does the site meet the requirements of a target site?

1. Yes, Target
2. Maybe, requires on-site evaluation
3. Maybe, tide too low (return at appropriate time in tidal cycle)
4. Maybe, mudflat at certain times (return at appropriate time in tidal cycle)
5. Unable to access site, but clearly is target (e.g., in shipping channel)
6. Unable to access site, but probably target (e.g., site map indicates target)
7. Unable to access site, and unable to determine if target
8. No, Dry
9. No, Mudflat (permanent)
10. No, Wetland
11. No, Great Lakes site is **not** estuarine (outside the imaginary line connecting two land features)
12. No, Marine site has salinity <.5 PPT (freshwater is out of scope except within Great Lakes)
13. No, Map Error (X-site is clearly not target, for example: parking lot)
14. No, Other (explain in comments)

Question 2: Is the site accessible and safe to sample?

Note that responses to the second question reference whether the site would be sampleable if landowner permission is granted.

1. Yes, Sampleable
2. Maybe, Temporarily inaccessible (try again later)
3. Maybe, Unable to access site; available sources are insufficient to determine if target
4. No, Equipment related unsampleable (e.g., less than 1 meter in depth).
5. No, Permanently inaccessible (unable/unsafe to reach site)
6. No, EPA concurred that site could be dropped because access would require extreme efforts

Question 3: Has landowner granted permission to access the site?

1. N/A, public access available
2. Yes, Landowner granted permission
3. No, Landowner denied permission

Figure 4.3 Site Evaluation Spreadsheet: Questions and Dropdown Answers

After you confirm the location of the X-site, evaluate area surrounding the X-site and classify the site into one of four major sampling status categories: Sampleable, Non-Sampleable (temporary), No Access to site, or Non-Target (not sampled).

Sampleable Categories (Review the target population definition for more specific information)

- *Estuarine Waters*—There is water and the site is within an estuarine environment (e.g., tidal habitats and adjacent tidal wetlands and waters that are at least occasionally diluted by freshwater runoff from the land) (or these conditions exist within 0.02 nm or 37m from the X-site as described in **Step 6 in Section 5.1**).
- *Great Lakes Coastal Waters* – There is water and the site is within 5 km of shore but not deeper than 30 meters (or these conditions exist within .02nm or 37m of the X-site as described in **Step 6 in Section 5.1**).

Note: a site can still be identified as sampleable even if not all indicators can be collected. For example, kelp beds may hinder a crew's ability to collect sediment however other indicators can still be collected. In this instance, the site would be sampleable. Refer to the Field Operations Manual Section 5 for more information on moving to collect sediment samples.

Non-Sampleable Temporary Category (site can be revisited)

- *Non-Sampleable Temporary - Other*—The site could not be sampled on that particular day, but is still a target site. Examples might include a recent precipitation event that has caused unrepresentative conditions. The site should be revisited.

No Access to Site Categories

- *Access Permission Denied*--You are denied access to the site by the landowners.
- *Permanently Inaccessible*--Site is unlikely to be sampled by anyone due to physical barriers that prevent access to the site (e.g., major shipping lane).
- *Temporarily Inaccessible*--Site cannot be reached at the present time due to barriers that may not be present at some future date (e.g. high water, extreme weather event) but are expected to exist throughout the index period.
- *Equipment-related inaccessibility: site <1m deep* – The site could not be sampled because it is less than 1 meter deep and the draft of the boat did not allow access. No suitable depth could be found within 0.02nm or 37m from the X-site. This site is still part of the target population and if the crew can sample a site that is less than 1 meter deep, they should do so.
- *Equipment-related inaccessibility: site >1 m deep* – The site was deeper than 1 meter but could not be sampled due to the draft on the boat being used. No suitable depth could be found within 0.02 nm or 37m from the X-site. Before dropping this target site, every attempt should be made to bring a boat of suitable draft for the location.

Non-Target (Non-Sampleable) Categories (permanent condition; site is non-target)

- *Dry site*--There is no coastal water anywhere within a 0.02nm or 37m radius centered on the X-site. If determined at the time of the sampling visit, note as "Dry-Visited"; if site was determined to be dry from another source and/or field verified before the actual sampling visit, note as "Dry-Not visited."
- *Wetland*– There is standing water present, but site is in a wetland.
- *Mudflat* – There is no standing water, but site is clearly a permanent mudflat. (If site is likely to be covered with water at other times during the index period, the site should be classified as non-sampleable (temporary) and rescheduled for another day.)
- *Great Lakes, Not Embayment or Not nearshore (i.e., beyond 5 km from shore)*-- site is outside of the imaginary straight-line intersecting two land features that would fully enclose an embayment and is not in the nearshore frame.
- *Not estuarine*—site is outside of the imaginary straight-line intersecting two land features that would fully enclose a body of water.
- *Marine, salinity <0.5 ppt . freshwater is out of scope except with the Great Lakes.*

Figure 4.4 Examples of Sampleable/Nonsampleable Categories

5 DESKTOP EVALUATION

This section describes the site replacement process during the desktop review, and if necessary, the on-site evaluation of the site to determine whether the site is part of the target population. After explaining the replacement process, it provides an example.

The objective for the desktop evaluation is to eliminate sites that are clearly not part of the target population or cannot be sampled. By using data that is easily obtainable and verifiable, the desktop evaluation locates the site and determines if the selected site is, or likely will be, in the target population and sampleable during the 2015 field sampling season. If information obtained during the desktop evaluation is not conclusive, then a field visit is required.

In order to achieve the most robust results possible with the probabilistic sampling design, every effort must be made to sample the base sites that were generated. Some sites may be accessed easily while others may require more lengthy or time-consuming trips. It is very important not to reject a site based on inconveniences in access.

Figure 5.1 Site Sampling Objective

5.1 STEPS IN DESKTOP EVALUATION

Before starting the desktop evaluation, the field crew should retrieve as much information as possible for each site.

Figure 5.3 identifies the steps to locate and evaluate the eligibility and sampleability of selected field sites. The desktop process consists of the following steps:

1. **Study the Site Evaluation Spreadsheet** described in **Section 4.1**.
2. **Gather information about the site.** A number of sources of information are available, including aerial images, topographic maps, state, county, or tribal coastal data, the National Hydrography Dataset (NHD), personal and local knowledge, literature and scientific reports, land ownership records, and the internet.
3. **Locate the X-site.** Use the most recent aerial imagery that can be obtained. Using this imagery and any supplemental sources of information, determine if the X-site is within 0.02 nautical mile (nm) or 37 m of a coastal estuary or the Great Lakes nearshore or embayment.
4. **Determine if X-site is within the target population.** If the site appears to be outside of an estuarine area (for marine sites), not an embayment or greater than 5 km from shore (for Great Lakes sites), contact your Regional Coordinator and the Contractor Field Logistics Coordinator before dropping the site and replacing it with an alternative site. (Contact Information is provided on **page iv**.) With their approval, select a replacement site following the protocol described in **Step 8**.
5. **Determine sampleability.** Review maps, other collected information, or enlist the assistance of someone with personal knowledge of the location of the X-site to determine if it is physically accessible by field crews and safe to sample. **Section 4.2** defines various sampleable/non-sampleable categories that are to be used in

completing the site evaluation spreadsheet. ***If a field crew can safely collect samples for any indicator, then the site must be considered sampleable.***

6. **Examine nearby area.** Review maps and other sources of information to determine if a sampleable site exists within a circle of 0.02 nm radius (± 37 meters) around the X-site. This distance should account for typical “anchor swing” of the sampling vessel. If a sampleable site does not exist within this radius, then follow the procedures for selecting an alternate site in the next step.
7. **Document findings in the Site Evaluation Spreadsheet.** If the maps and other sources of information indicate **conclusively** that the site is **not** accessible, for example the site is in a shipping channel, note the reason(s) for this conclusion and an assessment of whether the X-site is part of the target population. Information provided in this spreadsheet is critical to the statistical analyses of data from the survey. If appropriate, EPA will remove sites from the sample frame for future NCCAs. Complete the spreadsheet (see **Figure 4.2**) to provide EPA with as much information as possible in its data analysis. Three aspects are especially important and must be completed for all evaluated sites. (See **Section 4.2** for drop-down choices). Provide the findings of whether the site:
 - a. Meets the target population definition. Even if the site isn’t safe to be sampled, provide your best assessment for whether the site is in the target population.
 - b. Is accessible and safe to sample. If the site will require extreme resources and/or considerable time to sample, contact the NCCA Project Leader for approval before dropping the site (see contact information on **page iv**). Consider only physical accessibility here, and not access or sampling permission (i.e. answer this question with the assumption that permission would be granted).
 - c. Has landowner approved access to the site (if necessary) (see **Section 6**).
8. **Select replacement sites by following EPA’s protocol.** The sampling site lists for the NCCA are organized by state in the Site Evaluation Spreadsheets. Each spreadsheet contains a list of all primary (base panels) and alternate (oversample panels) sites in the State. The sites are listed on the spreadsheet in the order in which they were randomly selected. All primary (base) sites must be evaluated for potential sampling and should be sampled unless they are determined to be non-target, non-sampleable, or non-accessible. If a primary site is rejected because it is non-sampleable or not accessible, then it will be replaced by the next alternate (oversample) site within the same panel year (2010 or 2015) and Stratum.

IMPORTANT: Sites are organized to be replaced in **SiteID** order within **Base Year** (2010 or 2015) and within each major estuary group or Great Lake (i.e., the stratum) from the site evaluation spreadsheet. Two important rules to follow in the replacements:

- If a site is evaluated and it is determined that it cannot be sampled, then it is to be replaced by the next oversample site in order on the list within the **Base Year** and **Stratum**.
- If the panel of the dropped site is *Base10_RVT2* or *Base10_RVT2_FT*, then its **replacement** takes on the RVT2 or RVT2_FT assignment. That is, the site must be **visited twice** in 2015 and **human health fish tissue collected** during the first visit (if FT).

Site Replacement - Key Points to Remember:

- If a site is evaluated and it is determined that it cannot be sampled, then it is to be replaced by the next site in order on the list within the 1) panel year (2010 or 2015); and 2) stratum defined by major estuary group or Great Lake.
- If you drop a revisit site, the replacement site from the oversample list becomes the new revisit site.

Figure 5.2 Key Points for Replacements

9. **Prepare the official site packet.** The field crew should keep information and data sources used in the desktop evaluation as part of the official site packet for each site. For each site deemed sampleable or inconclusive, the site packet also should include forms, any necessary research permits (if applicable), and site access instructions. The packet also should include the appropriate maps, aerial images, contact information, and copies of landowner permission for access.

5.2 EXAMPLE IN REPLACING A DROPPED SITE

For example, as shown in **Table 5.1**, if Base_10's NCCA15-9991 and the surrounding area (i.e., within the 37 m radius) are non-sampleable, then the desktop audit should evaluate the first listed site ID in Base10_OverSamp in the Stratum LP_GC_Bays. In this case, NCCA15-9911 is its replacement. If NCCA15-9911 also is determined to be unsampleable, then evaluate the next site in the oversample list: NCCA15-9912.

Table 5.1 Example: Site Replacement

Site ID	Site ID from NCCA 2010	State	Site Name	Province	Panel: Base/ Oversample	Stratum
NCCA15-9991	NCCA10-3344	AL	KF Bay	HS Province	Base10	LP_GC_Bays
NCCA15-9993	NCCA10-9933	AL	ML Bay	HS Province	Base10_RVT2	LP_TG_Bays
NCCA15-9994	NCCA10-9956	AL	ML Bay	HS Province	Base10	LP_TG_Bays
NCCA15-9911	NCCA10-4455	AL	KF Bay	HS Province	Base10_OverSamp	LP_GC_Bays
NCCA15-9912	NCCA10-4466	AL	KF Bay	HS Province	Base10_OverSamp	LP_GC_Bays
NCCA15-9913	NCCA10-9941	AL	ML Bay	HS Province	Base10_OverSamp	LP_TG_Bays
NCCA15-9914	NCCA10-9961	AL	ML Bay	HS Province	Base10_OverSamp	LP_TG_Bays
NCCA15-9915	NCCA10-9976	AL	ML Bay	HS Province	Base10_OverSamp	LP_TG_Bays

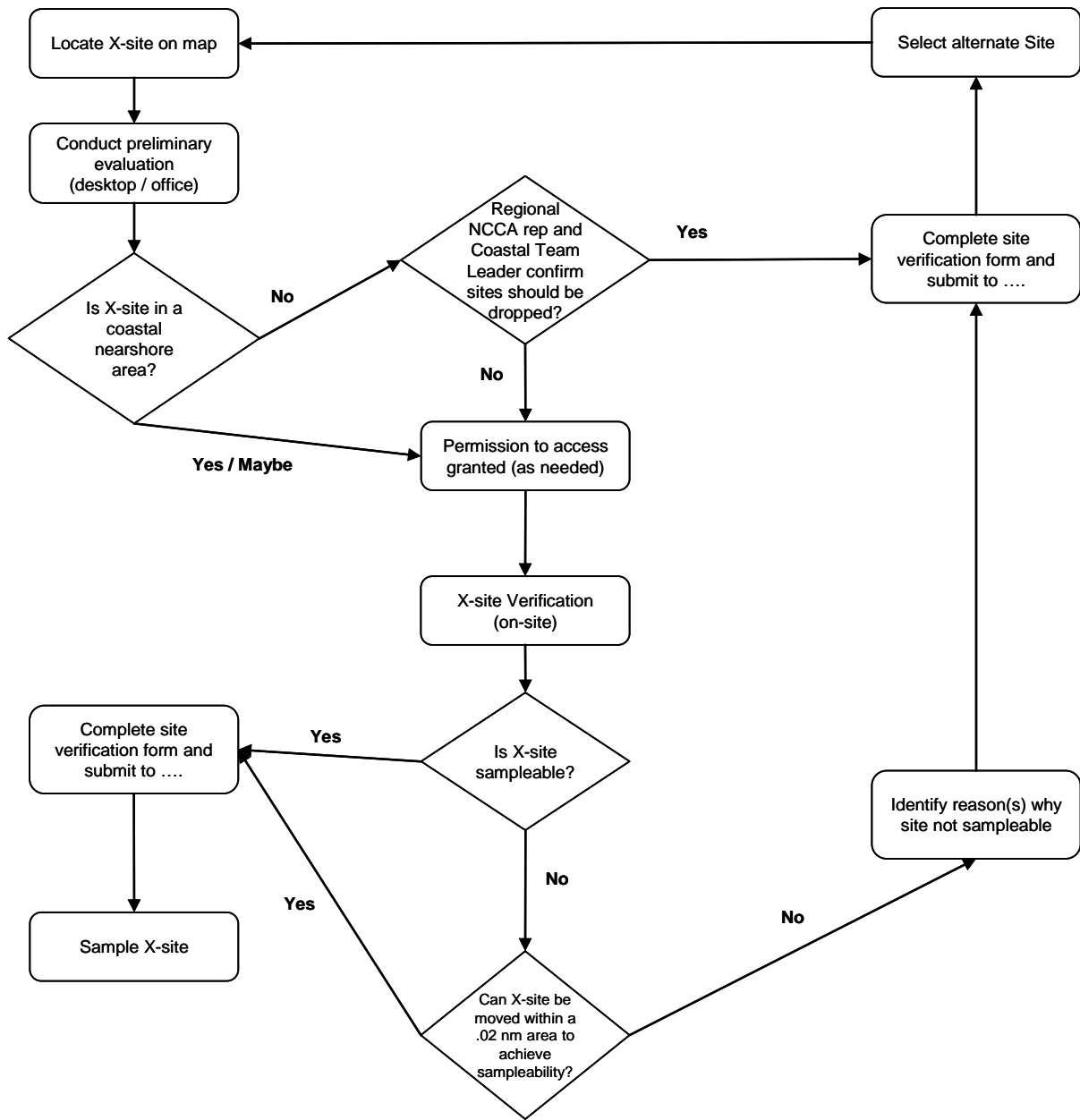


Figure 5.3 Flowchart of Site Evaluation Process

6 OBTAIN LANDOWNER PERMISSION (WHEN APPLICABLE)

An important step is to determine, and obtain if necessary, landowner permission and any other requirement. NCCA sites are generally accessible by boat from the open waterway. To access the waterway, the field crew should first determine if a public dock will provide suitable access for the boat. If a private dock is more convenient, then the field crew must obtain landowner permission before using the dock. In addition, field crews must comply with any special conditions and requirements for accessing and sampling on State, Tribal or Federal lands/waters.

Each field crew is responsible for obtaining permission to access their sampling sites. Landowner information can be obtained from the county tax assessor office. Tax assessor maps will display landowner boundaries, addresses and, oftentimes, phone numbers. This information enables the field crew to contact landowners before the sampling day, and identifies which landowner owns which portions of the shoreline. The provision of county maps for the field crews will help clarify access to the targeted sampling site.

EPA recommends that each field crew obtain permission prior to the sampling day to minimize loss of time during field sampling. The field crew can contact the landowner either through an in-person reconnaissance visit or through mailing permission request letters to the landowner, such as a letter signed by the Regional Monitoring Coordinator with a permission slip for the landowner to return. Crews should also consider requesting landowner permission for oversample sites in case of dropped base sites. **Figure 6.1** provides a sample letter and permission form that your program or organization can modify as appropriate. In either case, a signed permission slip, such as the one shown in **Figure 6.1** is important to use as documentation on the day of sampling.

Field crews should work with appropriate state, tribal and federal agencies to determine any permits or special conditions that apply to the access points and the coastal waters. As needed, EPA will assist field crews in coordinating efforts with Tribes and other federal agencies. Field crews should work with the appropriate state agencies to determine any permits or special conditions that apply to state lands.

Some crews will choose to deal with access issues on the day of the sampling event. This method is usually adequate if a desk-top reconnaissance shows that the area around the site includes enough public land to gain access to the waterway. If the site is in an area that is largely privately owned land, waiting until the day of sampling could pose unnecessary delays and access issues that should have been resolved prior to the scheduled sampling day.

(Date)
Dear Landowner:

The US Environmental Protection Agency, in cooperation with State agencies, is conducting an environmental assessment of coastal waters (estuaries and Great Lakes) across the United States. Approximately 700 coastal sites and 375 Great Lakes sites were statistically selected for sampling in 2015. Water quality chemistry, aquatic life, and habitat will be evaluated at each site. The findings of the survey will not be used for enforcement or regulatory purposes.

We are contacting you prior to the site visit to obtain permission (form enclosed) to access the sampling site. We have enclosed a copy of a map(s) with the site(s) identified by an "X" at the specific point to be sampled. We realize that working on your property is a privilege and we will respect your rights and wishes at all times.

Please return the completed Access Permission Form in the enclosed envelope by (date). If you have any questions concerning this request, please contact me (phone number). We are looking forward to hearing from you.

Sincerely,

(Name)

I grant permission to the biological field crew from (state agency, Cooperator, or contractor) to access the coastal target site located on my property as part of the EPA's National Coastal Condition Assessment.

_____ Do grant permission
_____ Do grant permission but with the following restrictions:
_____ Do not grant permission

Landowner Name (Please print): _____
Landowner Signature: _____
Date: _____
Phone Number: _____
Address: _____

*If the operator is different than the landowner, please list the name and phone number below so that we may contact the operator before the site visit.

Figure 6.1 Landowner Letter and Permission Form

7 FINAL SITE VERIFICATION AT THE LOCATION

The final step is to visit the site, usually as part of reconnaissance or the actual field sampling visit. Complete a Verification Form for each site visited with the intent to sample (regardless of whether it is sampled), following the procedures described below.

Equipment:

- Sampling permit and landowner access (if required)
- Field Operations Manual and/or laminated quick reference guide
- Site dossier, including access information, site spreadsheet with map coordinates, street and/or topographic maps with “X-site” marked
- NCCA Fact Sheets
- GPS unit (preferably one capable of recording waypoints) with manual, reference card, extra battery pack

Figure 7.1 Equipment for In-Field Verification

1. **Record directions.** While traveling from a base location to a site, the field crew provides a detailed description of the route taken on the Site Verification Form (**Figure 7.2**) or the appropriate screen in the electronic forms. The directions will allow others to find the site again if it is selected for a repeat visit in the future.

2. **Confirm location.** Upon reaching the target site, confirm that the field crew is located at the same latitude and longitude identified in spreadsheet for the X-site. Sampling site verification

is based on map coordinates and locational data from the GPS.

- a. **Navigate to the X-site.** Navigate the sampling vessel as close as possible to the target X-site using GPS (you must be no more than 0.02 nautical miles (nm) or 37 meters from the target X-site). Compare the target X-site coordinates with the GPS coordinates displayed at the sampling site.
 - b. **Record, in the Site Verification Form, the actual coordinates** of the vessel after anchorage, not the initial intended coordinates, on the field data sheet. Make sure the GPS unit is set to reference the NAD 83 geospatial data set. This new location is where sampling will begin and is called the Y-location.
 - c. **Record the type of satellite fix** (≤ 3 or ≥ 4) for QA purposes in the Site Verification Form.
3. **Assess sampleability** as described in **Section 2** and **Section 5**. In addition, verify that the water is deep enough so that samples can be collected from the boat, otherwise, the site is non-sampleable. Questions about wading to sample shallow water should be directed to the Contractor Field Logistics Coordinator.
4. **Assess relocations** if the X-site itself is not sampleable. Every attempt should be made to relocate to a sampleable area within a 0.02 nm (37m) radius of the intended location. In searching for a suitable relocation site, the field crew leader should choose a specific compass heading (e.g., north, south, east, west) and slowly motor the vessel in that direction for approximately 15-20 m. Assess the potential relocated site as described in **Section 5.1**. Should the relocated site fail to meet the operational definition sampleable, then this process may be continued using the same heading out to the 37 m mark or using a new heading until an acceptable sampling location is

found. If after a sufficient amount of effort is expended and no suitable site is found, then the determination may be made that the site is non-sampleable.

5. Mark the appropriate bubble on the Site Verification Form (**Figure 7.2**). Do not sample non-target or "Non-sampleable" or "No Access" sites. Fill in the "NO" bubble for "Did you sample this site?" and fill in the appropriate bubble in the "Non-Sampleable-Permanent" or "Non-Sampleable-Temporary" section of the Verification Form; provide detailed explanation in comments section. In the site evaluation spreadsheet of base and oversample sites (e.g., **Figure 4.2**), provide comments in the last column.

NCCA 2015 SITE VERIFICATION (Front)					Reviewed by (initial): _____
Site ID: _____		Visit: <input type="radio"/> 1 <input type="radio"/> 2		Date: ____ / ____ / ____	
Site Name: _____		State of Site Location: _____		Field Crew: _____	
DID YOU SAMPLE THIS SITE?					STATION DEPTH (XX.X m): _____
<input type="radio"/> YES If YES, check one below:			<input type="radio"/> NO If NO, check one below:		
SAMPLEABLE (Choose method used) <input type="radio"/> Marine <input type="radio"/> Great Lakes			NON-SAMPLEABLE-PERMANENT- Replace Site <input type="radio"/> Map Error <input type="radio"/> Site too shallow for navigation/sampling <input type="radio"/> Unsafe <input type="radio"/> No Access NON-SAMPLEABLE-TEMPORARY- Reschedule <input type="radio"/> Temporarily Inaccessible <input type="radio"/> Other (Explain in comments)		
ARRIVAL TIME: ____ : ____ (hh:mm)					
DEPART TIME: ____ : ____ (hh:mm)					
VERIFICATION INFORMATION					
Site verified by (fill in all that apply): <input type="radio"/> GPS <input type="radio"/> Local Contact <input type="radio"/> Signs <input type="radio"/> Roads <input type="radio"/> Map/Chart					
<input type="radio"/> Other (Describe Here): _____ <input type="radio"/> Not Verified (Explain in Comments)					
LOCATION					
Coordinates of Y-LOCATION Decimal Degrees NAD 83	Latitude	Longitude	Type of GPS Fix <input type="radio"/> ≤3 <input type="radio"/> ≥4	Y-Location is within 37m of X-site? <input type="radio"/>	
	_____	_____			
HABITAT TYPE: <input type="radio"/> Tidal River <input type="radio"/> Open Water <input type="radio"/> Marsh/Wetland <input type="radio"/> Embayment <input type="radio"/> Inter-Tidal <input type="radio"/> Rivermouth					
<input type="radio"/> Other, explain: _____					
BOTTOM TYPE: <input type="radio"/> Coral Reef <input type="radio"/> Oyster Bed <input type="radio"/> Grass Bed <input type="radio"/> Sand <input type="radio"/> Rocky/Shell <input type="radio"/> Hardpan <input type="radio"/> Mud					
<input type="radio"/> Other, explain: _____					
Debris Present?: <input type="radio"/> YES <input type="radio"/> NO		If Yes, TYPE: _____			
<input type="radio"/> Glass <input type="radio"/> Plastic <input type="radio"/> Wood <input type="radio"/> Cans <input type="radio"/> Other, explain: _____					
SAV Present?: <input type="radio"/> Yes <input type="radio"/> No		ABUNDANCE: _____		(Sparse, dense, etc)	
Macroalgae Present?: <input type="radio"/> Yes <input type="radio"/> No		ABUNDANCE: _____		(Sparse, dense, etc)	
GENERAL COMMENTS					
DIRECTIONS TO SITE					
5924322647		03/31/2015 NCCA 2015 Verification		D1	

Figure 7.2 Site Verification Form

8 SUBMISSION OF SITE EVALUATION/VERIFICATION FORMS

The final step is to provide EPA with the necessary documentation. For all base sites and all oversample sites selected as replacements (sampled and non-sampleable), the field crew must provide the two documents identified below. The information is critical for the statistical evaluations for the final report.

8.1 SITE EVALUATION SPREADSHEET

For information collected prior to the start of the 2015 sampling index period, please upload your Site Evaluation Spreadsheet to the EPA SharePoint site under NCCA 2015/Site Evaluation Spreadsheets/Crew Submitted Site Evaluation Spreadsheets. The SharePoint site can be accessed at:

https://usepa.sharepoint.com/sites/OW_Community/nars/_layouts/15/start.aspx#/SitePages/Home.aspx

If you need access to the SharePoint site, please send an email to Kendra Forde at forde.kendra@epa.gov and cc: Treda Grayson at grayson.treda@epa.gov. If you are having trouble with the SharePoint site, you may email interim and final spreadsheets to the Contractor Field Logistics Coordinator and your Regional Coordinator (see **page iv** for contact information). After the start of the **field season**, **please email any updates to the spreadsheet every two weeks**. Reminders will be sent out from the Contractor Field Logistics Coordinator as needed. This process will help to ensure that all appropriate base and replacement sites are sampled.

At the conclusion of sampling, final completed site evaluation spreadsheets must be submitted to EPA via the SharePoint as described above (or by email if necessary) **no later than October 31, 2015**. Crews should strive to submit the final completed site evaluation within 2 weeks of sampling the last site. The Contractor Field Logistics Coordinator will contact each crew to verify information and ensure that all required information is completed.

8.2 SITE VERIFICATION FORMS (PART OF FORM PACKET FOR EACH SITE VISITED)

If using paper forms instead of the electronic forms, send completed evaluation forms (with other field forms as appropriate) for the sites to the Information Management Coordinator, Marlys Cappaert, in the FedEx envelope provided in the site kit. Forms should be submitted within 2 weeks of sampling. If the crew has not provided the forms within 2 weeks, the Contractor Field Logistics Coordinator will notify the crew that the forms have not yet arrived.

9 REFERENCES

Kelly, Jack. 2014. Presentation “Influence of watersheds on nearshore and embayments” delivered during internal EPA webinar on April 22, 2014.

Olsen, Tony. 2014. “National Coastal Condition Assessment 2015 Coastal Estuarine Survey Design.” Internal Working Document created on January 12, 2014.

Olsen, Tony. 2014. “National Coastal Condition Assessment 2015 Great Lakes Survey Design.” Internal Working Document revised on February 17, 2014.

USEPA. 2010. *National Coastal Condition Assessment: Site Evaluation Guidelines*. U.S. Environmental Protection Agency, Washington, DC.