NOAA Damage Assessment and Restoration Program

Joint Assessment Team Meeting

Baseline

Annapolis, Maryland

Nov. 18, 2003

REGULATORY CONSTRUCTS

Objective of Damage Assessment

- Return injured natural resources and lost services to **baseline**, and compensate for lost interim uses
- Baseline can be contaminant specific, resource specific, service-specific, etc.

Baseline Definition

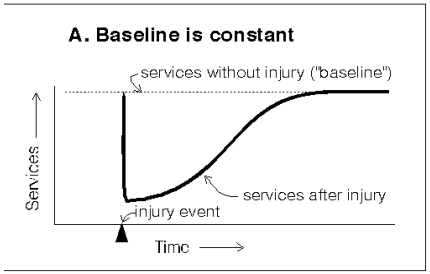
- The condition(s) that would have existed [in the assessment area] had the release [or discharge] not occurred (CERCLA §11.14(e) and OPA §990.30)
- Baseline is not simply the condition of the resource in the area of the release, but is the condition the resource would be in today if it had not been exposed to the release
- **Baseline** may differ from **pre-release** conditions, because of non-actionable (permitted) events that would have affected natural resources even if no release occurred

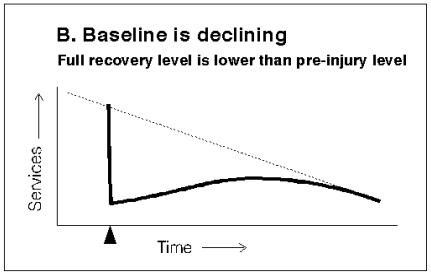
CERCLA Guidelines (§11.72b)

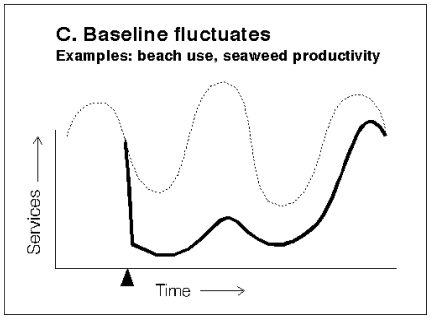
- Should reflect conditions that would have been expected at the assessment area had the release not occurred, taking into account both natural processes and those that are the result of human activities
- Should include the normal range of physical, chemical, or biological conditions for the assessment area or injured resource [with statistical descriptions of that variability]
  - Causes of extreme or unusual values in baseline data should be identified and described

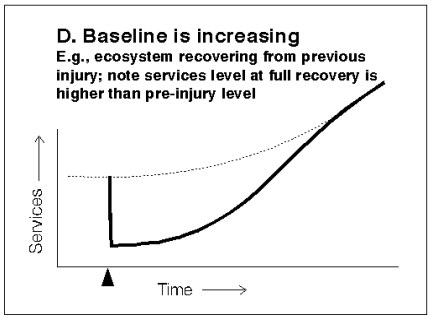
Exhibit 2-3

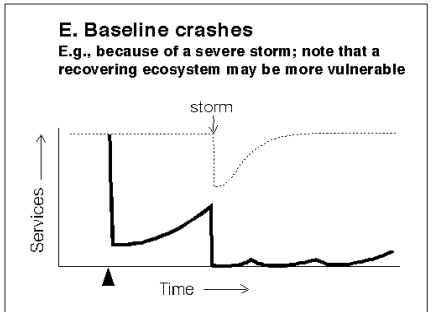
EXAMPLES OF POSSIBLE BASELINE FORMS











CERCLA Guidelines cont. (§11.72b)

- Should be as accurate, precise, complete, and representative of the resource or service
  - Data used for the baseline and services reduction determinations must be collected by comparable methods
  - Otherwise, when the same method is not used, comparability of the data collection methods must be demonstrated
- Must be restricted to those data necessary for conducting the assessment at a reasonable cost
  - In particular, data collected should focus on parameters that are directly related to the injuries quantified and to data appropriate and necessary for damage determination

CERCLA Guidelines cont. (§11.72b)

- May use baseline data that are not expected to represent fully the baseline conditions, subject to all the following requirements:
  - Must document how the alternative rationale serves as a suitable substitute
  - The substitute baseline data must not result in a difference between baseline and the conditions in the assessment area to exceed the difference that would be expected if the baseline were completely measured
  - It is determined that it is either not technically feasible or not cost-effective to measure the baseline conditions fully and that these baseline data are as close to the actual baseline conditions as can be obtained subject to these limitations

CERCLA Guidelines cont. (§11.72c)

- If available and applicable, **historical data** for the assessment area or injured resource should be used to establish baseline
- If a significant length of time has elapsed since the release first occurred, adjustments should be made to historical data to account for changes that have occurred as a result of causes other than the release

CERCLA Guidelines cont. (§11.72c)

- One or more of the following general sources of historical baseline data may be used
  - EISs/EAs or similar documents - studies in support of EISs/EAs, etc.
  - Appropriate literature
  - Computerized data bases
  - Information from public/private landholders
  - Trustee sponsored studies
  - Federally sponsored research
  - Academic studies
  - Other sources as appropriate

CERCLA Guidelines cont. (§11.72d)

- Where historical data are not available for the assessment area or injured resource or do not meet the previous requirements, baseline data should be collected from **control areas**
- Historical data for a control area should be used if available and if they meet the guidelines (next slide)
- Otherwise, baseline must be defined by field data from the control area

CERCLA Guidelines cont. (§11.72d)

- Field and historical data should conform to all the following guidelines:
  - Control area(s) must be selected based upon similarity to the assessment area and lack of exposure to the release
  - Where the release occurs in a medium flowing in a single direction (e.g., river), at least one control area upstream or up current of the assessment area must be considered
  - The comparability of each control area to the assessment area must be demonstrated, to the extent technically feasible
  - Data must be collected from the control area over a period sufficient to estimate normal variability in the characteristics being measured and should represent at least one full cycle normally expected in that resource

CERCLA Guidelines cont. (§11.72d)

- Field and historical data should conform to all the following guidelines (cont.)
  - Methods used to collect data at the control area must be comparable to those used at the assessment area, and must be subject to quality assurance provisions
  - Data collected at the control area should be compared to values reported in the literature for similar resources to demonstrate that the data represent a normal range of conditions
  - A control area may be used for determining the baseline for more than one kind of resource, if sampling and data collection for each resource do not interfere with sampling and data collection for the other resources

OPA Guidelines (§990.30)

- Baseline data may be estimated using:
  - Historical data
  - Reference data
  - Control data
  - Data on incremental changes, e.g., counts of oiled bird carcasses can be used as a basis for quantifying incremental bird mortality
  - Alone or in combination, as appropriate

OPA Guidelines (Guidance Doc.)

- OPA rule does not distinguish between baseline, historical, reference, or control data in terms of value and utility in determining the degree and spatial and temporal extent of injuries
- Types of information that may be useful in evaluating baseline include:
  - Information collected on a regular basis and for a period of time from and prior to the incident
  - Information identifying historical patterns or trends on the area of the incident and injured natural resources and services
  - Information from areas unaffected by the incident, that are judged sufficiently similar to the area of the incident with respect to the parameter being measured
  - Information from the area of the incident after particular natural resources or services have been judged to have recovered

SOME CHALLENGES

Some Challenges to Baseline Assessments

- What are the most appropriate metrics to examine to assess baseline conditions?
- Do we need multiple baseline points/sites? How many baseline points/sites is enough?
- How much evidence do we need to assess injury relative to baseline, i.e., weight of evidence?
- How can we optimally tweak the effects of a release/discharge from confounding environmental and human effects?
- How do we confidently assess baseline relative to intrinsic natural fluctuations? How far do we go to understand these fluctuations? Do we consider extrinsic events, e.g., unusual storm events?

Some Challenges to Baseline Assessments cont.

- How do we soundly assess the quality of historic or past studies that may be applicable?
- What if no site-specific or other relevant opportunities or information exist, i.e., urban soups?
- How much time and money are we willing to expend collecting and assessing baseline data?
- Are we looking at the appropriate resources, metrics, etc?
- Are there other surrogates to get where we need to go?

The Baseline Quandary

- Baseline is the target we are attempting to achieve
- Baseline is the condition we need to establish despite the injury
- However, baseline may be impractical or too time-consuming and costly to assess

POSSIBLE SOLUTIONS

When Baseline is Practical

- Consider existing applicable and appropriate information that meets quality standards or can be readily extrapolated
- Use a range of metrics
- Consider multiple baseline points or sites
- Consider baseline as a range of “normal” environmental and human conditions
- Bear in mind that baseline analyses must be linked to the injury and be cost-reasonable
- Think about pre-planning opportunities – as suggested under the OPA rule
- Recognize that, even in the best of circumstances, we are still approximating conditions……

But, When Baseline is *&^%$#?

- Maybe it is because we are shooting for the wrong goal
- Perhaps the goal should be defined based on the public's values and desired use of the resource, i.e., What can we live with?
- Possibilities to consider include:
  - Characterizing nature and extent of the injury (damage assessment)
  - Setting the restoration goal
  - Establish a metric(s) to relate to resource improvement
  - Establish time and area boundaries
  - Establish the means for the system to improve
- Consider cleanup, restoration and source control (pollution prevention)

THE END!!!