

STRAIT OF JUAN DE FUCA AND
NORTHERN PUGET SOUND,
WASHINGTON
ENVIRONMENTAL SENSITIVITY
DATA
METADATA

September 1996

National Oceanic and Atmospheric Administration
Hazardous Materials Response and Assessment Division
7600 Sand Point Way, NE
Seattle, Washington 98115

FILE DESCRIBES: Digital Environmental Sensitivity data for the Strait of Juan de Fuca and Northern Puget Sound, Washington compiled by the National Oceanic and Atmospheric Administration, Seattle, Washington in 1996.

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COMMENTS: Information was developed using the U.S. Federal Geographic Data Committee's Content Standards for Digital Geospatial Metadata, June 8, 1994. The numbering scheme matches the Metadata Standard in order to facilitate referencing definitions of the elements. The items in **bold** are required elements and the others are optional elements. The Spatial Data Transfer Standard (SDTS), ver. 03/92, was referenced to properly identify the geographic entities.

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1.0. IDENTIFICATION INFORMATION

1.1. CITATION

1.1.1. ORIGINATOR:

National Oceanic and Atmospheric Administration (NOAA), Office of Ocean Resources Conservation and Assessment, Hazardous Materials Response and Assessment Division, Seattle, Washington 98115.

1.1.2. PUBLICATION DATE:

199609

1.1.4. TITLE:

Strait of Juan de Fuca and Northern Puget Sound, Washington—Environmental Sensitivity Data

1.1.5. EDITION:

First

1.1.6. GEOSPATIAL DATA PRESENTATION FORM:

Maps

1.1.7. SERIES INFORMATION

1.1.7.1. SERIES NAME:

None

1.1.7.2. ISSUE IDENTIFICATION:

Strait of Juan de Fuca and Northern Puget Sound, Washington

1.1.8. PUBLICATION INFORMATION

1.1.8.1. PUBLICATION PLACE:

Seattle, Washington

1.1.8.2. PUBLISHER:

NOAA, Office of Ocean Resources Conservation and Assessment, Hazardous Materials Response and Assessment Division

1.1.9. OTHER CITATION DETAILS:

Prepared by the Hazardous Materials Response and Assessment Division, NOAA, Seattle, Washington for NOAA; U.S. Coast Guard, Seattle, Washington; and Washington Department of Fish and Game.

1.1.11. LARGER WORK CITATION:

None

1.2. DESCRIPTION

1.2.1. ABSTRACT:

This data set comprises the Environmental Sensitivity Index (ESI) maps for the shoreline of the Strait of Juan de Fuca and Northern Puget Sound, Washington. These data characterize coastal environments by their sensitivity to spilled oil. The data include information for shoreline habitats.

1.2.2. PURPOSE:

The data were collected, mapped, and digitized to provide environmental data for oil spill planning and response. The Clean Water Act with amendments by the Oil Pollution Act of 1990 requires response plans for immediate and effective protection of sensitive resources

1.3. TIME PERIOD OF CONTENT

1.3.1. TIME PERIOD INFORMATION

1.3.1.3. RANGE OF DATES/TIMES:

The intertidal habitats were mapped during aerial and ground surveys conducted in 1984. The dates for these data vary and are documented in Section 2.5.1

1.4. STATUS

1.4.1. PROGRESS:

Complete

1.4.2. MAINTENANCE AND UPDATE FREQUENCY:

None planned

1.5. SPATIAL DOMAIN

1.5.1. BOUNDING COORDINATES

1.5.1.1. WEST BOUNDING COORDINATE:

-124.75°

1.5.1.2. EAST BOUNDING COORDINATE:

-121.09°

1.5.1.3. NORTH BOUNDING COORDINATE:

49.05°

1.5.1.4. SOUTH BOUNDING COORDINATE:

47.39°

1.6 KEYWORDS

1.6.1. THEME

1.6.1.1. THEME KEYWORD THESAURUS:

None

1.6.1.2. THEME KEYWORD:

Sensitivity maps; coastal resources; oil spill planning; and coastal zone management

1.6.2. PLACE

1.6.2.1. THESAURUS:

None

1.6.2.2. PLACE KEYWORD:

Strait of Juan de Fuca and Northern Puget Sound, Washington

1.7. ACCESS CONSTRAINTS:

None

1.8. USE CONSTRAINTS:

DO NOT USE ESI MAPS FOR NAVIGATIONAL PURPOSES.

Besides the above warning, there are no use constraints on this data. Acknowledgment of NOAA and other contributing sources would be appreciated in products derived from these data.

1.11. DATA SET CREDIT:

This project was supported by NOAA's Hazardous Materials Response and Assessment Division, Robert Pavia, Project Manager.

Shoreline and habitat data were digitized by Marine Spill Response Corporation (MSRC).

Research Planning, Inc. provided overlays and guidance to MSRC for the habitat digitization.

Data were processed by NOAA to derive a topologically clean data set and assign additional shoreline attributes.

Genwest Systems, Inc. checked the shoreline types against the hard copy atlas.

Review of the hard copy maps was performed by E. O. Coates and LCDR T. G. M. Balunis (U.S. Coast Guard); Clifford Bosley, Glenn Gately, Bill Hellelbart and Ralph Webber (U.S. Fish and Wildlife Service); Linda M. Knuze (Washington Natural Heritage Program); Kelly R. McAllister (Evergreen State College); and Steven M. Speich.

2.0. DATA QUALITY INFORMATION

2.1. ATTRIBUTE ACCURACY

2.1.1. ATTRIBUTE ACCURACY REPORT:

The attribute accuracy is estimated to be “good” given the years of ESI experience, the data input methodology, the quality control review sessions, and the digital logical consistency checks. There has been no quantitative accuracy assessment.

2.2. LOGICAL CONSISTENCY REPORT:

The data were originally digitized by MSRC using a CAD system. NOAA converted these data to ARC/INFO[®] coverages and cleaned up the data to obtain a topologically clean shoreline cover. Shoreline arcs were assigned a source_id to indicate whether the arc was retained from the MSRC data set, or whether they were extensions added to obtain closure. Additionally, arcs were assigned a line type based on whether they represented a shoreline, hydrography or pier feature. Polygons were assigned an attribute water_code to differentiate between land and water features. Using a series of algorithms and arcedit functions, arcs digitized in the ESI cover were matched to the shoreline and the ESI value was transferred to the corresponding segment of the shoreline cover. In dealing with polygonal features such as flats and marshes, arcs corresponding to the shoreline side were deleted and the actual shoreline was utilized instead. This is to insure that the shoreline presented in the ESI cover is a replica of the shoreline given in the hydro cover.

Data was run through a translator to an independent mapping program. The translator has checks that assure all data items are of the proper type and that they have a valid value assigned. Computerized maps were then compared to the hard copy atlases for correctness and completeness. Any discrepancies were corrected on the ARC/INFO[®] coverage. Final checks for topological correctness and data completeness were then performed.

2.3. COMPLETENESS REPORT:

The maps were intended to provide a regional overview of the environmentally sensitive shoreline habitats of the Strait of Juan de Fuca and Northern Puget Sound, Washington.

Shoreline Habitat Mapping:

Prediction of the behavior and persistence of oil on intertidal habitats is based on an understanding of the dynamics of the coastal environments, not just the substrate type and grain size. The vulnerability of a particular intertidal habitat is an integration of the following factors:

- 1) Shoreline type (substrate, grain size, tidal elevation, origin)
- 2) Exposure to wave and tidal energy
- 3) Biological productivity and sensitivity
- 4) Ease of cleanup

All of these factors are used to determine the relative sensitivity of intertidal habitats. Key to the sensitivity ranking is an understanding of the relationships between: physical processes; substrate; shoreline type; product type; fate and effect; and sediment transport patterns. The intensity of energy expended upon a shoreline by wave action, tidal currents, and river currents directly affects the persistence of stranded oil. The need for shoreline cleanup activities is determined, in part, by the slowness of natural processes in removal of oil stranded on the shoreline.

These concepts have been used in the development of the ESI, which ranks shoreline environments as to their relative sensitivity to oil spills, potential biological injury, and ease of cleanup. Generally speaking, areas exposed to high levels of physical energy, such as wave action and tidal currents, and low biological activity rank low on the scale, whereas sheltered areas with associated high biological activity have the highest ranking.

2.4. POSITIONAL ACCURACY

2.4.1. HORIZONTAL POSITIONAL ACCURACY

2.4.1.1. HORIZONTAL POSITIONAL ACCURACY REPORT:

The ESI data uses USGS 1:24,000 topographic quadrangles as the base map. It is estimated that the ESI has a minimum mapping unit of 50 feet.

2.5. LINEAGE

2.5.1. SOURCE INFORMATION:

Coverage or theme name: Eelgrass

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
MSRC	1994	Digital versions of U.S.G.S. quads	Digital CAD files	N/A	1:24,000	Varies

2.5.1. SOURCE INFORMATION:

Coverage or theme name: ESI

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
NOAA and Research Planning Inc. (RPI)	1984	Sensitivity of coastal environments and wildlife to spilled oil, Strait of Juan de Fuca and Northern Puget Sound: an atlas of coastal resources	Hard copy, maps	NOAA, Office of Ocean Resources Conservation and Assessment, Seattle, WA, 86 maps	1:24,000	1984
Michel, J. and J. Dahlin, RPI	1993	Guidelines for Developing Digital Environmental Sensitivity Index Atlases and Data-bases	Hard copy, text	Hazardous Materials Response and Assessment Division, NOAA, Seattle, WA, 43 pp. + appendices	N/A	1993
MSRC	1994	Digital ESI data	Digital CAD files	Unpublished	1:24,000	1984
NOAA	1996	Digital ESI data	Digital polygons and chains	N/A	1:24,000	1984
Automobile Club of America.	1976	Olympic Peninsula (including Puget Sound) travel recreation map.	Hard copy, map	Automobile Club of America, Map No. W6913	Unknown	Unknown
Collias, E. E. and S. I Andreeva	1977	Puget Sound marine environment, an annotated bibliography	Hard copy, text	Unknown	N/A	Unknown

STRAIT OF JUAN DE FUCA METADATA

English, T. S.	1976	Oil pollution and the significant biological resources of Puget Sound, final report field survey	Hard copy, text	Washington Department of Ecology, Olympia, Washington	N/A	Unknown
Gardner, F. (Ed.)	1978	Northern Puget sound baseline program, 1974-1977	Hard copy, text	Washington Department of Ecology, Olympia, Washington, 82 pp.	N/A	1974-1977
Gundlach, E. R., C. D. Getter and M. O. Hayes	1980	Sensitivity of coastal environments to spilled oil, Strait of Juan de Fuca and northern Puget Sound	Hard copy, text	Research Planning Institute, Columbia, South Carolina, RPI/R/80/3/5-8, Report to NOAA MESA, 76 pp.	N/A	Unknown
Kopenski, R. P. and E. R. Long	Unknown	An environmental assessment of northern Puget Sound and the Strait of Juan de Fuca - a summary	Hard copy, text	Draft Report, NOAA MESA, Seattle, Washington	N/A	Unknown
Office of Marine Pollution Assessment.	1981	A summary of knowledge of Puget Sound related to chemical contaminants	Hard copy, text	NOAA OMPA. Boulder, Colorado, NOAA Technical Memorandum OMPA-13	N/A	Unknown
Phinney, L. A. and P. Bucknell	1975	A catalog of Washington streams and salmon utilization	Hard copy, text	Department of Fisheries, Olympia, Washington, Vol. 1-Puget Sound	N/A	Unknown
U. S. Army Corps of Engineers	1975	Washington environmental atlas	Hard copy, maps	Environ. Resources Sect., Seattle Dist. Seattle, Washington, 115 pp.	Unknown	Unknown
U. S. Fish and Wildlife Service	1979	Classification of wetlands and deepwater habitats of the United States	Hard copy, text	U. S. Department of the Interior, Washington, D.C., Publication No. FWS/OBS-79/31	N/A	Unknown
U. S. Fish and Wildlife Service	1980	Puget Sound habitat protection map	Hard copy, map	Department of the Interior, Ecological Services, Olympia, Washington	Unknown	Unknown
U. S. Fish and Wildlife Service	1981	Pacific Coast ecological inventory, user's guide and information base	Hard copy, text	Biological Services Program, Washington, D.C., Publication No. FWS/OBS-781/30, 159 pp.	N/A	Unknown

STRAIT OF JUAN DE FUCA METADATA

Washington Department of Ecology	1977	Coastal zone atlas of Washington	Hard copy, maps	Publication No. DOE 77-21-1, Vols. 4, 5, 6, 7, 10, and 11	N/A	Unknown
Washington Department of Ecology	1981	Washington coastal areas of major biological significance	Hard copy, text	F. Gardner (Ed.), Baseline Studies Program, Olympia, Washington, 631 pp.	N/A	Unknown
Washington Department of Natural Resources	1974	Washington marine atlas.	Hard copy, maps	Division of Marine Land Management. 4 vols.	Unknown	Unknown
Washington Department of Natural Resources	1983	Current concentration sites of kelp and eelgrass within greater Puget Sound	Hard copy, maps	Unpublished	Unknown	Unknown
Albright, R. R., Hirschi, C. Vanbianchi and C. Vita	1980	Coastal zone atlas of Washington - land cover/land use narratives, Vol. I - Urban, agriculture, non-forested uplands, forest, water	Hard copy, text	Department of Ecology, Olympia, Washington, 447 pp.	N/A	Unknown
Albright, R. R., Hirschi, C. Vanbianchi and C. Vita	1980	Coastal zone atlas of Washington - land cover/land use narratives, Vol. II - Wetlands, exposed and other lands, appendices, glossary, index	Hard copy, text	Department of Ecology, Olympia, Washington, 448-887 pp.	N/A	Unknown
National Ocean Survey	1982	U. S. Coast Pilot, Volume 7, Pacific Coast: California, Oregon, Washington and Hawaii, 18th Edition,	Hard copy, text	U. S. Department of Commerce, NOAA, NOS, Riverdale, Maryland, pp. 287-325	N/A	Unknown
National Ocean Survey	Varies by map	Nautical charts 18400, 18423, 18425, 18427, 18428, 18429, 18430, 18431, 18432, 18433, 18440, 18441, 18443, 18460, 18464, 18465, 18467, 18468, 18480, 18484, 18485	Hard copy, maps	U. S. Department of Commerce, NOAA, NOS, Riverdale, Maryland	Unknown	Unknown

STRAIT OF JUAN DE FUCA METADATA

Nyblade, C. F.	1977	Baseline study program - northern Puget Sound intertidal study: Appendix F	Hard copy, text	Washington Department of Ecology, Olympia, Washington, 451 pp.	N/A	Unknown
Nyblade, C. F.	1978	The intertidal and shallow subtidal benthos of the Strait of Juan de Fuca, spring 1976 - winter 1977	Hard copy, text	Marine Ecosystems Analysis Program, Boulder, Colorado, NOAA Technical Memorandum ERL - MESA-26, 156 pp.	N/A	1976-1977
Nyblade, C. F.	1979	The Strait of Juan de Fuca intertidal and subtidal benthos, second annual report, spring 1977 - winter 1978	Hard copy, text	DOC/EPA Interagency Energy/Environment R&D Program Report EPA-600/7-79-213, U.S. Environmental Protection Agency. Washington, D.C., 129 pp.	N/A	1977-1978
U. S. Fish and Wildlife Service.	1981	Dungeness National Wildlife Refuge	Hard copy, text	Olympia, Washington, Pamphlet #796-119 (81-32)	N/A	Unknown
U. S. Fish and Wildlife Service.	1980	San Juan Islands - National Wildlife Refuge and Wilderness area. Nisqually National Wildlife Refuge	Hard copy, text	Olympia, Washington, Pamphlet #796-119 (81-31)	N/A	Unknown
Washington Department of Ecology	1978	North Puget Sound baseline program 1974-1977	Hard copy, text	Baseline Studies Program, Olympia, Washington, 82 pp.	N/A	1974-1977
Webber, H. H.	1979	The intertidal and shallow subtidal benthos of the west coast of Whidbey Island, spring 1977 to winter 1978, first year report	Hard copy, text	NOAA Technical Memorandum ERL-MESA-37, Marine Ecosystems Analysis Program, Environmental Research Laboratories, Boulder, Colorado, 108 pp.	N/A	1977-1978

Webber, H. H.	1980	Whidbey Island intertidal and shallow subtidal benthos	Hard copy, text	DOC/EPA Interagency Energy/Environment R&D Program Report EPA-60/7-80-167, U.S. Environmental Protection Agency, Washington, D.C., 91 pp. + microfiche appendix	N/A	Unknown
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2.5.1. SOURCE INFORMATION:

Coverage or theme name: Hydro

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
U.S.G.S.	Varies	7.5 minute topographic maps	Hard copy, maps	U.S.G.S., Reston, VA	1:24,000	Varies
MSRC	1994	Digital versions of U.S.G.S. quads	Digital CAD files	N/A	1:24,000	Varies
NOAA	1996	Digital U.S.G.S. quads	Digital polygons and chains	N/A	1:24,000	Varies

2.5.1. SOURCE INFORMATION:

Coverage or theme name: Kelp

2.5.1.1. SOURCE CITATION

2.5.1.1.1 Originator	2.5.1.1.2 Publication Date	2.5.1.1.4 Title	2.5.1.1.6 Geospatial Data Presentation Form	2.5.1.1.8 Publication Information	2.5.1.2 Source Scale Denominator	2.5.1.4 Source Time Period
MSRC	1994	Digital versions of U.S.G.S. quads	Digital CAD files	N/A	1:24,000	Varies

2.5.2. PROCESS STEP

2.5.2.1. PROCESS DESCRIPTION:

The data were originally digitized by MSRC using a CAD system. NOAA converted these data to ARC/INFO[®] coverages and cleaned up the data to obtain a topologically clean shoreline cover. Shoreline arcs were assigned a source_id to indicate whether the arc was retained from the MSRC data set, or whether they were extensions added to obtain closure. Additionally, arcs were assigned a line type based on whether they represented a shoreline, hydrography or pier feature. Polygons were assigned an attribute water_code to differentiate between land and water features. Using a series of algorithms and arcedit functions, arcs digitized in the ESI cover were matched to the shoreline and the ESI value was transferred to the corresponding segment of the shoreline cover. In dealing with polygonal features such as flats and marshes, arcs corresponding to the shoreline side were deleted and the actual shoreline was utilized instead. This is to insure that the shoreline presented in the ESI cover is a replica of the shoreline given in the hydro cover.

Data was run through a translator to an independent mapping program. The translator has checks that assure all data items are of the proper type and that they have a valid value assigned. Computerized maps were then compared to the hard copy atlases for correctness and completeness. Any discrepancies were corrected on the ARC/INFO[®] coverage. Final checks for topological correctness and data completeness were then performed.

2.5.2.3. PROCESS DATE:

199608

2.5.2.6. PROCESS CONTACT

2.5.2.6.1. CONTACT PERSON PRIMARY

2.5.2.6.1.1. CONTACT PERSON:

Jill Petersen

2.5.2.6.1.2. CONTACT ORGANIZATION:
NOAA HMRAD

2.5.2.6.3. CONTACT POSITION:
GIS Manager

2.5.2.6.4. CONTACT ADDRESS

2.5.2.6.4.1. ADDRESS TYPE:
Physical Address

2.5.2.6.4.2. ADDRESS:
7600 Sand Point Way N.E.
Bin C15700

2.5.2.6.4.3. CITY:
Seattle

2.5.2.6.4.4. STATE OR PROVINCE:
W A

2.5.2.6.4.5. POSTAL CODE:
98115

2.5.2.6.7. CONTACT FACSIMILE TELEPHONE:
(206) 526-6329

2.5.2.6.8. CONTACT ELECTRONIC MAIL ADDRESS:
jill_petersen@hazmat.noaa.gov.us

3.0. SPATIAL DATA ORGANIZATION INFORMATION

3.2. DIRECT SPATIAL REFERENCE METHOD:

Vector

3.3. POINT AND VECTOR OBJECT INFORMATION

3.3.1. SDTS TERMS DESCRIPTION:

3.3.1.1. SDTS POINT AND VECTOR OBJECT TYPE, and

3.3.1.2. POINT AND VECTOR OBJECT COUNT:

BASEMAP

Theme	Universe Polygon	GT-Polygons	Area Points	Complete Chains	Line Segments	Label Points	Entity Points	Nodes
Eelgrass	1	276	276	303	14,350	0	0	303
ESI	1	562	562	3,056	121,005	0	0	2,908
Hydro	1	459	459	1,502	116,725	0	0	1,481
Kelp	1	219	219	256	7,999	0	0	256

4.0. SPATIAL REFERENCE INFORMATION

4.1. HORIZONTAL COORDINATE SYSTEM DEFINITION

4.1.1 GEOGRAPHIC

4.1.1.1 LATITUDE RESOLUTION:

0.00005

4.1.1.2 LONGITUDE RESOLUTION:

0.00005

4.1.1.3 GEOGRAPHIC COORDINATE UNITS:

Decimal Degrees

4.1.4. GEODETIC MODEL

4.1.4.1. HORIZONTAL DATUM NAME:

North American Datum of 1927

4.1.4.2. ELLIPSOID NAME:

Clark 1866

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5.0. ENTITY AND ATTRIBUTE INFORMATION

5.1. DETAILED DESCRIPTION: EELGRASS

The Coverage EELGRASS contains polygonal (GT-Polygons) and arc (Complete Chains) features for the ESI shoreline classification. The classification of the features is based upon *Environmental Sensitivity Index Guidelines* (NOAA, 1995, NOAA Technical Memorandum NOS ORCS 92, Hazardous Materials Response and Assessment Division, NOAA, Seattle, Washington).

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>Complete Chain</u>	ESI character LINE character SOURCE_ID integer
<u>GT-Polygons</u>	ESI character WATER_CODE character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ESI

5.1.2.2. ATTRIBUTE DEFINITION:

The item ESI contains values according to the ESI ranking of the shorelines and polygons.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
U	Undefined

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:Ordered

5.1.2.1. ATTRIBUTE LABEL:

LINE

5.1.2.2. ATTRIBUTE DEFINITION:

Type of geographical feature

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

F	Flat
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5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

5.1.2.1. ATTRIBUTE LABEL:

SOURCE_ID

5.1.2.2. ATTRIBUTE DEFINITION:

Data source for EELGRASS

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

1	MSRC digital data (corrected as needed to match original hard copy atlas)
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5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

5.1.2.1. ATTRIBUTE LABEL:

WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:

Specifies a polygon as water

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

W	Water
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5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1. DETAILED DESCRIPTION: ESI

The Coverage ESI contains polygonal (GT-Polygons) and arc (Complete Chains) features for the ESI shoreline classification. The classification of the features is based upon *Environmental Sensitivity Index Guidelines* (NOAA, 1995, NOAA Technical Memorandum NOS ORCS 92, Hazardous Materials Response and Assessment Division, NOAA, Seattle, Washington). The ESI classification was performed in 1984.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:

5.1.1.2. ENTITY TYPE DEFINITION:

<u>Complete Chain</u>	ESI	character
	LINE	character
	SOURCE_ID	integer
<u>GT-Polygons</u>	ESI	character
	WATER_CODE	character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ESI

5.1.2.2. ATTRIBUTE DEFINITION:

The item ESI contains values according to the ESI ranking of the shorelines and polygons. The ESI rankings progress from low to high susceptibility to oil spills. The Strait of Juan de Fuca and Northern Puget Sound, Washington shoreline types are listed below. In many cases, the shorelines are also

ranked with multiple codes, such as 10/7. The first number is the most landward shoreline type, marshes, with exposed sandy tidal flats being the shoreline type closest to the water.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
1	Exposed rocky headlands
1/2	Exposed rocky headlands/Wave-cut platforms
2	Wave-cut platforms
2/7	Wave-cut platforms/Exposed tidal flats
2/11	Wave-cut platforms/(Unranked) Man-made structures
3	Pocket beaches along exposed rocky shores
3/2	Pocket beaches along exposed rocky shores/Wave-cut platforms
4	Sand beaches
4/7	Sand beaches/Exposed tidal flats
5	Sand and gravel beaches (mobile sediments)
5/2	Sand and gravel beaches (mobile sediments)/Wave-cut platforms
5/7	Sand and gravel beaches (mobile sediments)/Exposed tidal flats
5/8	Sand and gravel beaches (mobile sediments)/Sheltered rocky shores
5/9	Sand and gravel beaches (mobile sediments)/Sheltered tidal flats
5/11	Sand and gravel beaches (mobile sediments)/(Unranked) Man-made structures
6	Sand and cobble beaches (stable sediments) and riprap structures
6/7	Sand and cobble beaches (stable sediments) and riprap structures/Exposed tidal flats
7	Exposed tidal flats
8	Sheltered rocky shores
8/7	Sheltered rocky shores/Exposed tidal flats
8/11	Sheltered rocky shores/(Unranked) Man-made structures
9	Sheltered tidal flats
9/5	Sheltered tidal flats/Sand and gravel beaches (mobile sediments)
10	Marshes
10/7	Marshes/Exposed tidal flats
10/9	Marshes/Sheltered tidal flats

11	(Unranked) Man-made structures
11/5	(Unranked) Man-made structures/Sand and gravel beaches (mobile sediments)
11/5/9	(Unranked) Man-made structures/Sand and gravel beaches (mobile sediments)/Sheltered tidal flats
11/6	(Unranked) Man-made structures/Sand and cobble beaches (stable sediments) and riprap structures
11/7	(Unranked) Man-made structures/Exposed tidal flats
11/9	(Unranked) Man-made structures/Sheltered tidal flats
U	Undefined
U/7	Undefined/Exposed tidal flats
U/9	Undefined/Sheltered tidal flats
U/11	Undefined/(Unranked) Man-made structures

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:Ordered

5.1.2.1. ATTRIBUTE LABEL:

LINE

5.1.2.2. ATTRIBUTE DEFINITION:

Type of geographical feature

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

H	Hydrography or stream features
S	Shoreline
F	Flat
P	Pier or breakwater
B	Breakwater

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

5.1.2.1. ATTRIBUTE LABEL:

SOURCE_ID

5.1.2.2. ATTRIBUTE DEFINITION:

Data source for ESI

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

1	MSRC digital data (corrected as needed to match original hard copy atlas)
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5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:

nominal

5.1.2.1. ATTRIBUTE LABEL:

WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:

Specifies a polygon as either water or land

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:

5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:

W	Water
L	Land

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1. DETAILED DESCRIPTION: HYDRO

The Coverage HYDRO contains polygonal water and land features as well as linear features for rivers/streams that are tidally influenced.

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>GT-Polygons</u>	WATER_CODE character
<u>Complete Chains</u>	LINE character
	SOURCE_ID character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:

Specifies a polygon as either water or land.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
W	Water
L	Land

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.1. ATTRIBUTE LABEL:

LINE

5.1.2.2. ATTRIBUTE DEFINITION:

Type of geographical feature

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
H	Hydrography or stream features
S	Shoreline
P	Pier or breakwater
I	Index
B	Breakwater

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:
NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:
nominal

5.1.2.1. ATTRIBUTE LABEL:
SOURCE_ID

5.1.2.2. ATTRIBUTE DEFINITION:
Data source for HYDRO

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:
NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
11 15	As digitized by MSRC Added to obtain topologically closed cover or an index segment

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:
NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:
nominal

5.1. DETAILED DESCRIPTION: KELP

The Coverage KELP contains polygonal (GT-Polygons) and arc (Complete Chains) features for the ESI shoreline classification. The classification of the features is based upon *Environmental Sensitivity Index Guidelines* (NOAA, 1995, NOAA Technical Memorandum NOS ORCS 92, Hazardous Materials Response and Assessment Division, NOAA, Seattle, Washington).

5.1.1. ENTITY TYPES:

5.1.1.1. ENTITY TYPE LABEL:	5.1.1.2. ENTITY TYPE DEFINITION:
<u>Complete Chain</u>	ESI character LINE character SOURCE_ID integer
<u>GT-Polygons</u>	ESI character WATER_CODE character

5.1.2. ATTRIBUTES:

5.1.2.1. ATTRIBUTE LABEL:

ESI

5.1.2.2. ATTRIBUTE DEFINITION:

The item ESI contains values according to the ESI ranking of the shorelines and polygons.

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
U	Undefined

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:

NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:Ordered

5.1.2.1. ATTRIBUTE LABEL:

LINE

5.1.2.2. ATTRIBUTE DEFINITION:

Type of geographical feature

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:

NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
F	Flat

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:
NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:
nominal

5.1.2.1. ATTRIBUTE LABEL:
SOURCE_ID

5.1.2.2. ATTRIBUTE DEFINITION:
Data source for KELP

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:
NOAA

5.1.2.4.1.1. ENUMERATED DOMAIN VALUE:	5.1.2.4.1.2. ENUMERATED DOMAIN VALUE DEFINITION:
1	MSRC digital data (corrected as needed to match original hard copy atlas)

5.1.2.4.1.3. ENUMERATED DOMAIN VALUE DEFINITION SOURCE:
NOAA

5.1.2.5. ATTRIBUTE UNITS OF MEASUREMENT:
nominal

5.1.2.1. ATTRIBUTE LABEL:
WATER_CODE

5.1.2.2. ATTRIBUTE DEFINITION:
Specifies a polygon as water

5.1.2.3. ATTRIBUTE DEFINITION SOURCE:
NOAA

**5.1.2.4.1.1. ENUMERATED
DOMAIN VALUE:**

**5.1.2.4.1.2. ENUMERATED DOMAIN
VALUE DEFINITION:**

W

Water

**5.1.2.4.1.3. ENUMERATED DOMAIN VALUE
DEFINITION SOURCE:**

NOAA

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6.0. DISTRIBUTION INFORMATION

6.1. DISTRIBUTOR

6.1.1. CONTACT PERSON PRIMARY

6.1.1.1. CONTACT PERSON:

Robert Pavia

6.1.1.2. CONTACT ORGANIZATION:

NOAA

6.1.4. CONTACT ADDRESS

6.1.4.1. ADDRESS TYPE:

Physical Address

6.1.4.2. ADDRESS:

7600 Sand Point Way N.E., Bin C15700

6.1.4.3. CITY:

Seattle

6.1.4.4. STATE OR PROVINCE:

W A

6.1.4.5. POSTAL CODE:

98115

6.1.7. CONTACT FACSIMILE TELEPHONE:

(206) 526-6329

6.1.8. CONTACT ELECTRONIC MAIL ADDRESS:

robert_pavia@hazmat.noaa.gov.us

6.2. RESOURCE DESCRIPTION:

Strait of Juan de Fuca and Northern Puget Sound,
Washington—Environmental Sensitivity Data

6.3. DISTRIBUTION LIABILITY:

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6.5. CUSTOM ORDER PROCESS

Contact NOAA for distribution options (see 6.1.1.).

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7.0. METADATA REFERENCE INFORMATION

7.1. METADATA DATE:

199609

7.2. METADATA REVIEW DATE:

199609

7.4. METADATA CONTACT

7.4.1. CONTACT PERSON PRIMARY

7.4.1.1. CONTACT PERSON:

Jill Petersen

7.4.1.2. CONTACT ORGANIZATION:

NOAA HMRAD

7.4.3. CONTACT POSITION:

GIS Manager

7.4.4. CONTACT ADDRESS

7.4.4.1. ADDRESS TYPE:

Physical Address

7.4.4.2. ADDRESS:

7600 Sand Point Way, N.E., Bin C15700

7.4.4.3. CITY:

Seattle

7.4.4.4. STATE OR PROVINCE:

Washington

7.4.4.5. POSTAL CODE:

98115

7.4.7. CONTACT FACSIMILE TELEPHONE:

(206) 526-6329

7.4.8. CONTACT ELECTRONIC MAIL ADDRESS:

jill_petersen@hazmat.noaa.gov.us

7.5. METADATA STANDARD NAME:

Content Standards for Digital Geospatial Metadata

7.6. METADATA STANDARD VERSION:

19940608