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Standard Guide for Surveys to Document and Assess Oiling Conditions on Shorelines[1]

This standard is issued under the fixed designation F1686; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers field procedures by which data may be collected in a systematic manner to document and assess the oiling conditions on shorelines.

1.2 This guide does not address the terminology that is used to define and describe shoreline oiling conditions, the ecological character of oiled shorelines, or the cultural or other resources that may be present.

1.3 The guide is applicable to marine coasts (including estuaries) and may also be used in freshwater environments (rivers and lakes).

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1687 Guide for Terminology and Indices to Describe Oiling Conditions on Shorelines

3. Significance and Use

3.1 Systematic surveys provide data on shoreline character and oiling conditions from which informed planning and operational decisions may be developed with respect to shoreline cleanup (**1-3**).[3]

3.2 Surveys may include one or more of three components, listed below. The scale of the affected area and the availability of pre-spill information will influence the selection of survey components and the level of detail.

3.3 The aerial reconnaissance survey provides a perspective on the overall extent and general nature of the shoreline oiling conditions. This information is used in conjunction with environmental, resource, and cultural sensitivity data to guide shoreline protection, recovery of mobile oil, and to facilitate the more detailed response planning and priorities of the response operations.

3.4 The aerial video survey(s) provide systematic audio and video documentation of the extent and type of shoreline oiling conditions, physical shoreline character, and potential access restrictions.

3.5 The ground assessment survey(s) provide the necessary information and data to develop appropriate shoreline response recommendations. A field team(s) collects detailed information on shoreline oil conditions, the physical and ecological character of oiled shorelines, and resources or cultural features that may affect or be affected by the timing or implementation of response activities.

3.6 In order to ensure data consistency it is important to use standardized terminology and definitions in describing oiling conditions, as provided in Guide F1687.

4. General Considerations

4.1 The specific survey procedures and the magnitude of the data sets collected will vary with the scale of the spill (the length and distribution of oiled shoreline and quantity of oil), the nature or complexity of the shoreline, and the needs of the response organization (**1**).

4.2 Following a spill in which only a few kilometers of coast have been oiled, one ground survey team may be able to accomplish all of the goals in an appropriate time frame.

4.3 As the scale of the affected area increases, it may be necessary to conduct an aerial video survey that is followed by a ground assessment using one or more teams.

4.4 Following spills that affect long sections of coast (for example, more than 100 km), the sequence of an initial aerial reconnaissance, an aerial video survey and ground assessment

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The boldface numbers in parentheses refer to the list of references at the end of this standard.

surveys may be necessary to satisfy planning and operational requirements in a timely manner.

4.5 Each of the three stages requires a separate survey design, the assignment of duties to personnel, logistics planning, and the establishment of survey and documentation procedures.

4.6 All surveys are conducted during the lowest one-quarter to one-third of the tidal cycle to ensure maximum (viewing) exposure of the intertidal zone.

5. Segmentation

5.1 The coast is divided into working units called segments, within which the shoreline character is relatively homogeneous in terms of physical features and sediment type.

5.2 Each segment is assigned a unique location identifier (for example, an alpha-numeric code).

5.3 Segment boundaries can be either prominent geological features (headlands, streams, etc.), changes in shore/substrate types, or, more importantly, alongshore changes in oil conditions.

5.4 Segment lengths are short enough to obtain adequate resolution and detail on the distribution of the oil for planning and operational decisions. Most segments of oiled shorelines would be in the range of 0.2 to 2.0 km.

5.5 If segments already exist as part of a pre-spill planning exercise or sensitivity mapping database, segment boundaries may need to be adapted, segments subdivided, or the segment codes revised, or some combination thereof, to reflect the oiling conditions created by a spill.

6. Aerial Reconnaissance Survey(s)

6.1 An initial aerial survey(s) is conducted along coastlines within the spill path. The objective is to determine which shorelines have been oiled, in order to provide an overall perspective and scale with which to plan for a more systematic documentation or assessment survey.

6.2 This survey can be augmented with information from a high-altitude surveillance and tracking program. In some cases this survey can be combined with other aerial reconnaissance activities being conducted to locate and visually observe oil on water (Practice).

6.3 Fixed-wing or rotary-wing aircraft fly the coast at slow-speed flight at altitudes in the range of 75 to 150 m. Helicopters are preferred over fixed-wing aircraft, as they permit landings to confirm observations made from the air. Among fixed-wing aircraft, those with the wing mounted above the fuselage (high-wing aircraft) are essential to allow the required visibility of shoreline features.

6.4 If possible, the survey team will consist of an oil observer and navigator/recorder. The observer should be an oil-spill specialist familiar with oil on shorelines and able to distinguish between natural materials (stranded kelp, black lichen, heavy mineral bands, etc.) and oil. The navigator logs the flight lines, locates a section of shoreline on maps or charts, and records oil observations.

6.5 Records of observations may be made on maps and notebooks. Video and still photography can also be used to add a visual record of examples of the oiling conditions and shoreline character for immediate use by planners and decision makers.

6.6 An aerial reconnaissance is generally not required where the presence of oil on the shore has been defined clearly from other sources or where the affected coastline is short enough in length that an aerial video survey can be completed during one low-tide cycle.

7. Aerial Video and Mapping Survey(s)

7.1 The aerial video recording and mapping survey(s) are conducted on coasts where there is known or expected oiling. The survey is used to provide detailed and systematic documentation on the extent and type of shoreline oiling and other shoreline conditions.

7.2 Small high-wing or rotary-wing aircraft fly the coast at very slow speeds at altitudes in the range of 25 to 75 m.

7.3 The primary survey team consists of an oil observer and a navigator. The navigator records and maps relevant flight information. The oil observer operates the video camera and provides a continuous audio commentary, for which the color video image provides a visual image frame of reference. In some cases a video technician may be desirable for the operation and quality control of the audio and video recordings.

7.4 The oil observer/videographer is an oil-spill specialist, who can identify the shoreline substrate and form and distinguish between natural shoreline materials and stranded oil. Duties of the oil observer are as follows:

7.4.1 To identify or create segment boundaries and describe their location on one of the audio channels. These are also recorded on a set of flight-line maps or charts by the navigator.

7.4.2 To video the shore zone through an open door or window continuously, with the camera angled down (30 to 45°) and slightly ahead of the aircraft (15 to 30°) so that the area being described comes into focus and the foreground during the commentary. Video resolution is best when the sun is behind the aircraft.

7.4.3 To provide a continuous descriptive commentary on the shoreline oiling conditions, including the (*1*) length and width of the oiled areas and the oil distribution (percent surface oil cover), (*2*) physical shore-zone character, and (*3*) other pertinent features such as access locations or constraints.

7.5 Video recording equipment requires either a camera/recorder/color monitor system or a camrecorder system. Both must have on-screen date/time, audio recording, and lowlight recording capabilities. Other requirements include an independent, stabilized power supply or converter and a voice-activated two-channel audio recording and communications system between all crew members, including the pilot. Also desirable is the capability for location (geographical positioning system) overprint on the image, a stabilized camera mount, and small inboard color monitor(s).

8. Ground Assessment Survey(s)

8.1 Shoreline ground assessment surveys are conducted on oiled and unoiled segments within the affected area that may