

**Report: Oregon Submersible and Submerged
Lands Ownership and Leasing
Spatial Data Assessment and Development
V.1**

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**The Nature Conservancy
National Oceanic and Atmospheric Administration
- Coastal Services Center**

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Other documents produced as part of the larger collaborative project include:

- Marine Land Ownership and Leasing Spatial Database Template
- Massachusetts Spatial Data Assessment
- Exploring a New Strategy for Marine Protection: An analysis of laws, policies, and practices related to private conservation of tidelands in Massachusetts
- Assessment of Law, Policy, and Practice Related to Private Conservation of Oregon Submerged and Submersible Lands

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Table of Contents

Acknowledgements	I
Table of Contents	II
Figures	III
Tables	III
1. Introduction	1
Figure 1: Submersible and Submerged Lands	1
Figure 2: Oregon Coast	2
2. Findings	2
Table 1: Summary of Project Findings	3
2.1 Human Impacts	3
2.2 Jurisdictional Boundaries	4
Figure 3: Approximation of MLW line	6
2.3 State Authorizations	6
2.3.1 Oil and Gas Well Permits	6
2.3.2 Aquaculture Leases	7
Table 2: Information status for ODA shellfish plat leases	7
Figure 4: Yaquina Bay Aquaculture Leases	8
2.3.3 Ocean Shore Permit	9
Figure 5: Ocean Shores Permits	10
2.3.4 Department of State Lands Authorizations	10
2.4 Ownership	11
2.4.1 Tax Parcel and Assessor Data	11
Table 3: County tax parcel and assessor data contacts	11
Figure 6: Yaquina Bay Parcel Ownership	12
2.4.2 Estuary Ownership	12
2.5 Physical and Biological	13
2.6 Regulated Uses	13
2.6.1 County Zoning	13
2.6.2 Estuary Management Units	14
2.7 Restrictions	14
Figure 7: Marine Managed Areas	15
3. Conclusions	15
3.1 Submersible and Submerged Lands	15
3.2 Public and Private Ownership	16
3.3 Individual Parcel Owners	17
3.4 Uses via Leases, Licenses, Permits, etc	17
3.5 Protected/Management Status	17
3.6 Natural Features	17
4. Recommendations	17

Figures

[Figure 1: Submersible and Submerged Lands.....](#)

[Figure 2: Oregon Coast.....](#)

[Figure 3: Approximation of MLW line.....](#)

[Figure 4: Yaquina Bay Aquaculture Leases.....](#)

[Figure 5: Ocean Shores Permits.....](#)

[Figure 6: Yaquina Bay Parcel Ownership.....](#)

[Figure 7: Marine Managed Areas.....](#)

Tables

[Table 1: Summary of Project Findings.....](#)

[Table 2: Information status for ODA shellfish plat leases.....](#)

[Table 3: County tax parcel and assessor data contacts.....](#)

1. Introduction

Spatial data was collected, assessed, and developed during a one-year project period with the following anticipated uses in mind:

- To initiate and facilitate discussions with state submersible and submerged land managers regarding conservation strategies and activities.
- To identify opportunities for private conservation leasing and ownership.
- To illustrate the relative proportion and distribution of private ownership and leasing activities on submersible and submerged lands within state jurisdictions.

The geographic scope of the project was limited to submersible and submerged lands (see Figure 1) on the outer coast of Oregon extending seaward three nautical miles, including the bays and estuaries, that lie under tidally influenced saltwater (see Figure 2).

Figure 1: Submersible and Submerged Lands



Broad data categories were developed for organizational purposes, including:

- Jurisdictional Boundaries;
- State Authorizations;
- Ownership;
- Physical and Biological;
- Regulated Uses; and
- Restrictions.

Figure 2: Oregon Coast



Most of the data collection, assessment, and development efforts undertaken as part of the project are reviewed in this report. However, because of relevancy, data quality, or availability, only a select amount of data was included in The Nature Conservancy Oregon Submerged and Submersible Lands Conservation geodatabase.

2. Findings

A tabular summary of the major quantifiable project findings are included in Table 1. The project determined that there are approximately one million acres of submersible and submerged lands on Oregon's coast, including the bays and estuaries. Of these, approximately 17% are within estuaries, 32% of which are privately owned. It is

assumed that 100% of the submerged lands on the outer coast, outside of estuaries, are publicly owned.

Table 1: Summary of Project Findings¹

Issue	Oregon
Lands lying between high tide line and state's seaward jurisdictional limit	No specific term: 1,016,000 acres
Intertidal lands: Lands lying between high tide line and low tide line	➤ Submersible Lands: acres not discernable with current data
Subtidal lands: Lands lying between low tide line and the state's seaward jurisdictional limit	➤ Submerged Lands: acres not discernable with current data
Area within estuaries	➤ 17,266 acres (17% of total)
Area within "Protected Status"	➤ Unknown: analysis not conducted
Existing Private Ownership	➤ 5,481 acres (32% of all estuaries) of intertidal and subtidal lands within estuaries ➤ Unknown % of intertidal lands on outer coast (analysis not conducted) ➤ 0% of subtidal lands on outer coast
Existing Public Ownership	➤ 11,785 acres (68% of all estuaries) of intertidal and subtidal lands within estuaries ➤ ³ Unknown % of intertidal lands on outer coast (analysis not conducted) ➤ 100% of subtidal lands on outer coast

2.1 Human Impacts

“Human impacts” encompass a large array of data, and as similar efforts are repeated in other states, different data sets may be chosen according to specific needs or site characterization. Data clearinghouses such as Oregon’s Coastal Atlas (www.coastalatlus.net) provide detailed digital data on many aspects of human impacts. The Nature Conservancy Oregon Submerged and Submersible Lands Conservation geodatabase includes three datasets which are national in scope: National Pollution Discharge Elimination System (NPDES) permits, dredged material disposal sites, and Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) sites.

¹ All figures in table are approximations and should not be cited without the appropriate caveats found within the individual state project reports.

NPDES permits, authorized under the Clean Water Act, regulate the discharge of point source pollutants into surface waters.² The “Point_Pollution” feature class included in the geodatabase captures point locations of permitted discharges (in the form of pipes, man-made ditches, etc.) from Oregon industries, municipalities, and other facilities. NPDES permit data originated from the following NOAA web site:
ftp://sposerver.nos.noaa.gov/datasets/CADS/GIS_Files/ShapeFiles/

The geodatabase’s “Dredged_Material_Disposal” feature class provides information about the location and extent of dredge material disposal sites in the following Oregon estuaries: Alsea Bay, Chetco, Columbia River, Coquille, Rogue River, Siletz River, Siuslaw, Umpqua River, Yaquina River, Coos Bay, Nehalem River, and Tillamook Bay. Sources include the Oregon Coastal Atlas and Tillamook County’s GIS Coordinator, David Barbour (for Nehalem River and Tillamook Bay coverage). Although not included in the geodatabase, the Environmental Protection Agency (EPA) provides information on Ocean Dumping Sites for dredged material, and has a map of Ocean Dumping Sites in EPA Region X.³

The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database contains information on “hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation.”⁴ Sites included are on the National Priorities List (NPL) or being considered for the NPL.³ Polygon locations of CERCLIS sites for Oregon’s Coquille Watershed, Grays Elokoman Watershed, Rogue Watershed, Siltcoos Watershed, Siletz Yaquina Watershed, Siuslaw Watershed, Sixes Watershed, Umpqua Watershed, Wilson Trask Nestucca Watershed, and Coos Watershed originate from the Oregon Coastal Atlas and are depicted in the geodatabase’s “Contaminated_Sites” feature class.

2.2 Jurisdictional Boundaries

Jurisdictional boundaries found with relative ease and included in the geodatabase are the coastal counties of Oregon, the Territorial Sea, and the Public Land Survey System (PLSS). As some state and county data are geographically referenced using PLSS townships, sections, and lots; including the PLSS locations of features may aid with interagency communications. In addition, features with no geographic coordinates may be specified ballpark or zonal to their corresponding PLSS block. This may become especially important when trying to incorporate older hardcopy records into a spatial geodatabase. PLSS data was downloaded from GeoCommunicator Land Survey Information System web site (www.geocommunicator.gov). Coastal county boundary data originates from the National Atlas of the United States (www.nationalatlas.gov). The Territorial Sea shapefile is from Oregon Department of State Lands’ GIS Manager, Randy Sounhein.

² EPA *National Pollutant Discharge Elimination System* <http://cfpub.epa.gov/npdes/> (last viewed 9/1/06).

³ EPA *Ocean Dumping Sites for Dredged Material* <http://www.epa.gov/owow/oceans/regulatory/dumpdredged/oceansites.html> (last viewed 9/5/06).

⁴ EPA *Superfund Information Systems* <http://www.epa.gov/superfund/sites/cursites/> (last viewed 9/1/2006).

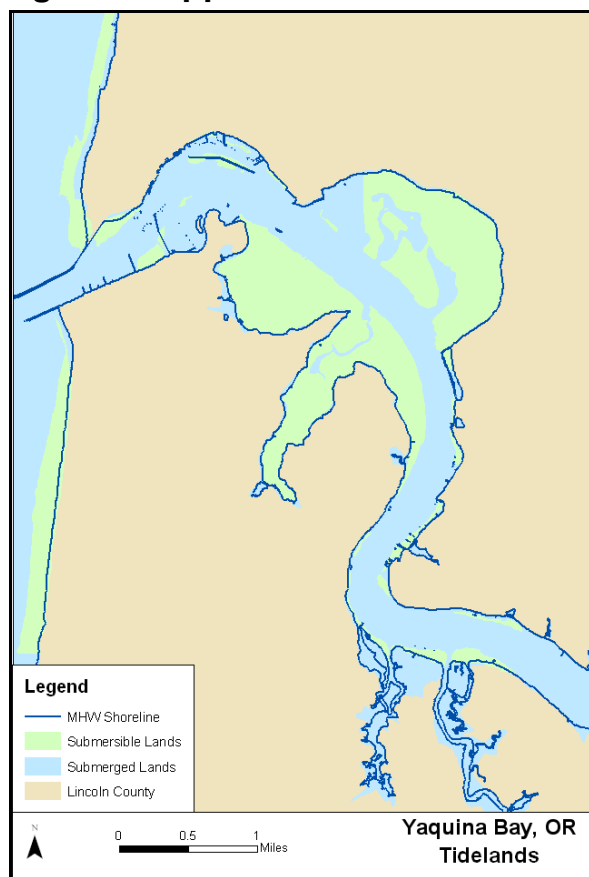
Obtaining accurate shoreline data proved challenging. NOAA Coastal Services Center provides high-resolution vector shoreline data from scanned historical shoreline maps.⁵ Mean high water (MHW) shoreline data is available to download in polygon or line format. Shoreline data in polygon format is advantageous for performing “clips” of other data in Geographical Information Systems (GIS). The NOAA shoreline data does not have complete coverage of many of the Oregon estuaries, although it is sufficient for open ocean stretches of shoreline. MHW shoreline data created by The Nature Conservancy’s Pacific Northwest Coast Ecoregional Assessment has better coverage of bays, estuaries, and inlets; and is the shoreline used in the geodatabase. The two discussed datasets have significant differences and offsets in some locations. These differences may be due to differing scales, dates of creation, original sources for the data, and accretion or erosion of land along the Oregon coast.

Additional sources of shoreline data were nautical charts, as land and river polygons, as well as coastline data can be extracted. The NOAA Electronic Navigational Charts (ENCs) can be downloaded from: http://nauticalcharts.noaa.gov/csdl/ctp/encdirect_new.htm. Aerial photos could also be used to assist in delineating shorelines, although the tidal stage and date would need to be noted.

A mean low water line (MLW) was difficult to find, as most shoreline data is created to the MHW line. It is possible, however, to approximate submersible lands by extracting a MLLW line from NOAA charts in their Shoreline Vector Data Product. Unfortunately, MLLW is not MLW, and in areas of gradual slope, the horizontal differences may be significant. Because extracting MLLW is a labor-intensive process, it was only completed for a pilot area in and around Yaquina Bay, as an illustration (see Figure 3). Figure 3 shows submersible lands along the coast, and in the bay itself, with extensive submersible lands outside the main course of the river. Note that submersible lands do not appear to touch the MHW shore north of the bay’s mouth. This is likely the result of pulling data from two different data sources at different scales.

⁵ NOAA Coastal Services Center *Shoreline Data* <http://www.csc.noaa.gov/shoreline/index.html> (last viewed 9/1/2006).

Figure 3: Approximation of MLW line



2.3 State Authorizations

2.3.1 Oil and Gas Well Permits

The Oregon Department of Geology and Mineral Industries (DOGAMI) administers oil and gas well permits. The oil and gas regulatory program supervises “drilling, production, maintenance, abandonment and reclamation of oil and gas exploratory, development and service wells and seismic and information holes drilled for exploration for oil and gas.”⁶ An excel file, Oil and Gas Well Permits/Locations, is located on DOGAMI’s website: <http://www.oregongeology.com/sub/oil/oilhome.htm>. The excel file is relatively current except for the omission of ten new well applications by MEC in Coos Bay.⁷ The Nature Conservancy (TNC) collected hard copies of the ten MEC “Application to Drill Oil or Gas Well,” obtained from DOGAMI Petroleum-Geothermal Geologist/ Natural Resource Specialist, Bob Houston. However, only one hardcopy MEC application contains latitude and longitude fields. The other wells are referenced by surveyed SHL and BHL coordinates.

⁶ DOGAMI *The Oil, Gas and Geothermal Regulatory and Reclamation Program at DOGAMI* <http://www.oregongeology.com/sub/oil/oilhome.htm> (last viewed 9/1/06).

⁷ Phone conversation with Bob Houston, Petroleum-Geothermal Geologist/ Natural Resource Specialist, DOGAMI (July 21, 2006).

Using the longitude and latitude provided for some wells in the excel file, point locations of wells in coastal counties were plotted. Of the wells mapped, none appear in tidal lands or directly adjacent to water, and were therefore not included in the geodatabase. Further work could be done to obtain latitude and longitude descriptors for every well application, or to map a ballpark well location based on surveyed or PLSS descriptions.

The shapefile, Oilwells (TNC-CSC Sept. 06 Data CD; "OilWells" folder), from the Oregon Coastal Atlas depicts oil well locations off the Oregon coast as of 1990. All of these wells fall outside of the Territorial Sea, in federal waters, and were not included in the geodatabase. The Oregon Department of State Lands (DSL) and Oregon Land Board would have to approve drilling or exploration in Oregon waters.

2.3.2 Aquaculture Leases

The Oregon Department of Agriculture (ODA) holds hardcopy records with legal descriptions and maps of state shellfish plat leases. Lessee information is included in records. During a visit to ODA, hardcopy information was copied for all 21 Yaquina Bay leases and 70% (15) of the leases in Netarts Bay (see summary status of hardcopy and digital data in Table 2). Lease details were captured in the excel spreadsheet, DptofAg.xls, located on TNC_CSC Sept. 06 Data CD, "Excel" folder. Umpqua River shellfish leases remain to be copied. ODA also has records for Tillamook Bay, but as Tillamook County's David Barbour provided digital data for 15 plats, 34 tracts of oyster leases, this information was not copied. Diana Walker, GIS coordinator for ODA, reported that there were ODA leases in Coos Bay and South Slough, although hardcopy records were not readily evident in ODA files. Diana Walker confirmed that there were no leases in Salmon River or Siletz Bay. She suggested contacting Deb Cannon, ODA's Shellfish Food Safety person, to locate any additional leases, as lease holders would need to get a permit from Food Safety. Individual counties may also have information on aquaculture leases, as they grant land use permits to lease holders.⁸

Table 2: Information status for ODA shellfish plat leases

County	Estuary	ODA Leases Exist	ODA Hardcopy Records Available	Copies of ODA Records Made	Digital Data Received or Developed
Coos	Coos Bay	yes	no	0%	0%
	South Slough	yes	no	0%	0%
Douglas	Umpqua River	yes	yes	0%	0%
Lincoln	Yaquina Bay	21	21	100%	100%
Tillamook	Netarts Bay	21	21	70% (15)	0%
	Tillamook Bay	34	34	0%	100%

* No leases exist in Salmon River or Siletz Bay; other estuaries should be checked for leases.

⁸ Email from Diana Walker, GIS Coordinator, ODA (July 13, 2006).

Using the ODA shellfish plat lease data collected, a digital record for Yaquina Bay leases was created (see Figure 4). The shellfish plat shapes were created from legal descriptions (employing the traverse tool in ArcMap) and overlapping features in Lincoln County tax lot data. The digital data has limitations, as the legal descriptions upon which it was based can be vague and confusing. This time-consuming data creation process could be replicated for other ODA hardcopy records, or the option of digitizing could be evaluated. Data creation for Netarts Bay leases will be a faster process, as Tillamook county tax lot data already includes many of the shellfish plat shapes.

Figure 4: Yaquina Bay Aquaculture Leases



The digital record of Yaquina Bay shellfish leases, as well as Tillamook Bay shellfish leases, are available in the geodatabase under the “Lease_License_Easement” feature dataset as an “Aquaculture_Lease” feature class.

2.3.3 Ocean Shore Permit

The Oregon Parks and Recreation Department (OPRD) is responsible for permitting “any construction or other beach alteration activities in the ocean shore area.”⁹ The feature class “Ocean_Shore_Permit” in the geodatabase captures locations of 208 unpermitted and permitted shoreline protection structures along the Oregon coast (see Figure 5). “Ocean_Shore_Permit” has a polyline geometry formed by a connection of GPS endpoints of protection structures. Attributes of this feature class include shoreline protection structure type (i.e. riprap, concrete sea wall); total height, width, and length of structure; geomorphology; and OPRD permit number. There is an attribute field with a DSL number and permit type, although the origins of this field are unclear. The “Ocean_Shore_Permit” feature class is a compilation of shapefiles produced as a product of the Oregon Sea Grant 2002 Resource Fellowship, and was obtained through Steve Williams, Coastal Shores Specialist for Oregon Department of Land Conservation and Development. Further methodology and information about Oregon’s shoreline protection structures is found in the hardcopy report *Erosion Control on Oregon’s Ocean Shore: A Hard Look at Coastal Shore Protection Structures*, Oregon Sea Grant 2002 Resource Fellowship, Maggie Sommer, October, 2002. In addition, OPRD has the permit decisions of seventeen Ocean Shore Alteration Permits on their website, <http://egov.oregon.gov/OPRD/RULES/regulatory-permitdecisions.shtml>. The permit decisions include the following information: data, applicant, project location in some cases described by assessor’s map tax lot number, project description, and conditions.

⁹ *Erosion Control on Oregon’s Ocean Shore: A Hard Look at Coastal Shore Protection Structures*, Oregon Sea Grant 2002 Resource Fellowship, Maggie Sommer, p. 1 (2002).

Figure 5: Ocean Shores Permits



2.3.4 Department of State Lands Authorizations

A hardcopy list of proprietary authorizations was provided by Kevin Moynahan of DSL. Twenty-two records span activities in the territorial sea and include waterway leases, aquaculture leases, public facility licenses, rights of entry, and easements. The only location identifier is by PLSS block, and five records are lacking this information.

The hardcopy Proprietary Authorization List Report is hardly comprehensive, as the companion report *Assessment of Law, Policy, and Practice Related to Private Conservation of Oregon Submerged and Submersible Lands* states there are currently about 400 waterway leases. Perhaps the Proprietary Authorization List Report only has open ocean records, excluding authorizations in bays, estuaries, rivers, and lakes.

Obtaining location and use information for all waterway leases is a priority, as the above mentioned companion report lists waterway leases among one of most relevant and promising mechanisms for conservation. Currently, the lease locations are not in a digital format for GIS¹⁰. Additional information of interest DSL might hold includes submerged/submersible lands restricted or closed to leasing, applicable permits, a more comprehensive proprietary authorization list, water structure registration, and sand/gravel licenses or leases.

¹⁰ Phone conversation with Randy Sounhein, GIS Manager, DSL (August 17, 2006).

Initial data requests with DSL resulted in 2005 Color Imagery covering the Oregon coastline and estuaries (not included in geodatabase; CDs from Randy Sounhein), the Territorial Sea boundary, hardcopy proprietary easements discussed above, and an estuary ownership shapefile which will be discussed at greater lengths in the ownership section.

2.4 Ownership

2.4.1 Tax Parcel and Assessor Data

Digital tax parcel and assessor data is available for all seven Oregon coastal counties and was collected as part of this project (Table 3). Information captured in the geodatabase feature dataset "Ownership" includes: parcel location address; property class; owner name and address; and owner type. Curry, Douglas, Lane, Lincoln, and Tillamook County tax parcels are clipped to the coast by a prescribed distance, showing only parcels adjacent to the water, while tax parcel data for Clatsop and Coos County parcels information cover the entirety of each county.

Table 3: County tax parcel and assessor data contacts

County	Contact
Clatsop	Jeri Ponder
Tillamook	David Barbour
Lincoln	John Waffenschmidt
Lane	Michael Schindel TNC OR
Douglas	Kathy Thompson; Chuck Perino
Coos	Laurie Burke
Curry	Toni Fisher

Some parcels extend seaward of the mean high water line while other parcels exist entirely in submerged/submersible land. Land parcels adjacent to water may not all have the same seaward boundary in part due to ambulatory boundaries.¹¹ Typically, land parcels adjacent to bays and estuaries are more likely to extend into the water than land parcels adjacent to the open ocean.¹⁰

Spatial precision and accuracy is doubtful for the county tax parcel data. Specifically:

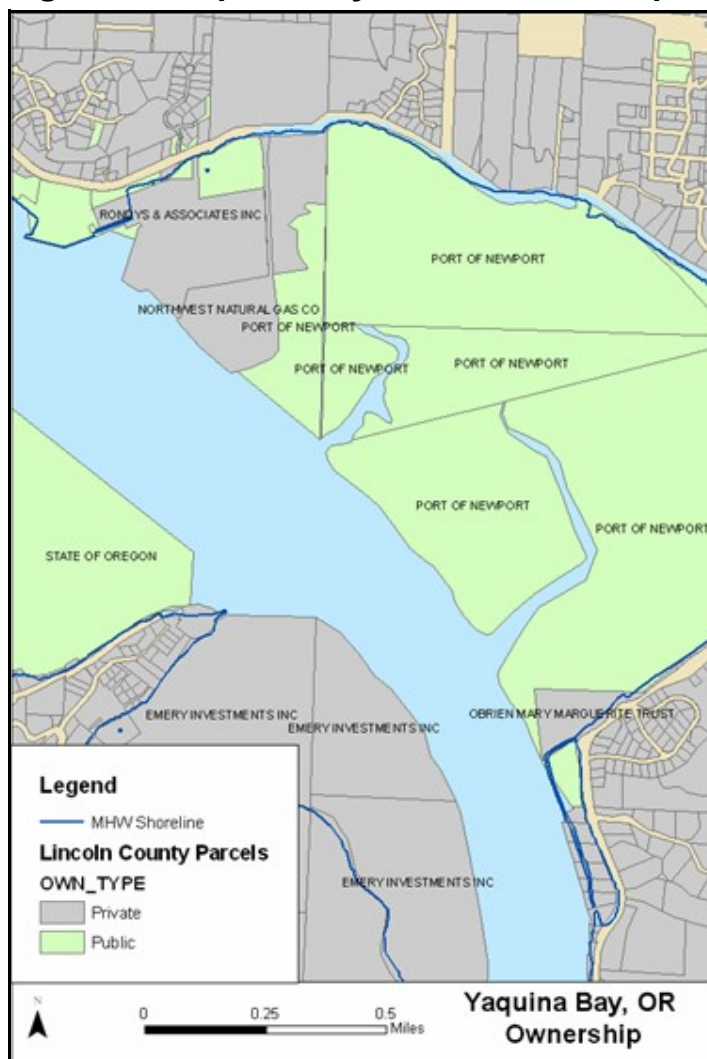
- John Waffenschmidt, GIS manager for Lincoln County, was clear about the limitations of data he provided. He did not guarantee spatial precision or accuracy and did not provide metadata.
- The accuracy of Clatsop County data is unknown, but is the most current data they had to offer.

¹¹ Phone conversation with Tonya Haddad, DLCD (June 2006).

- According to the GIS coordinator at Lane County, the spatial precision of the dataset is not guaranteed – it could be up to 200 feet off, depending on the location. Lane County is currently working on a revised, more spatially precise version of this dataset that should be ready for public release by year’s end.

Figure 6 shows an example of parcel ownership identification for Yaquina Bay.

Figure 6: Yaquina Bay Parcel Ownership



2.4.2 Estuary Ownership

Feature class “Estuary_Ownership” under the geodatabase “Ownership” feature dataset, is a DSL provided shapefile that categorizes submersible and submerged land estuary ownership as private, Oregon (state), and other. The shapefile includes all Oregon bays and estuaries, but some records have a blank ownership field. Randy Souhein of DSL said the estuary ownership shapefile is from 1997 and for that date, it

was comprehensive. However, there are some inconsistencies between tax parcel ownership information and the estuary ownership information. The estuary ownership features do not conform to the same shape as tax parcels, but tend to encompass larger, more generalized blocks of land.

2.5 Physical and Biological

Similar to “Human Impacts,” there are many options and easily accessible data for the “Physical and Biological” category. Each state project will likely incorporate datasets that best fit their objectives. The Northwest Ecoregional geodatabase created by TNC’s Zach Ferdaña, as well as the Oregon Coastal Atlas, are good additional data sources.

A general hydrology layer depicting the territorial sea, bays, and coastal rivers was provided by TNC Washington Chapter¹².

A tidal wetland dataset was found at the Oregon Coastal Atlas website. As described in the metadata published by Oregon State University: This data set is intended for use as an inventory of existing wetland functions for use with the hydrogeomorphic classification of Oregon’s tidal wetlands. It is also intended for use in checking areas that may warrant further consideration for restoration of tidal circulation as needed to enhance anadromous fish habitat and other wetland functions. The layer also provides information of potential use to researchers for selecting tidal wetland sites for intensive studies and baseline information of potential use to planners for tracking possible future changes of tidal wetlands.

2.6 Regulated Uses

2.6.1 County Zoning

Land use zoning data was collected on the county level, using the same contacts as utilized for obtaining tax parcel data ([Table 3](#)). All zoning data is captured in the geodatabase “Regulated_Uses” feature data set. Separate zoning shapefiles exist for Curry, Douglas, Clatsop, and Lincoln Counties. Zoning for Lane and Coos Counties is included as an attribute in their tax parcel data. For the geodatabase feature dataset “Regulated_Uses”, zoning was extracted from the tax parcel data and made into a separate feature class. Digital land use zoning is not currently available for Tillamook County, but GIS Coordinator David Barbour said they are in the process of digitizing the data. Curry County’s GIS Coordinator, Toni Fisher, was reluctant to distribute their zoning data, as she cautioned that it is not very accurate and should only be used as a ballpark reference.

If descriptions of the zoning codes are not included in the attribute table, they typically can be found on county websites.

¹² Personal contact with Jesse Langdon at TNC's Seattle Office.

2.6.2 Estuary Management Units

Local plans divide each estuary into a series of management units. “Each management unit is a discrete geographic area defined by biological and physical characteristics and features, within which particular uses and activities are promoted, encouraged, protected, or enhanced, and others are discouraged, restricted, or prohibited.”¹³ Oregon’s Statewide Planning Goal 16 defines three types of estuary management units: natural, conservation, and development.

The following estuary plans are available from the Oregon Coastal Atlas: Coos Bay, Alesia Bay, Chetco, Columbia River, Necanicum, Nehalem, Nestucca, Netarts, Rogue River, Salmon River, Sand Lake, Siletz River, Umpqua River, and Yaquina River. Tillamook County provided its own estuary zoning covering Tillamook Bay. The above information is captured in the geodatabase feature dataset “Regulated_Uses,” feature class “Estuary_Management_Units.”

2.7 Restrictions

The geodatabase feature class “Marine_Managed_Area” has polygons of Oregon’s federal and state marine managed areas, including National Wildlife Refuges, National Estuarine Research Reserves, conservation zones, research reserves, as well as marine gardens (downloaded from www.mpa.gov) (see Figure 7). Spatial data is missing for Netarts Bay Shellfish Preserve and Yaquina Bay Shellfish Preserve.

¹³ Oregon Estuary Plan Book: Management Unit Designation
http://www.inforain.org/mapsatwork/oregonestuary/oregonestuary_page6.htm (last viewed 9/6/2006).

Figure 7: Marine Managed Areas



3. Conclusions

The data collected for the Oregon project does not solitarily fulfill its intended purpose, but when utilized jointly in the geodatabase framework, questions and strategies towards marine conservation begin to formulate. As we begin to look holistically at Oregon’s submersible and submerged lands, understanding key concepts below will help us see the limitations and possibilities of the current Oregon spatial data.

3.1 Submersible and Submerged Lands

We can spatially identify the sum of both submersible (lands lying between the OHW line and the OLW line) and submerged tidelands (lands lying below the OLW line), although they are not separately distinguishable because we do not have an OLW line. The area covered by both submersible and submerged tidelands is that seaward of the MHW line to the boundary of the Territorial Sea. Using NOAA Shorelines polygon of the Oregon coast (orshrln.shp), which includes both the MHW line and the Territorial Sea, a

cumulative surface area of 1,016,452 acres (approximately one million acres) for submersible and submerged tidelands can be calculated.

3.2 Public and Private Ownership

There are currently several methods to identify public and private ownership of submersible and submerged lands. The estuary ownership shapefile (estuary.shp) from DSL covers submersible and submerged land in Oregon estuaries and identifies ownership as private, Oregon (state), or other. Although this shapefile depicts some open ocean ownership directly adjacent to estuaries, it is not a comprehensive picture of the entire Oregon coast. Utilizing the estuary ownership shapefile for calculations, Oregon (state) submersible and submerged land estuary ownership has a geographic surface area of 11,785 acres, while private submersible and submerged land estuary ownership has a geographic surface area of 5,481 acres.

ODA's shellfish plats (in digital format for Tillamook Bay and Yaquina Bay) can be categorized as state ownership. Tillamook Bay has 15 oyster plats subdivided into 34 tracts and covering 2,636 acres. The digital data for Yaquina Bay includes 19 of 21 total plats, with a geographic surface area of 381 acres.

Tax parcel data records can be categorized as public or private based upon characteristics of the ownership name. Tillamook County tax parcel data has been subdivided into county and state ownership (Tillamook_Countyland.shp; Tillamook_stateland.shp). Lincoln County tax parcel data was divided into city, federal, oyster, port, private, public, state, and "other" categories; these were further generalized to public or private ownership (Lincoln_parcel_city.shp, Lincoln_parcel_federal.shp, Lincoln_parcel_oyster.shp, Lincoln_parcel_port.shp, Lincoln_parcel_private.shp, Lincoln_parcel_public.shp, Lincoln_parcel_state.shp, Lincoln_parcel_other.shp). Parcel data was then clipped to the MHW line, leaving only sections of parcels located in submerged or submersible lands. Geographic surface area of public and private ownership in submersible and submerged lands was then calculated from these parcels. Geographic surface areas calculated in this manner are dependent on the accuracy of parcel data as well as the MHW line. In some situations, the parcel data clipped by the MHW line may inaccurately identify upland parcels as marine or vice versa. Following the above procedure, publicly owned submersible/submerged parcels in Lincoln County encompass 2,699 acres, while privately owned submersible/submerged parcels cover 3,224 acres.

There is some discrepancy between ownership type identified by DSL's estuary shapefile and public/private ownership as identified by county tax parcel data. The DSL data is supposedly comprehensive as of 1997, however tax parcel data is on a larger scale and should generally be thought of as more accurate than the DSL estuary shapefile.

3.3 Individual Parcel Owners

Individual parcel owners can be identified with county tax parcel and assessor data.

3.4 Uses via Leases, Licenses, Permits, etc.

Uses are identified by several data sources:

- Shellfish plat lease locations from ODA (digital data currently available for Tillamook Bay and Yaquina Bay; digital data possible for Netarts Bay and Umpqua River)
- OPRD Ocean Shore Permits and associated shoreline protection structures
- DSL Proprietary Authorization List Report (hardcopy only: possibility to reference locations to PLSS)
- Dredged Material Disposal Sites, County Zoning, and Marine Managed Areas may also be used to infer uses
- Waterway leases, water structure registration, comprehensive proprietary authorizations (including easements, right of entry, public facility licenses), and other applicable permits are held in non GIS format by DSL.

3.5 Protected/Management Status

Protected/management status is identified in the geodatabase “Restrictions” feature dataset, “Marine_Managed_Area” feature class.

3.6 Natural Features

Natural features are characterized by shoreline data, as well physical and biological properties such as wetland coverage and hydrology.

4. Recommendations

In summary, below is a prioritized list of potential activities that will make the Oregon Data Assessment more complete.

1. Obtain remaining data (highest priority: waterway leases) from DSL.
 - Covert data stored as hardcopy or in a spreadsheet to GIS format.
 - Geographically reference DSL Proprietary Authorizations to PLSS blocks.
2. Return to ODA:
 - Copy Umpqua River shellfish plat leases and the remaining Netarts Bay shellfish plat leases.
 - Inquire about possible hardcopy records for Coos Bay, South Slough, and any other estuaries.

- Cross-reference ODA Netarts Bay shellfish plat lease locations and Tillamook County tax parcels.
 - Add Netarts Bay shellfish plat lease attributes to the Tillamook County tax parcels depicting oyster beds.
 - Using legal descriptions, create a digital record of Umpqua River shellfish plat leases.
3. Complete metadata for the OR geodatabase.
 4. Create an Oregon MLW line or MLLW line from nautical charts.
 5. Acquire or create spatial data showing the boundaries of Netarts Bay Shellfish Preserve and Yaquina Bay Shellfish Preserve.
 6. Incorporate information into geodatabase/metadata from TNC's coastal ownership spreadsheets.¹⁴

¹⁴ Developed by a TNC intern, Season Long.