

An aerial photograph of a coastal area, likely Door County, Wisconsin, showing a road and buildings along the shoreline of Lake Michigan. The image is high-contrast and grainy.

**ASSESSING COASTAL  
DEVELOPMENT ALONG  
DOOR COUNTY'S  
LAKE MICHIGAN  
SHORELINE:  
1967-1978-1992**

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393  
.W6  
N54  
1995

**Prepared for the Wisconsin  
Coastal Management Program**

**July 1995**

Acknowledgements

**. FUNDED IN PART BY THE WISCONSIN COASTAL MANAGEMENT PROGRAM**

Financial assistance for this *Research/Study Project* was provided by the Coastal Zone Management Act of 1972, as amended, administered by the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration pursuant to grant #NA370Z0349 and the **WISCONSIN COASTAL MANAGEMENT PROGRAM**.

**THE WISCONSIN COASTAL MANAGEMENT PROGRAM**, part of Wisconsin Department of Administration, and overseen by the **WISCONSIN COASTAL MANAGEMENT COUNCIL**, was established in 1978 to preserve, protect and manage the resources of the Lake Michigan and Lake Superior coastline for this and future generations.

The Project Team

This project required coordination and completion of several steps including map documentation, photo preparation, photo interpretation, digital area/linear measurement and data sheet preparation. The following students worked as a team to help complete this project.

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Invaluable help was provided by Karen Katers to coordinate preparation of the manuscript and project data sheets, and to manage student employment records. Her contribution deserves special recognition as part of the project team.

Also, a special thanks is made to the U.S. Army Corps of Engineers who allowed access to the aerial photos used in this project.

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Assessing Coastal Development Along Wisconsin's  
Great Lakes Shoreline: 1978 - 1992

Coastal Management Program Contract No. 840005-501.15

INTRODUCTION

The Wisconsin Coastal Management Program mission includes developing an understanding of change along the state's Great Lakes shoreline. Such change, of course, can be natural or human-based. This study was undertaken to document natural and human-based development within the coastal zone of the state's Lake Michigan and Lake Superior shorelines. The Wisconsin legislature has defined coastal zone as land within 1,000' (304.8 meters) of the shoreline (Ordinary High Water Mark - OHWM).

Future coastal zone planning and risk assessment requirements defined the types of data to be collected. Assessment of risk to structures built in the coastal zone requires a temporal analysis of structural development and shoreline modification(s). Planning of the coastal zone requires, as well, determination of the natural resource base. This study utilized U.S. Army Corps of Engineers historic color aerial photographs taken in 1978 and 1992. For analysis of the coastal zone of Door County, 1967 photos obtained from the county planning department also were used.

This report documents both the original and amended contract to assess natural and developmental change within the coastal zone of Wisconsin's Great Lakes shorelines. Although the original contracted work was interrupted to include elements of the amended contract, no attempt will be made in this report to keep separate original vs. amended objectives, procedures or results. Goals of the amended contract include and expand those of the original.

PROJECT GOALS

Planning and assessment of hazards within the coastal zone defined the goals of this study. Within the Lake Michigan and Superior coastal zones, project goals included:

- Development of land use databases for 1978 and 1992 (and 1967 for Door County)
- Development of 1978 and 1992 databases of human modification of the shorelines (also 1967 for Door County)
- Develop a database of built structures for 1992

Additional goals included:

- Assess land use change within the coastal zone from 1978 to 1992 (from 1967 to 1992 for Door County)
- Assess human modification of the shoreline from 1978 to 1992 (from 1967 to 1992 for Door County)

STUDY AREA

The project study area comprises the Wisconsin portion of the Lake Michigan and Lake Superior coastal zone (Figure 1). In



Figure 1. Coastal Counties of Lake Michigan and Lake Superior

1982, the Wisconsin state legislature defined coastal zone as being that land within 1,000 feet (304.8 meters) of lake shoreline. Accordingly, the study area represents a 1,000' wide zone, the landward boundary of which is parallel to the coastline.

## PROJECT METHODS

### Aerial photography

Using aerial photos to assess coastal development requires clear statement of goals, appropriate definition of coastal zone, meaningful classification scheme, appropriate historical and current aerial photos, appropriate interpretation procedure and method of documentation, and trained personnel.

Application of aerial photography to assess urban and natural resource features is documented well (Smith, 1968; Avery and Berlin, 1985; Lo and Noble, 1990; Ciciarelli, 1991; Boge et al., 1992; Hinckley and Walker, 1993). Specific applications to urban/human activities cover a wide range including urban nonpoint pollution assessment (Kim and Ventura, 1993), gully erosion analysis (Welch et al., 1985), historical analysis of urban development into coastal wetlands (Niedzwiedz and Batie, 1984), identifying structural additions to urban residential property (Niedzwiedz, 1990), and studying agricultural land use (Marsh et al., 1990).

Aerial photos have been used to map archeological sites, urban features, and to document changes to the landscape (Smith, 1968). MacConnell (1975) reports the use of black and white aerial photography (scale 1:20000) to map 20 years of land use change within the state of Massachusetts, including the coastal zone. As part of a larger Great Lakes study, the International Joint Commission (1993) used 1:24000 scale photos to map land use features along the Berrien County, Michigan segment of the Lake Michigan shoreline. Results of the photo analysis were used to assess residential riparian erosion/recession rates caused by fluctuating water levels.

Wisconsin's coastal zone includes diverse land use, from forests and wetlands, to land devoted to agricultural or urban uses. The uses of aerial photos long have been applied to study such land uses. Befort and Viliman (1985) studied aerial photos to classify forest habitat. McCarthy et al. (1982) evaluated spruce-fir forests to aid management. Wetlands analysis is possible with aerial photos of appropriate format, scale and seasonal timing. Scarpace et al. (1981) used digitized aerial photos to map wetlands, while Ferguson et al. (1993) and Barrett and Niering (1993) have monitored sawgrass habitat and marsh vegetation change using aerial photos.

Extensive use of aerial photography has been directed at coastal resources. Scherz and Van Domelsen (1973) used aerial photos to help assess water quality in Lake Superior near Duluth, Minnesota. Numerous studies have been made with aerial photos to

aid management of coastal resources (Benton et al., 1978; Hill et al., 1985; Norton et al., 1985; Welch et al., 1992), to address change in coastal wetlands (Lyon and Greene, 1992), and to examine urban development into coastal wetlands (Niedzwiedz and Batie, 1984).

### Project Aerial Photos

In 1967, the Door County Planning Department obtained black and white vertical photos. These photos were flown on August 28<sup>th</sup> at a scale of 1:7920 (1" = 666') and enlarged to 1:3168 (1" = 264').

In 1978, the U.S. Army Corps of Engineers (USACE) obtained panchromatic color aerial photos of the Wisconsin portion of the Lake Michigan coastline. In 1992, USACE obtained color aerial photo coverage of the Wisconsin portion of both Lake Superior and Lake Michigan coastlines. Both the 1978 and 1992 photos were flown at a scale of 1:6000 (1" = 500') and enlargements made at 1:2400 (1" = 200'). The 1978 photos were taken April 16<sup>th</sup>. The 1992 photos were flown May 13<sup>th</sup>.

Unlike most historical aerial photos covering the same area and flown at the same scale, the USACE photos of 1978 and 1992 were not flown with coincident photo centers or coverage. No individual flight lines were documented for the 1978 photos. Beginning at the Michigan border, the 1978 photos were taken incrementally to the Illinois border. Photos are documented with the photo date and photo number on the northern edge of each photo.

Flight lines were documented for the 1992 photos. Flight line #1 begins just south of the Wisconsin-Illinois border. The northern edge of each 1992 photo displays the photo date, flight line and photo number.

The 1967 (1:7920), 1978 and 1992 photo contact prints (1:6000) were flown to produce stereo coverage of the coastline. Adjacent photos overlap (endlap) about 60% with each other. The enlarged photos (1:3168 for 1967 and 1:2400 for both 1978 and 1992) available for this study represent every other photo contact print, therefore, only photographic, not stereo coverage, is provided by the enlarged photos. Approximately 1,800 photos (1:2400) cover Wisconsin's Lake Michigan shoreline, 900 for each flight year. About 1,200 photos covering the shoreline from Marinette to Sheboygan are on file at the Green Bay office of USACE. The Waukesha office of USACE has on file about 600 photos covering the shoreline from Sheboygan to the Illinois border.

### Photo Preparation

Photos used in this study are owned by USACE and the Door County Planning Department. As a result, all photo documentation and interpretive work was applied to acetate affixed to each



photo. Preparing photos for interpretation included the following:

1. Affix label and document photo number/flight line, photo date and Public Land Survey System (PLSS) information.
2. Mark photo fiducials (orange ink). Fiducials allow the registration of acetate overlays to the photos, if required.
3. Mark control points (orange ink). Typically these points are road intersections and, or buildings, stable objects that could be referenced against controlled maps for future mapping applications.
4. Locate and mark interpretation boundary lines (black ink). These lines are used to denote a common boundary between adjacent photos. Land use interpretive lines end at these boundary lines, which eliminates redundant interpretive work.
5. Locate, mark and label PLSS section lines (red ink).
6. Locate, mark and label civil boundary lines (green ink).
7. Locate and mark 1,000' coastal zone boundary line (blue ink). A divider was used to scribe a line 1000' away and parallel to the line defined by land meeting water. In cases where large streams entered Lake Michigan, a straight dashed line was drawn to represent a continuation of the shoreline.
8. Locate and mark top of bluff, and bottom of bluff if slumpage is evident (black ink). In practice, these lines were not drawn until the shoreline portion of the classification scheme was applied to the photos. Refer to the section Photointerpretive Process (page 11) for additional discussion.

#### Aerial Photo Interpretation (API)

The landscape within the coastal zone can represent a complex mix of natural to urban uses. The land use classification scheme developed for this study addresses the complexity of Wisconsin's coastal zone. The scheme is a modification of the scheme developed by International Joint Commission (1993) and includes the general use categories of residential, commercial, industrial, transportation, extractive, agricultural, natural, open land and other uses. Land uses have been measured by area (acres, hectares). Structures per land use have been located and marked for spatial reference. Structures are tallied by type for 1992.

Modification of the shoreline also has resulted. Sea walls, revetments, groins and permanent docks have been constructed. Sea walls and revetments are linear types. Their interpretation and measurement are presented in feet (meters). Groins and docks were counted.

## CLASSIFICATION SCHEME

### Residential Land

All residential areas include infrastructure to service the area. Boundary placement is made to separate residential areas by type. No attempt is made to distinguish roads/streets from the residential areas they serve. This convention is true for other classification types as well.

- 111 Multi-Family: Medium to High Rise. Large residential structure of five (5) or more stories. Access roads, parking areas, open space and recreational facilities associated with the structure(s) would be included in the type.
- 112 Multi-Family: Low Rise. Large residential structures up to four (4) stories. Access roads, parking areas, open space and recreational facilities associated with the structure(s) would be included in the type.
- 113 Single Family, Duplex. Structures large and small used for residential use. The type includes lawn, landscaped areas, garage and driveways. Duplex structures are identified by twin driveways or a very wide driveway leading to an architecturally balanced structure.
- 115 Mobile Home Park. Residential area developed exclusively for mobile units.

### Commercial and Industrial Land

Commercial land includes three (3) types: central business district; shopping center/mall; and, neighborhood business district. Each type includes all building structures, access roads/streets, parking facilities and other features commonly associated with each type.

- 121 Central Business District (CBD). Commercial land predominantly used for distribution or merchandizing of goods and services. Stores, hotels, office buildings, parking facilities and smaller warehouses constitute the components of this type. The CBD spatially is tight, vegetation is rare.
- 122 Shopping Center/Mall. These commercial areas have developed away from the CBD. The type includes both "strip" type development and malls. Structures can range from large, flat roofed and rectangular (centers) to large, geometrically shaped. Both types include large parking areas adjacent to or completely surrounding the commercial structures.

- 124 Neighborhood Business District (NBD). This type denotes small commercial areas within, or adjacent to residential areas. The type may be found in established or newer subdivision areas. NBD structures can range from conventional architecture to unusual geometric shapes. Small parking areas are associated with NBD commercial areas.
- 126 Institutional Land. The type reflects areas devoted to public or quasi-public uses. Examples include schools, churches, hospitals, prisons, etc., and their associated "grounds," green space, landscaping and parking facilities. When located within the CBD, public buildings without "grounds" often cannot be identified on aerial photos and would be classified as commercial (121).

#### Industrial Land

- 138 Industrial Park. The type includes both heavy and light industrial use areas.
- Heavy industrial land contains facilities for the manufacture, storage and assembly of raw or partially processed products such as machinery, metals, chemicals, petroleum, or electrical power. Such industries often have large smokestacks and large storage areas. Warehouses and transportation facilities for bulk products and an open and interrupted street pattern characterize this type.
- Light industrial land contains facilities for the manufacture or assembly of smaller, partially processed products such as electronics, appliances, and other secondary process products. Large smokestacks or raw material storage facilities are never present. Many modern light industries are well landscaped and are indistinguishable from commercial activity on aerial photographs.

#### Transportation Land

- 141 Air Transportation. Includes areas with airports and associated facilities, landing strips, hangars, parking areas and adjacent open areas.
- 142 Rail Transportation. This type includes railyards, terminal freight and storage facilities as well as stations for passengers. The type may include liquid storage facilities such as tank farms.
- 143 Water Transportation. This designation is applied to several water-based areas, including docks, warehouses and related land-based facilities for water transportation and commercial fishing. The type includes, as well, public

marinas and their associated facilities: boat slips, buildings and parking areas.

- 143.1 Private Marina. Boat mooring areas adjacent to residential land are designated as private marinas. Often such areas include a protected slip(s), dredged waterway and, or a permanent docking structure built into the waterway.
- 143.2 Public Boat Landing. This type is applied to boat launching areas. Typically, facilities include only a ramp(s) from which boats may be launched and parking areas.
- 144 Divided Highway. This type includes transportation corridors with median strips between lanes. Typically, such roads are four or more lanes wide. Local streets are not included in this type.
- 145 Communications. Facilities and structures devoted to communications. These include radio/television towers, lighthouses and their grounds, buildings and parking areas.
- 146 Utilities. This type includes facilities for the production and distribution of energy. Such areas can include large buildings, towers, roads/parking facilities and, in the case of coal fired plants, large piles of raw coal.
- 147 Sewage Treatment Plant. Buildings, treatment lagoons, parking areas, access roads and grounds are included in this type.
- 148 Landfill. Landfill sites used to bury garbage define this type. Landfills cover an extensive area and are dominated by large excavated areas, mounds of exposed soil and access roads.

#### Extractive Land Use

- 171 Open Pit. The type represents open pit mining areas for extraction of sand, gravel, stone or rock. The type includes access roads and any structures.
- 172 Underground Mine. Mining of underground resources via shaft extraction. Surface features captured on aerial photos would be limited to small structures and access roads.
- 173 Well. Features associated with wells are limited. Identification of wells using only aerial photos is difficult.
- 179 Other Extractive Uses.

## Agricultural and Natural Land

- 181 Abandoned Field (AF). These are agricultural units reverting to wild land. Woody vegetation and grass are abundant but tree crown cover is less than 30%. If tree crown cover were greater than 30%, the land would be classified as forest.
- 182 Agriculture Active (AG). Tilled or tillable crop land which is or recently has been intensively farmed. The boundaries on the ground usually are sharply defined and well maintained. The land supporting farm buildings is included as part of this type.
- 183 Forest (F). Areas of forest, deciduous, coniferous or mixed, having canopy closure of at least 30%. Areas with less than 30% canopy closure are classified as abandoned field.
- 184 Heath (H). Areas of heath plant community as well as grass, shrubs, and other low vegetation found on poor sandy soils.
- 185 Open Water (W). Areas of open water found in lakes, rivers and large streams. Water depth is greater than three feet during the growing season. The boundary of coastal water is located by drawing a line at the river mouth to connect the edges of the coastline, or man-made features like roads, railroads or bridges crossing rivers or inlets are used to establish such a line.
- 186 Rock Ledge (RL). Rock outcrop areas at the coastline or within the coastal zone. Such outcrops are common in Door County.
- 187 Slump Zone (SL). Land located between upland bluff and beach. Slump zones begin at the bluff line and slope down to the beach.
- 188 Wetland (WT). This type covers the full spectrum of wetlands. These include seasonally flooded flats, shrub swamps, meadows, bogs, shallow and deep marshes, and forested wetlands. Each is described below.  
Seasonally flooded basins or flats occur principally on stream floodplains. The most common plants are grasses and herbaceous species. The soil is waterlogged or covered with water during spring freshets, but well-drained during the growing season.  
Shrub swamps often have waterlogged soil during the growing season, as much as six (6) inches of water may be present. Vegetation types include elder, buttonbush, dogwood and willow. Sedges usually are present in tussocks.

Meadows are vegetated with grasses, rushes and sedges. Soils are waterlogged through most of the growing season. Surface water is present only for a short period during the spring.

Bogs are unique wetland types that support a distinctive plant community, including most of the following: heath shrubs, cranberries, pitcher plants and sedges. Scattered black spruce, tamarack and red maple may be present. A mat of sphagnum moss is the most common feature of bogs.

Shallow marsh is wetter than meadow. The soil is completely waterlogged and often covered with up to six inches of water during the growing season. The predominant vegetation is emergent, including such plants as cattails, bulrushes, burreed, pickerelweed and arrowhead with some grasses and sedges present. The type is common to open water bodies.

Deep marsh has water depth ranging from six inches to three feet. Fairly large open water areas are bordered by, or interspersed with, emergent vegetation like that found in shallow marsh. Floating and submergent plants such as water lilies, duckweed, watershield and pondweeds also are present.

Forested Wetlands. This type represents areas of moist to saturated soil covered by forest canopy. The type is difficult to identify without stereo photography and, or with "leaves-on" photography.

#### Open and Other Land

##### 191 Outdoor-Public Assembly

192 Urban Open Lots. Urban open is undeveloped land lying idle in the midst of urban areas or adjacent to them. This type includes land which has been cleared for urban development of an unknown use.

193 Outdoor Recreation. Outdoor recreation types are either mainly for participation, mainly for spectators, or are environmental in character. Each recreational type includes the recreational complex: access roads, parking facilities, buildings and other related facilities.

Interpretive borders of State and municipal park and recreational lands in terms of this project are determined by previously established property lines found on USGS maps or on local maps of the particular study year in question, not by interpretive judgement. This is the only land use type which uses this method of identification. However, private recreational areas are defined by interpretive judgement.

##### 194 Cemeteries

## Uninterpreted Land

UI Area between the photo edge and extrapolated 1000' shoreland strip. Since no photo coverage is available for this polygon, the area is not interpreted. This simply indicates the size of the lost coverage.

## Shoreline Modification

Development along the lakeshore often means modification at, or near, the shoreline. Land along the lakeshore is exposed to significant erosional forces. Recession of land mass is common. Agricultural and urban land uses destabilize shoreland, in effect accelerating erosion and land recession. To protect real estate and property, many property owners have constructed walls or revetments along their shoreline. Some owners also have built non-flow-through docks at the shoreline to provide mooring and protection for their boats. Groins, large rock structures perpendicular to the shoreline, have been built along Wisconsin's Lake Michigan shoreline.

- 195 Sea Walls (V 195 V). These structures are built parallel to the shoreline and typically are well defined, linear features. Construction materials can include concrete, wood or interlocking sheet steel.
- 196 Revetments (V 196 V). Large rock or slab structures built parallel to the shoreline. Interpretively, revetments are less well defined, and appear wider than do sea walls.
- 197 Groins ( \* [red] ). Groins are large rock structures built perpendicular to the shoreline into the water. Except for their distinct orientation and placement, groins appear similar to revetments.
- 198 Non-Flow-Through Dock ( \* [blue] ). Such docks are permanent structures built into near-shore waters. Typically these docks are straight, their upper surface wide and well defined.

## Structures - Industrial, Commercial and Residential

On the 1992 photos, buildings within the coastal zone are classified by type and location. Using a template of rectangles, for each building, a rectangle is selected that best represents the area of the building's "footprint." The selected rectangle then is positioned so that the leading edge of the building (relative to the shoreline) is located. Buildings for 1978 were counted by type. However, due to photo format differences, comparison of 1978 and 1992 structural counts may be inaccurate.

## THE PHOTOINTERPRETIVE PROCESS

After photo preparation, each photo was interpreted using the classification scheme defined above. Area (land uses), linear (shoreline modification) and point (urban structures, groins, docks) types are represented in this study. Lines and symbols were used to define all types. Area types are represented by perimeter boundary lines and symbols to define and identify the areas. Line types representing modification to natural shoreline were defined using both lines and symbols. All area and line type symbols are recorded in black ink. Point types are defined by symbols and colored ink (see above).

Modifications to the shoreline, such as sea walls or revetments, are delineated by placing (painting) the 'V' symbol at the beginning and end of the modification. The type of modification is represented by placing the appropriate number between the 'V' symbols. For example, 195 positioned between two 'V' symbols means that a sea wall has been built along this section of shoreline. Shoreline classification was conducted before land use so that land use boundary lines placed along the shoreline would not 'hide' shoreline information.

Groins and non-flow-through docks were defined by point symbols (see above). In both cases, the symbol was placed at the point where the structure meets land. As discussed above, for 1992, buildings also were classified using point symbols. The delineation of buildings represents the last API procedure.

### MEASUREMENT OF AREA, LINE AND POINT TYPES LOCATED WITHIN THE COASTAL ZONE

Area Types (Land Use Polygons), Line Types (Shoreline Modification) and Point Types (Groins, Structures)

Area and line measurements were made using the hardware/software facilities of the GIS Lab at the University of Wisconsin-Green Bay. Photo acetate overlays were affixed to large-format digitizers and each land use polygon digitized along the perimeter. Measurements recorded in square inches were converted to acres/hectares. Line measurements (in inches) of shoreline modifications were made using digitizers as well. Linear inch measurements were converted to linear feet/meters for each type of modification.

Point types simply were tallied by count for each type. The area covered by each acetate was broken into civil jurisdiction and PLSS section designations. Measurements (above) were separated by civil and PLSS designations as well, and documented permanently on each acetate overlay.

### TALLY OF DATA

Measurements recorded on each photo acetate were transferred to data sheets. Three (3) levels of data sheets were used: PLSS



Section Data; Civil Jurisdiction Summary Data; and County Summary Data (Appendix).

PLSS Section Data Sheet: One (1) PLSS Section Data sheet was used for each section located on a photo/acetate. Generally, 1-2 PLSS sections are located on a photo, however, up to four (4) sections per photo were recorded. Section level data sheets record photo documentation including photo year, photo number, county and community(ies) covered, and complete PLSS section location. Also recorded were number of residential, commercial, industrial and institutional structures (1992), area of land use by type, linear distance of sea walls and revetments, and the number of groins and non-flow-through docks.

Civil Jurisdiction Summary Data Sheet: This tally sheet summarizes the data for all PLSS section sheets found within each township, village or city. The sheet records photo year, county, name of civil jurisdiction, a complete listing of PLSS sections included in the summary, as well as all land use, shoreline and structure count data discussed above.

County Summary Data Sheet: The County Summary sheet summarizes all data for the towns, villages and cities located within the county. Documented information includes photo year, county name, an alphabetical listing of all civil jurisdictions within the county, and a summary of all land use, shoreline and structure count data reported on Civil Jurisdiction Summary Data sheets.

#### LIMITATIONS AND SOURCES OF ERROR

The U.S. Army Corps of Engineers contracted for aerial photography of the Wisconsin portion of the Lake Michigan shoreline on April 21, 1978 and May 19, 1992. Both sets of photos are 1:6000 scale and panchromatic color, however, the 1978 photos are "leaves-off" while the 1992 photos are "leaves-on." The 1967 photos were flown for Door County Planning on August 28<sup>th</sup> at a scale of 1:7920. The 1967 photos are "leaves-on."

Copies of the original stereo photos (1:6000 and 1:7920 scale) were not available for this study. Instead, enlargements (1:2400 and 1:3168 scale) of the original photos were borrowed from Corps district offices in Green Bay and Waukesha and the Door County Planning office. The enlargements provided photographic coverage only, not stereo coverage. Normally, for a project of this magnitude, photos would have been taken to meet the specific objectives of the study. The enlarged photos used for this project present limitations and introduce error beyond what would be reported with original photos flown specifically for this study. Limitations and errors associated with the photographs used are discussed below. Also presented below is discussion regarding methodological inconsistencies.

The following discussion of Limitations and Sources of Error is presented in an attempt to provide the reader a basic understanding of the issues. Any section of the discussion could

apply to any of the results reported below. The Results sections of this report present findings without any comprehensive attempt to explain anomalies within, or between, the photo study years (1967, 1978 and 1992).

#### Photo Scale and Enlargements

All vertical aerial photographs not ratioed (enlarged or reduced to a common average scale) or rectified (common tilt/tip corrected to a horizontal reference plane) inherently are scale inaccurate. The original photos (1967, 1978 and 1992) were not ratioed or rectified, therefore, their scale varies relative to topographic changes of the coastal zone, tip/tilt of the camera and changing elevation of the camera (aircraft). Enlargements of the original photos simply accentuate the inaccuracies found on the original photos.

Area and linear measurements taken off of the enlarged photos reflect the inaccuracies inherent in those photos. Simple tests of shoreline distances for numerous PLSS sections within each county were conducted to establish linear accuracies of the photos. In addition, areal comparisons were performed on selected portions of several municipalities common to all three study years. USGS topo sheets at 1:24000 scale were used to establish base shoreline distance and area measurements against which photo (1967, 1978 and 1992) shoreline distance and area measurements could be compared.

Summaries of the four (4) shoreline distance and ten (10) area measurement tests were performed (Tables I. and II.). Systematic errors (photoset errors exceeding  $\pm 3.0\%$ ) were found in linear tests of the 1978 and 1992 photos only. The range of error in 1967 was  $+0.37\%$  to  $+1.26\%$ , while the range of error in the 1978 photos was  $+1.34\%$  to  $+3.86\%$ . The 1992 photoset was the only one to possess a negative range. That range of error was  $-3.59\%$  to  $-1.14\%$ .

Unlike the linear shoreline distance tests, systematic errors were found in all areal measurement tests. The range of error in the 1967 photos was  $-8.49\%$  to  $+2.20\%$ , compared with the  $-9.08\%$  to  $+6.04\%$  range in the 1978 photos. The greatest discrepancies were found in the 1992 photos, which varied from the USGS standard from  $-17.7\%$  to  $-2.64\%$ . Without a test of error for each photo used, there is no means to judge the direction or the amount of error relative to the land use and shoreline data of each photo. Yet, given the range of error found for the 1967-1978-1992 photos, it is possible that 1,000 acres (405 ha) of actual coastal zone area could be interpreted as between 915.1 acres (370.6 ha) and 1,022 acres (413.9 ha) in 1967, 909.2 acres (368.2 ha) and 1060.4 acres (429.5 ha) in 1978, and between 823.0 acres (333.3 ha) and 973.6 acres (394.3 ha) in 1992.

## "Leaves-On" Versus "Leaves-Off" Aerial Photography

There are distinct advantages and disadvantages of both "leaves-on" and "leaves-off" aerial photography. However, given the goals of this project, the 1978 "leaves-off" photography offers important advantages over the 1967 and 1992 "leaves-on" photography. Vegetation in leaf can hide the details of built structures, including buildings and shoreline modifications. Roads can be hidden under tree crowns, as well as portions of lots landscaped and managed as residential land. Leaved canopies increase the effect of shadows. Shadows mask ground, understory and structural information leading to inaccurate interpretation. Land uses and/or structures hidden under the canopy of vegetation or masked by shadows can be underestimated in area, length or count. Land use types particularly affected (underestimated) are single family residential and wetland.

## Stereo Versus Photographic Coverage

All three (1967, 1978 and 1992) photo sets were taken to capture stereo (3-D) coverage of the Lake Michigan coastal area. This means that adjacent photos overlap approximately 60%. Stated another way, 60% of the shoreland area located on one photo also is located on an adjacent photo. The shoreland common to adjacent photos is "seen" from two different perspectives which allows stereo viewing (using a stereoscope).

The enlarged photos borrowed from USACE and the Door County Planning Department for this study represent photographic coverage only, or every other photo taken of shoreland. While photo (2-D) coverage at large scales can be used to interpret accurately many land use types (agricultural and most urban land), the lack of stereo viewing makes difficult the identification of wetland types and the exact location of bluff lines. Stereo viewing generally would have increased the interpretive accuracy of most land use, structural and shoreline features.

## Incomplete Photo Coverage

For this study, the coastal zone is defined as a 1000' strip of land adjacent and parallel to the shoreline. Occasionally, photo coverage did not include all shoreland within 1000' of the water. As a result, total land area is underrepresented, the exact land use types not covered are not known. In such cases, a line in blue ink was drawn where the inland border of the 1000' strip would have gone, had there been coverage. This area, defined by the edge of the photograph and the extended 1000' blue line, was designated "UI". This area is not interpreted for land use; however, the acreage of the lost coverage is known.

### Missing Photo Coverage

Occasionally, photo coverage was missing from the USACE and Door County Planning photo libraries. In such cases, as described above, coverage area missing was estimated by reference to photos of the other flight years. However, the exact land use types and shoreline features not represented on photos remain unknown.

### Location of 1000' Coastal Zone Boundary

On each photo set (1967, 1978 and 1992) a boundary line was drawn representing the 1000' coastal zone parallel to the shoreline. This line was located by scribing a landward line parallel to the line defined by the shoreline (where water meets land). The landward extent of the boundary line is a function of shoreline location, which in turn, is dependent on the water elevation of Lake Michigan. USACE (1967, 1978, 1992) reports that in August of 1967 Lake Michigan water elevation was about 578.8 feet (176.5 meters), 578.4 feet (176.3 m) in April of 1978 and about 579.16 feet (176.5 meters) in May, 1992. The 4.8 and (9) inch differences in water elevation, while seemingly insignificant, could have shifted substantially landward the shoreline in extremely low slope beach or mud flat areas. The result of such a shift would be inclusion of inland areas NOT included in the 1967 and 1978 coastal zone.

### Lack of Beach Type in Classification Scheme

The width or extent of beach is dependent on slope of an area and water elevation. Since changes in the area of beach likely would reflect more the differences in 1978 and 1992 water levels (9 inches higher in 1992) than actual losses/gains due to erosion or development, no beach type was included in the study.

The lack of a beach type does affect measurement of area within the 1000' coastal zone. The landward extent of the coastal zone is 1000' from the shoreline. Any beach area lies between the shoreline and the base of the bluff, however area measurements of land use types were made only for those types lying between the base of the bluff and the interior boundary of the coastal zone. In most cases, beach strips represent only about five (5) acres per photo.

### Positional Changes to the Shoreline: Natural vs. Urban Development

As discussed above, the landward extent of the 1000' coastal boundary is dependent on the location of the shoreline. Natural changes to shoreline position include both water elevation and erosion/deposition of soil. Filling of coastal waters to accommodate urban development artificially changes shoreline location. In such cases, not only does the shoreline move

"offshore," the interior coastal zone boundary line shifts toward the water. This "shift" in coastal boundaries skews area measurement. For example, in 1978 assume the coastal zone in an area to be all residential and that by 1992 100 acres of lake water is filled to develop commercial land. A "lakeward" shift in the location of the shoreline will occur due to the land filled for commercial use. However, this "shift" in the shoreline created by the filled commercial site also will result in a shift toward the water of the interior coastal zone boundary. The effect of the latter shift will be that 100 acres of residential land will not be included as part of the 1992 coastal zone. In such a case, the "raw" statistics misleadingly suggest that 100 acres of residential land use were eliminated to make room for 100 acres of commercial use.

## RESULTS

### PENINSULAR DOOR COUNTY

The coastal zone of Door County is comprised of the total acreage of all the interpreted general land use categories for each study year. In 1967, this figure was 18865.9 acres (7640.7 ha). In 1978 and 1992, 18428.8 acres (7463.7 ha) and 17520.5 acres (7095.8 ha), respectively, made up the Door County coastal zone. Using the 1967 figure as a standard for an initial comparison, the error between this coastal zone and that of 1978 was -2.32%. An error of -7.13% was present when comparing the coastal zone of 1992 with 1967. The discrepancy is likely the result of enlarged aerial photos, as discussed on pages 13 through 17.

Due to incomplete photographic coverage of the coastal zone and photos missing from the USACE and Door County Planning Department libraries, some areas of the coastal zone went uninterpreted during certain study years. As a result, estimates were made of these uninterpreted areas for each study year and added onto the interpreted acreage of that year. In cases where the coastal zone was abbreviated by the edge(s) of certain photos, the 1000' strip was simply extended on the acetate to compensate. No interpretive work was performed on these areas; however, the area was calculated. In the case of missing photos, estimates of the missing area(s) of one study year were made by averaging the totals of the other two study years for that same area.

New coastal zone totals were calculated for each of the three study years. New figures were calculated by adding the interpreted and uninterpreted areas of each year. Consequently, the deviations between the coastal zone sizes of each year changed.

The coastal zone in 1967 was calculated to be 19127.3 acres (7746.6 ha). In 1978 and 1992 respectively, the area of the coastal zone was 18480.0 (7484.4 ha) and 17539.7 acres (7103.6 ha). Again, using the 1967 coastal zone as a standard, the 1978

coastal zone was off this standard by -3.38%. The 1992 coastal zone deviated by -8.30%.

These actual differences in the coastal zone were compared with photographic tests of linear and areal accuracy (Tables I and II). Linear accuracy tests were performed on three Door County civil units: the townships of Union, Sevastopol, and Clay Banks. Since the Township of Sevastopol borders both Green Bay and Lake Michigan, it was divided into two units for the purpose of this study: bayshore and lakeshore. Measurement of the entire shoreline of each these civil units was undertaken for each study year. Each study year was compared to the USGS 1:24000 map. Taking all three civil units into account, the 1967 photos exceeded the USGS standard from +0.37% to +1.26% or a difference between 70.8 (28.7 ha) and 241.0 acres (97.6 ha). For 1978, the range was between +1.34% and +3.86% or between +247.6 (100.3 ha) and +713.3 acres (288.9 ha). The 1992 photos erred from -1.14% to -3.59% or between -200.0 (81.0 ha) and -629.7 acres (255.0 ha), respectively. All errors were within the acceptable  $\pm 3.0\%$ .

Table I: TEST OF LINEAR ACCURACY. Final Averages of Photoset Deviations from USGS maps (1:24000). Errors were converted into acres and added to the yearly acreage totals for an adjusted total. Summary of data taken from Union, Sevastopol, and Clay Banks Townships.

Year	Total Acreage	Error Range (by %)	Error Range (in acres) <sup>1</sup>	Adjusted Acreage <sup>2</sup>
1967	19127.3	+0.37 to +1.26	+70.8 to +241.0	18886.3 to 19056.5
1978	18480.0	+1.34 to +3.86	+247.6 to +713.3	17766.7 to 18232.4
1992	17539.7	-3.59 to -1.14	-629.7 to -200.0	17739.7 to 18169.4

1 Indicates the extent of yearly acreage over-and-above or under-and-below the USGS standard.

2 The Error Range (in acres) column was added to the yearly acreage totals taking the reverse of the sign to compensate for photographic enlargement errors.

Areal Accuracy tests were performed on various portions of Egg Harbor, Gibraltar, Bailey's Harbor, and Jacksonport townships, the Village of Ephraim, and the Village of Sister Bay.

Taking all tests into account, the range of error for the 1967 photos was between -8.49% and +2.20% or -1623.9 acres (657.7 ha) to +420.8 acres (170.4 ha). The 1978 photos deviated from the USGS standard by -9.08% and +6.04% or -1678.0 acres (679.6 ha) to +116.2 acres (47.1 ha). The 1992 photo error was between -17.7% and -2.64% or -3104.5 acres (1257.3 ha) and -463.0 acres (187.5 ha).

#### COUNTY AND INDIVIDUAL COASTAL COMMUNITY FINDINGS

Statistical summaries of Door County and all communities included in this study are located in the Appendix.<sup>1</sup> Land use types by area, structural counts by type (1992), shoreline modification types by length, and a count of shoreline structures by type are presented on summary data sheets. Data were collected at the PLSS section level. Due to their overwhelming numbers, section level sheets are not included in this study.

Table II: TEST OF AREAL ACCURACY. Final Averages of Photoset Deviations from USGS maps (1:24000). Deviations were converted into acres and added to the yearly acreage totals for an adjusted total.

Year	Total Acreage	Error Range (by %)	Error Range (in acres) <sup>1</sup>	Adjusted Acreage <sup>2</sup>
1967	19127.3	-8.49 to +2.20	-1623.9 to +420.8	18706.5 to 20751.2
1978	18480.0	-9.08 to +6.04	-1678.0 to +1116.2	17363.8 to 20158.0
1992	17539.7	-17.70 to -2.64	-3104.5 to -463.0	18002.7 to 20644.2

1 Indicates the extent of yearly acreage over-and-above or under-and-below the USGS standard.

2 The Error Range (in acres) column was added to the yearly acreage totals taking the reverse of the sign to compensate for photographic enlargement errors.

<sup>1</sup>Area figures used in the Results discussion reflect totals (not rounded) reported on the original tally sheets. Figures presented on the tally sheets found in the Appendix of this report have been rounded to the nearest whole number.

Door County land use and shoreline modification data will be explicated below. Each general use category will be considered in this description and is summarized in Table III. Percentages relayed are based on the total of interpreted and uninterpreted land of the year in question. In addition, a summary of the data found within each of the sixteen (16) coastal zone communities of Door County will be provided.

## COUNTY LAND USE INVENTORY

### Residential Land

Residential land grew substantially between 1967 and 1992. In 1967, 8.0% (1534.6 acres [621.5 ha]) of the coastal zone of Door County was classified as residential land. In 1978, this figure rose to 15.0% (2762.8 acres [1118.9 ha]). By 1992, residential land use accounted for 18.5% (3247.2 acres [1315.1 ha]) of Door County's coastal zone. The 10.5% gain between 1967 and 1992 is likely due to the appeal the waterfront and nearshore areas have among seasonal and permanent homeowners.

By far, the majority of this increase can be attributed to the single family/duplex construction. In 1992, of the 6935 structures recorded in this category, 4483 were single family/duplex, 208 were mobile home units, 128 were multi-family/low rise, and the remaining 2116 were classified as garages, sheds, or barns.

### Commercial and Industrial Land

Over the three study years, commercial land increased, while industrial land was phased-out of the coastal zone of Door County. In 1967, 0.84% (160.6 acres [65.1 ha]) of the coastal zone was devoted to commercial uses. By 1978, there was a 0.45% (77.2 acres [31.3 ha]) increase. In 1992, 1.8% (311.1 acres [126.0 ha]) of the coastal zone was commercial. Six hundred sixty-three (663) commercial structures were identified. Of these, 368 belonged to the central business district, 278 were classified into the neighborhood business district type, and 17 were classified as institutional.

Industrial land in the coastal zone was negligible. In 1967, only 15.3 acres (6.2 ha) was devoted to industrial uses. By 1978, only 6.1 acres (2.5 ha) remained. By 1992, no industrial land was recorded in Door County's coastal zone. As a result, no structures were identified in this general use category. It should be noted that due to the method of defining coastal zone area at the junction of streams and rivers, much of Sturgeon Bay's industrial land adjacent to the canal was not included.



## **Transportation Land**

Land devoted to transportation also increased between 1967 and 1992. Only 0.28% (54.7 acres [22.1 ha]) of the coastal zone was given to transportation land use in 1967. By 1978 and 1992, this figure had risen to 0.42% (78.3 acres [31.7 ha]) and 0.68% (118.4 acres [48.0 ha]) of the coastal zone, respectively.

Most transportation land use is attributed to the development of public boat landings throughout the county. The area covered by private marinas decreased from 42.3 acres (17.1 ha) in 1967 to 29.5 acres (11.9 ha) in 1978; while public boat landing areas increased from 11.1 acres (4.5 ha) to 38.4 acres (15.6 ha) over the same period. By 1992, private marina land rose to 43.4 acres (17.6 ha), while public boat landing facilities increased to cover 60.8 acres (24.6 ha) of Door County's coastal zone. Likewise, of the 47 structures identified on transportation land, 22 were associated with the public boat landing type, 20 with the private marina type, and the remaining five (5) structures were associated with the communications land use type.

## **Extractive Land**

For the most part, extractive land remained stable between 1967 and 1992. Extractive land totals were recorded as just under the 50 acre (20.3 ha) mark for each of the three study years.

In 1967, all 47.8 acres (19.4 ha) were identified as belonging to the open pit type. By 1978, only 8.0 acres (3.2 ha) of open pit were recorded. The 41.7 acre (16.9 ha) remainder was identified as other extractive. By 1992, the acreage for these two types was nearly equal: 23.8 acres (9.6 ha) for open pit and 25.2 acres (10.2 ha) for other extractive.

## **Agricultural and Natural Land.**

This general land use category lost the most area of any other general use category. In 1967, 75.6% of Door County's coastal zone fell into this category. By 1978 and 1992, 66.9% and 62.9% of the coastal zone fell into this category, respectively. Strictly agricultural land lost 237.3 acres (96.1 ha) between 1967 and 1978. By 1992, this type had lost 396.0 acres (160.4 ha) more to account for only 7.4% of the coastal zone, compared with 10.1% in 1967.

Natural lands declined from being 65.4% of the coastal zone in 1967 to 57.7% in 1978. Between 1978 and 1992, the conversion slowed. In 1992, 55.5% of the coastal zone was classified as natural. Forests and wetlands underwent the largest declines. Forested areas lost 1101.3 acres (446.0 ha) between 1967 and 1992; while wetland areas lost some 820.1 acres (332.1 ha) over the same period. In addition, land classified as abandoned fields declined 796.8 acres (322.7 ha) between 1967 and 1992,

probably due to forest succession as well as conversion to urban uses.

Losses in agricultural and natural areas could have occurred for a variety of reasons. "Leaves-on" photography could have inhibited accurate wetland identification. The establishment of Whitefish Dunes after 1967 has placed a large amount of natural lands (180.6 acres [73.1 ha]) into the outdoor recreation land use type. In addition, photographic enlargement errors, especially in the 1992 photos, may make it seem that natural areas are losing more acreage than they actually are. Nevertheless, when this general use category is taken as a percentage of the whole coastal zone for that year and compared to other general use categories, a conversion of natural and agricultural land uses to residential, commercial and infrastructural uses is indeed taking place.

#### Open/Other Land

This category increased from being just 8.6% in 1967 to 15.8% of the coastal zone in 1978. By 1992, open/other land accounted for 15.7% of the land in the coastal zone. In 1992, 49 structures were identified in this general use category. Seven (7) belonged to the urban open lots type, while the remaining 42 were identified within the outdoor recreation type.

Table III: DOOR COUNTY COASTAL ZONE LAND USE (1967-1992) BY GENERAL USE CATEGORY AS A PERCENTAGE OF THE TOTAL COASTAL ZONE.

GU Category	1967	1978	1992
Residential	8.0%	15.0%	18.5%
Commercial	0.8%	1.3%	1.8%
Industrial	0.08%	0.03%	-
Transport.	0.3%	0.4%	0.7%
Extractive	0.2%	0.3%	0.3%
Agri/Nat.	75.6%	66.9%	62.9%
Open/Other	13.6%	15.8%	15.7%
Total <sup>1</sup>	98.6%	99.73%	99.9%

<sup>1</sup> Total of all interpreted areas only. Adding in uninterpreted areas will raise these figures to 100%.

Outdoor recreation increased much more than any of the other land use types in this category. In 1967, there were 2568.1 acres (1040.1 ha) of recreational land in Door County's coastal zone, accounting for nearly 99% of this general use category. Due to the creation of Whitefish Dunes, 180.6 acres (73.1 ha) of land previously classified into the agricultural and natural use category were placed into the outdoor recreation type by 1978. By 1992, possibly due to photographic enlargement error, 80.5 acres (32.6 ha) were lost from the 1978 figure.

#### **Shoreline Modifications**

Ostensibly, sea walls and revetments are constructed to prevent shoreline erosion damage as well as damage to urban residential, commercial, industrial, and recreational structures. Shoreline modification increased substantially over the three study years. A summary of shoreline modification is provided in Table IV. In 1967, 61692.4 linear feet (18808.7 m) of shoreline was modified by either a sea wall or a revetment. Between 1967 and 1978, there was a 127.9% (78912.8 feet [24958.8 m]) increase in construction. By 1992, this figure had risen to 160190.0 linear feet (48838.4 m), a 13.9% (19584.8 feet [5971.0 m]) increase from 1978. In other words, 30.3 miles (48.5 km) of Door County shoreline possessed a sea wall or revetment in 1992, compared with only 11.7 miles (18.7 km) in 1967.

Sea walls accounted for 37546.6 linear feet (11447.1 m) of Door County shoreline in 1967. By 1978, this figure grew to 75226.4 linear feet (22934.9 m) of shoreline. In 1992, 80664.2 linear feet (24592.7 m) of shoreline was modified to sea wall.

Revetments were present on 24145.8 linear feet (7361.5 m) of Door County shoreline in 1967. In 1978 and 1992, revetment construction increased to 65378.8 linear feet (19932.6 m) and 79525.8 linear feet (24245.7 m), respectively.

The number of protective groins decreased, while the number of non-flow-through docks increased between 1967 and 1992. In 1967, 41 groins were recorded. By 1978, this number decreased to 27, but increased to 29 by 1992. Non-flow-through docks decreased from 68 to 64 from 1967 to 1978. However, by 1992, 152 non-flow-through docks were recorded in peninsular Door County.

#### **COUNTY URBAN VS. NATURAL LAND USES**

The natural areas of Door County coastal zone are being converted into urban uses. In order to gain a clear picture of the phenomenon, certain general land use categories and types have been grouped together. All general land use categories and land use types have been simplified into two divisions (Table V): Urban and Natural. Agriculture will be examined as an important subdivision of urban developed lands.

The residential, commercial, industrial, transportation, extractive, and open land/other general land use categories have been grouped into the Urban division. Residential and

agricultural lands make up the bulk of urbanized areas (Table VI). The active agriculture type has been added to urban development, because of the substantial land modification required to grow crops. The agriculture type also will be examined by itself. Lands associated with outdoor recreation have been left out of this division, due to the large amounts of natural areas found within them.

Table IV: SHORELINE MODIFICATION OF THE DOOR COUNTY COASTAL ZONE (1967-1992) BY TYPE. Sea walls and revetments are indicate in terms of linear feet. Groins and Non-flow-through docks are indicated in terms of number recorded.

Structure Type	1967	1978	1992
Sea Wall	37,546.6 feet	75,226.4 feet	80,664.2 feet
Revetment	24,145.8 feet	65,378.8 feet	79,525.8 feet
Groin (#)	41	27	29
NFTD <sup>1</sup> (#)	68	64	152

1 Non-flow-through dock

The Natural Lands division consists of the agriculture and natural general land use category minus active agriculture. Essentially, every land use type that, by nature, is not modified by humans has been placed here. Outdoor recreation land also has been classified into this division. Admittedly, a small part of this type has been converted to sports facilities, golf courses and mowed grass; however, the greater majority of Door County's outdoor recreational lands consists of natural lands.

In 1967, 78.9% (15085.8 acres [6109.7 ha]) of Door County coastal zone was classified as natural land, whereas, 19.8% (3780.1 acres [1530.9 ha]) was classified as developed urban land. Of this urban land, 51.3% (1938.6 acres [785.1 ha]) was active agriculture and 40.5% (1534.6 acres [621.5 ha]) was residential. Approximately, 1.4% (261.4 acres [105.9 ha]) of the coastal zone was uninterpreted.

By 1978, natural lands represented 72.6% (13418.7 acres [5434.6 ha]) of the coastal zone. Developed urban lands accounted for 27.1% (5010.1 acres [2029.1 ha]) of the coastal zone. Agriculture declined to being only 34.0% (1701.3 acres [689.0 ha]) of developed lands. Residential land made up 55.1% of urban areas. About 0.3% of the coastal zone was uninterpreted.

In 1992, the coastal consisted of 70.7% (12399.8 acres [5021.9 ha]) natural lands and 29.2%(5120.7 [2073.9 ha]) developed urban. Agricultural and residential lands made up 25.5% and 63.4% of urban land use, respectively. Approximately, 0.1% (19.2 acres [7.8 ha]) of the coastal zone was uninterpreted in 1992.

**CIVIL JURISDICTION LAND USE INVENTORIES**

**Township of Union**

In 1967, a total of 818.9 acres (331.6 ha) made up the coastal zone of the Township of Union. In 1978 and 1992, the coastal zone comprised 767.3 acres (301.6 ha) and 760.4 acres (307.9 ha), respectively. The Township of Union was tested for photo coverage linear accuracy (Table VII).

Using USGS maps at 1:24000, measurements taken from the 1967 photos fell within +0.37% of the USGS basis. The 1978 and 1992 photos deviated by +1.57% and -1.14%, respectively.

Residential land accounted for only 110.8 acres (44.9 ha) in 1967, increasing to 148.4 acres (60.1 ha) in 1978 and 162.6 acres (65.9 ha) in 1992. In 1992, 574 residential structures were located in the coastal zone. Of these, 267 were single family/duplex.

Table V. COMPARISON OF URBAN VS. NATURAL LAND USE BY PERCENTAGE (1967-1992).

Land Use Division	1967	1978	1992	Change 1967-78	Change 1978-92	Change 1967-92
Urban	19.8%	27.1%	29.2%	+7.3%	+2.1%	+9.4%
Natural	78.9%	72.6%	70.7%	-6.3%	-1.9%	-8.2%
Uninterp.	1.3%	0.3%	0.1%	-	-	-
Total	100.0%	100.0%	100.0%	-	-	-

In 1992, one (1) commercial structure was found on 0.7 acres (0.3 ha) of the coastal zone. No commercial land was recorded in this municipality before 1992. Agricultural and natural areas decreased from 695.5 (281.6) acres in 1967 to 607.1 acres (245.8 ha) in 1978 and to 589.2 acres (238.6 ha) in 1992.

Agricultural land increased slightly from 230.6 acres (93.4 ha) in 1967 to 246.2 acres (99.7 ha) in 1978, but declined to 176.0 acres (71.3 ha) in 1992. Natural areas declined from 464.9

acres (188.3 ha) in 1967 to 360.9 acres (146.2 ha) in 1978, but increased to 413.2 acres (167.3 ha) in 1992.

Shoreline modifications increased 513.7% (9337.4 feet [2846.8 m]) from 1967 to 1978 and 43.4% (4843.8 feet [1476.7 m]) from 1978 to 1992. Sea walls increased substantially from 1481.7 feet (451.7 m) in 1967 to 7745.0 feet (2361.3 m) in 1978 and to 9446.8 feet (2880.1 m) in 1992. Revetment construction also increased significantly from 335.9 feet (102.4 m) in 1967 to 3410.0 feet (1039.6 m) in 1978 then to 6552 feet (1997.6 m) in 1992.

Table VI. COMPARISON OF RESIDENTIAL AND AGRICULTURAL LAND USES AS A PERCENTAGE OF COASTAL URBAN AREAS (1967-1992).

Urban Land Use	1967	1978	1992	Change 1967-78	Change 1978-92	Change 1967-92
Residential	40.6%	55.1%	63.4%	+14.5%	+8.3%	+22.8%
Agriculture	51.3%	34.0%	25.5%	-17.3%	-8.5%	-25.8%
Other Urban	8.1%	10.9%	11.1%	+2.8%	+0.2%	+3.0%
Total	100.0%	100.0%	100.0%	-	-	-

#### Township of Gardner

The total acreage of the coastal zone in the Township of Gardner in 1967, 1978, and 1992 was 1891.2 acres (766.1 ha), 1873.7 acres (758.8 ha), and 1761.9 acres (713.9 ha), respectively.

Residential land accounted for 234.7 acres (95.1 ha) in 1967, 348.7 acres (141.2 ha) in 1978, and 379.6 acres (153.7 ha) in 1992. Of the 1014 residential structures found in 1992, 522 were single family/duplex; 72 were mobile homes; and the remaining 397 structures consisted of garages, sheds, and barns.

There was no commercial land use recorded in 1967; however, 5.7 acres (2.3 ha) were recorded in 1978. In 1992, only 3.0 acres (1.2 ha) were devoted to commercial use. Four (4) commercial structures were observed in 1992. There was a downward trend in the amount of coastal zone devoted to agricultural and natural uses.

Agricultural and natural land declined from 1649.8 acres (668.2 ha) in 1967 to 1492.7 acres (604.5 ha) in 1978 and to 1349.6 acres (546.6 ha) in 1992. Agricultural uses increased slightly from 776.3 acres (314.4 ha) in 1967 to 799.4 acres (323.8 ha) in 1978. In 1992, however, 64.6 acres (26.2 ha) were lost to other uses and 734.8 acres (297.6 ha) were devoted to intensive agriculture. Natural land declined from 873.5 acres

(353.8 ha) to 693.3 acres (280.8 ha) to 614.8 acres (249.0 ha) in 1967, 1978, and 1992, respectively.

There was a dramatic increase in the amount of shoreline modification. There were 9361.6 feet (2854.1 m) of shoreline modification in 1967. This increased 263.1% (24629.6 feet [7509.0 m]) by 1978, declining by 9.4% (-3206.8 feet [-977.7 m]) by 1992. Sea walls increased from 5833.9 feet (1778.6 m) in 1967 to 11633.4 feet (3546.8 m) in 1978, and increased again to 14145.2 feet (4312.6 m) in 1992.

Revetments increased 263% from 1967 (3527.7 feet [1075.5 m]) to 1978 (22357.8 feet [6816.4 m]). There was also a substantial decline in revetment construction by 1992. Only 16639.2 feet (5072.9 m) remained. This figure is likely the result of leaves and shadows concealing parts of the construction rather than actual losses.

Three (3) groins and two (2) non-flow-through docks were recorded in 1967. No groins or non-flow-through docks were found in 1978, while six (6) groins were observed in 1992.

#### **Township of Nasewaupee**

The coastal zone of the Township of Nasewaupee consisted of 1441.0 acres (620.6 ha) in 1967, 1332.4 acres (539.5 ha) in 1978, and 1286.7 acres (521.0 ha) in 1992.

Residential land comprised 198.2 acres (80.3 ha) in 1967. The amount of residential land increased to 243.6 acres (98.6 ha) in 1978 and 312.1 acres (126.4 ha) in 1992. In 1992, 476 structures of the 781 total residential structures were single family/duplex.

Commercial land remained relatively stable between the three study years. In 1967, 7.6 acres (3.0 ha) were devoted to commercial uses in 1967, while 5.7 acres (2.3 ha) and 6.7 acres (2.7 ha) were recorded as commercial in 1978 and 1992, respectively. Of the eighteen (18) structures indicated, one (1) fell into the institutional class. The other seventeen (17) were various neighborhood business district structures.

Agricultural and natural land decreased from 894.8 acres (362.3 ha) to 762.5 acres (308.8 ha) between 1967 and 1978. Land use in this category decreased to 665.4 acres (269.4 ha) by 1992. Agricultural land lost minimal land to other uses; however, natural land lost over 216.9 acres (87.8 ha) between 1967 and 1992.

Open or other land, minus recreational land, increased from 3.9 acres (1.6 ha) in 1967 to 33.1 acres (13.4 ha) in 1978. Nevertheless, land in this category declined after 1978 to 6.9 acres (2.8 ha) by 1992.

Recreational land experienced a decline from 334.8 acres (135.6 ha) in 1967 to 281.6 acres (114.0 ha) in 1978. An increase in this land use was recorded by 1992 where the figure stood at 292.8 acres (118.9 ha).

Shoreline modification grew 167.0% between 1967 (8308.1 feet [2532.9 m]) and 1978 (22184.8 feet [6763.7 m]), but underwent a

modest (2.2%) decline between 1978 and 1992 (21707.4 feet [6618.1 m]). Sea walls increased sharply from 3825.5 feet (1166.3 m) in 1967 to 9766.4 feet (2977.6 m) in 1978, and then, to 10219.8 feet (3115.8 m) in 1992. Revetments also increased between 1967 (4482.6 feet [1366.6 m]) and 1978 (12418.4 feet [3786.1 m]); however, the amount of shoreline revetment fell to 11487.6 feet (3502.3 m) by 1992.

The use of groins and non-flow-through docks declined between 1967 and 1992 in the Township of Nasewaupee. Three (3) groins existed in both 1967 and 1978, but only one (1) remained in 1992. Likewise, from an initial figure of twelve (12) non-flow-through docks in 1967, only one remained in both 1978 and 1992.

#### **Township of Sevastopol (Bayshore)**

The coastal zone of the Township of Sevastopol (Bayshore) was made up of 939.1 acres (380.2 ha), 861.4 acres (348.8 ha), and 750.3 acres (303.9 ha) in 1967, 1978, and 1992, respectively. This township was tested for linear accuracy (Table VII.). From the USGS basis, the 1967 photos fell within +1.12%, the 1978 photos fell within +3.86%, and the 1992 photos fell within -3.05%.

Residential land increased in this township as well. Residential land accounted for 118.6 acres (48.0 ha) in 1967, 241.0 acres (97.6 ha) in 1978, and 279.0 acres (113.0 ha) in 1992. Of the 448 structures recorded in this general use category, 292 were single family/duplex.

In 1967, 12.6 acres (5.1 ha) of commercial land were recorded in the coastal zone. This figure increased slightly to 14.7 acres (6.0 ha) in 1978, but declined to only 2.4 acres (1.0 ha) in 1992. Only two (2) structures belonging to the neighborhood business district were recorded in 1992.

Extractive land underwent little change between the three study years. In 1967, 47.0 acres (19.0 ha) were devoted to extractive uses. This decreased to 40.0 acres (16.2 ha) in 1978, but increased slightly to 40.7 acres (16.5 ha) in 1992. Similarly, open land minus recreational land use went from a 1967 figure of 10.4 acres (4.2 ha) to 17.7 acres (7.2 ha) in 1978 and 14.9 acres (6.0 ha) in 1992.

The agricultural and natural general use category declined over the three study years. In 1967, this category accounted for 740.5 acres (299.9 ha) of this township's total coastal zone. In 1978, agricultural and natural land use dropped to 529.1 acres (214.2 ha), and to 405.7 acres (164.3 ha) in 1992. Agricultural uses only declined sharply from 223.9 acres (90.7 ha) in 1967 to only 72.4 acres (29.3 ha) and 55.8 acres (22.6 ha) in 1978 and 1992, respectively. The decline in natural land was more gradual. From a 1967 tally of 516.6 acres (209.2 ha), natural lands declined to 456.7 acres (185.0 ha) and 349.9 acres (141.7 ha) in 1978 and 1992, respectively.



As a whole, shoreline modification construction grew 119.2% (4875.5 feet [1486.4 m]) from 1967 through 1978 and 17.8% (1604.0 feet [489.0 m]) between 1978 and 1992. Sea walls increased from 2028.3 feet (618.4 m) in 1967 to 3909.6 feet (1192.0 m) in 1978. Sea walls declined to 3122.0 feet (951.8 m) by 1992. Revetments construction grew from 2060.5 feet (628.2 m) in 1967 to 5054.6 feet (1541.0 m) and 7446.2 feet (2270.2 m) of Sevastopol's bay shoreline in 1978 and 1992, respectively.

There was a decrease in the number of groins in this township from seven (7) in 1967 to five (5) in 1978; however, seven (7) groins were again recorded in 1992. Ten (10) non-flow-through docks were interpreted in 1967, none in 1978, and six (6) in 1992.

#### **Township of Egg Harbor**

In 1967, a total of 948.6 acres (384.3 ha) made up the coastal zone of Egg Harbor Township. In 1978 and 1992 respectively, 968.9 acres (392.4 ha) and 931.2 acres (377.0 ha) were located within the coastal zone. The Township of Egg Harbor was tested for areal accuracy using USGS maps at 1:24000 scale (Table VIII). Two tests were performed. The 1967 photos came within -8.49% of the USGS basis. The 1978 photos came within -6.49% of the USGS basis. The 1992 photos were unavailable at the time of the test.

There was a notable increase in residential development. Residential land covered 67.9 acres (27.5 ha), 162.5 acres (65.8 ha), and 199.2 acres (80.7 ha) of the total coastal zone in 1967, 1978, and 1992, respectively. Single family/duplex structures accounted for 221 of the 342 residential structures found in Egg Harbor Township.

Commercial land use was figured at seven (7) acres (2.8 ha) in 1967, increased to 40.4 acres (16.4 ha) in 1978, and decreased to 12.7 acres (5.1 ha) in 1992. The eighteen structures interpreted in the commercial category belong to the neighborhood business district.

Again, agricultural and natural land uses declined. In 1967, 856.8 acres (347.0 ha) were classified as agricultural and natural land. In 1978 and 1992 respectively, this category accounted for 702.1 acres (284.2 ha) and 692.7 acres (280.5 ha) of the total coastal zone. The active agriculture class underwent little change. From 93.1 acres (37.7 ha) in 1967, agricultural land dropped to 76.9 acres (31.1 ha) in 1978 and increased to 89.5 acres (36.2 ha) by 1992. On the other hand, natural lands declined over the three study years. In 1967, this class accounted for 763.7 acres (309.3 ha). By 1978 and 1992, natural lands declined to 625.2 acres (253.2 ha) and 603.2 acres (244.3 ha), respectively.

Recreational land increased from a 1967 figure of 16.1 acres (6.5 ha) to 54.5 acres (22.1 ha) in 1978. Land devoted to recreational uses declined to 21.6 acres (8.7 ha) in 1992.

Shoreline modification increased 67.6% (1893.0 feet [577.1 m]) from 1967 to 1978, but decreased 67.2% (3152.4 feet [961.1 m]) between 1978 and 1992. Sea walls increased dramatically from 1548.4 feet (472.1 m) in 1967 to 4188.6 feet (1277.0 m) in 1978; however, only 686.8 feet (209.4 m) remained in 1992. Revetments decreased from 1251.4 feet (381.5 m) in 1967 to 504.2 feet (153.7 m) in 1978, yet increased to 853.6 feet (260.2 m) in 1992. The likely explanation for these results are the masking characteristics of shadows and leaves associated with "leaves-on" photos.

The number of groins declined from eight (8) in 1967 to one (1) in both 1978 and 1992. There were three (3) non-flow-through docks in 1967, none were recorded in 1978, and five (5) were identified in 1992.

### **Village of Egg Harbor**

Coastal zone area within the village was measured at 588.8 acres (238.4 ha) in 1967, 608.5 acres (246.4 ha) in 1978, and 544.6 acres (220.8 ha) in 1992. The Village of Egg Harbor was tested for area accuracy using USGS maps at 1:24000 scale (Table VIII). Two tests were performed. The 1967 photos came within +0.8% of the USGS basis. The 1978 photos came within +2.87% of the USGS figure. The 1992 photos were unavailable at the time of the test.

An increase in residential development also occurred in the Village of Egg Harbor. Residential land in 1967 covered 82.3 acres (33.3 ha). In 1978 and 1992, residential land increased to 155.3 acres (62.9 ha) and 182.5 acres (74.0 ha), respectively. Single family/duplex structures numbered 206 out of a possible 291 total structures identified in this land use category in 1992.

Commercial land also increased. In 1967, 16.4 acres (6.6 ha) accounted for commercial land use. In 1978 and 1992, 35.5 acres (14.3 ha) and 43.5 acres (17.6 ha) were devoted to commercial use, respectively. Of the 68 structures identified, 51 were in the central business district and the remaining 17 fell into the neighborhood business district category.

Agricultural and natural lands declined substantially in this municipality as well. In 1967, 449.8 acres (182.1 ha) were classified into this general use category. By 1978 and 1992, there were 370.6 acres (150.1 ha) and 235.9 acres (95.6 ha), respectively. Land classified as strictly agriculture accounted for 14.7 acres (6.0 ha) in 1967, 37.0 acres (15.0 ha) in 1978, and 5.0 acres (2.0 ha) in 1992. All other natural lands declined from 435.1 acres (176.2 ha) in 1967 to 333.6 acres (135.1 ha) and 230.9 acres (93.5 ha) in 1978 and 1992, respectively.

Recreational land decreased from 30.5 acres (12.4 ha) in 1967 to 26.8 acres (10.9 ha) in 1978. By 1992, recreational land use had more than doubled to 64.6 acres (26.2 ha).

Shoreline modification increased 42.8% (3921.7 feet [1588.3 m]) between 1967 and 1978, but decreased 2.4% (-314.2 feet [95.7

m]) between 1978 and 1992. Sea walls increased from 6048.2 feet (1844.0 m) of total shoreline in 1967 to 8923.6 feet (2720.6 m) in 1978. Between 1978 and 1992, sea wall decreased to 8522.2 feet (2598.2 m). Revetments increased from 3111.9 feet (948.8 m) in 1967 to 4158.2 feet (1267.7 m) in 1978 and 4245.4 feet (1294.3 m) in 1992.

There were six (6) groins in 1967. None were in place in 1978, while three (3) were identified in 1992. Eleven (11) non-flow-through docks were present in 1967, four (4) in 1978, and twelve (12) in 1992.

### **Township of Gibraltar**

In 1967, 1386.5 acres (561.5 ha) comprised the coastal zone of the Township of Gibraltar. In 1978 and 1992, 1341.4 acres (543.2 ha) and 1268.4 acres (513.8 ha) made up this area, respectively. A single test for area accuracy was performed for the three study years (Table VIII). The 1967 photos were off the USGS basis by +2.16%; the 1978 photos were off by +5.88%. In 1992, the photos came within -2.64% of USGS map measurements.

In 1967, 60.4 acres (24.5 ha) of residential land were recorded in the coastal zone. In 1978 and 1992, residential land increased to 107.9 acres (43.7 ha) and 141.6 acres (57.3 ha), respectively. Of the 161 structures contained in this land use type, 123 were single family/duplex units, 12 were multi-family/low rise, and the remaining 26 were classified as garages or sheds.

Commercial land in 1967 was recorded at 14.2 acres (5.8 ha). It decreased to 5.8 acres (2.3 ha) in 1978 and increased again to 29.0 acres (11.8 ha) in 1992. Of the 114 structures in this land use type, 109 were classified as structures of the central business district; while the remaining five (5) structures were part of the neighborhood business district.

Agricultural and natural land declined from 498.2 acres (201.8 ha) in 1967 to 451.8 acres (183.0 ha) in 1978. In 1992, 360.2 acres (145.9 ha) of the coastal zone were classified as agricultural and natural land. Ten (10) acres (4 ha) were strictly agricultural in 1967. This figure decreased slightly to nine (9) acres (3.6 ha) in both 1978 and 1992. Strictly natural land decreased from 488.1 acres (197.7 ha) in 1967, to 442.9 acres (179.4 ha) in 1978 and to 351.2 acres (142.2 ha) in 1992.

Recreational land also decreased over the three study years. In 1967, 803.1 acres (325.6 ha) were classified as recreational land. In 1978 and 1992, this figure was 775.8 acres (314.2 ha) and 728.8 acres (295.2 ha), respectively.

Shoreline modification decreased 22.3% (932.4 feet [284.3 m]) between 1967 and 1978, and increased 91.0% (2950.2 feet [899.5 m]) between 1978 and 1992. Sea walls increased from 1734.6 feet (528.8 m) in 1967 to 2418.8 feet (737.4 m) and 2984.6 feet (909.9 m) in 1978 and 1992, respectively. Revetments decreased from 2440.0 feet (743.9 m) in 1967 to 823.4 feet (251.0

m) in 1978. In 1992, revetment totals soared to 3207.8 feet (978.0 m).

No groins or non-flow-through docks were present in 1967. In 1978 and 1992, the Township of Gibraltar possessed three (3) groins. There were six (6) non-flow-through docks in 1978 and eleven (11) in 1992.

### **Village of Ephraim**

The coastal zone of the Village of Ephraim was 554.8 acres (224.4 ha) in 1967, 559.4 acres (226.7 ha) in 1978, and 513.1 acres (207.9 ha) in 1992. The Village of Ephraim was tested for area accuracy (Table VIII). The 1967 photos fell between -2.61% and +2.09% of the USGS foundation. The 1978 photos fell between +2.85% and +4.04%, and the 1992 photos fell between -11.64% and -14.93% of the USGS basis.

Residential land increased from 96.4 acres (39.0 ha) in 1967 to 158.2 acres (64.1 ha) and 189.1 acres (76.6 ha) in 1978 and 1992, respectively. Of the 302 structures in the residential general land use category: twenty (20) were multi-family/low rise, 213 were single family/duplex, and the remaining 69 structures were garages or sheds.

Commercial land decreased from 33.5 acres (13.5 ha) in 1967 to 14.3 acres (5.8 ha) in 1978. Between 1978 and 1992, commercial land increased to 38.0 acres (15.4 ha). In 1992, there were 85 central business district structures and three (3) institutional structures.

Agricultural and natural land decreased substantially over the three study years. In 1967, this figure stood at 378.5 acres (153.2 ha), 68.2% of Ephraim's coastal zone. In 1978 and 1992, agricultural and natural land use decreased to 52.0% (290.7 acres [117.8 ha]) and 38.8% (199.1 acres [80.8 ha]) of the coastal zone, respectively. Agricultural land alone decreased from 129.0 acres (52.2 ha) in 1967 to 21.4 acres (8.7 ha) in 1978 and no acres in 1992. Natural areas underwent a slight increase from 249.5 acres (101.0 ha) in 1967 to 269.3 acres (109.1 ha) in 1978. Nevertheless, total area of natural lands fell to 199.1 acres (80.6 ha) in 1992.

Recreational land increased from 41.0 acres (16.6 ha) in 1967 to 88.5 acres (35.8 ha) in 1978. Recreational lands experienced a slight decrease from 1978 to 1992 where the figure was 81.5 acres (33.0 ha).

Shoreline modifications increased by 160.0% (5864.9 feet [1788.1 m]) between 1967 and 1978. Between 1978 and 1992, an 8.7% (831.0 feet [253.4 m]) increase was experienced. Sea walls increased from 2012.4 feet (613.5 m) to 5473.2 feet (1668.7 m) in 1978. In 1992 5575.4 feet (1699.8 m) of sea wall were recorded. Revetments also increased over the three study years, from a total of 1653.9 feet (504.2 m) in 1967 to 4058.0 feet (1237.2 m) in 1978 and 4786.8 feet (1459.4 m) in 1992.

There was a decrease in the number of groins from four (4) in 1967 to only one (1) in 1978; however in 1992, two (2) groins

were documented in the Village of Ephraim. Four (4) non-flow-through docks were observed in 1967 and nine (9) in both 1978 and 1992.

#### Village of Sister Bay

The coastal zone of the Village of Sister Bay consisted of 327.4 acres (132.6 ha) in 1967, 324.9 acres (131.6 ha) in 1978, and 311.8 acres (126.3 ha) in 1992. The results of the areal accuracy test (Table VIII) indicate the 1967 photos to be off by -1.33% from the USGS basis. The 1978 and 1992 photos deviated by +6.04% and -17.17% from the USGS basis respectively.

Residential land use increased from 67.0 acres (27.1 ha) in 1967 to 97.4 acres (39.4 ha) in 1978. In 1992, residential land increased further to 141.0 acres (57.1 ha). Of the 284 structures in this general use category, 36 were of the multi-family low-rise class and 185 of the single family/duplex class. The remaining 63 structures consisted of garages, sheds, and barns.

Commercial land also increased. In 1967, there were 13.0 acres (5.3 ha) devoted to commercial uses. This figure rose to 16.3 acres (6.6 ha) in 1978 and 32.4 acres (13.1 ha) in 1992. Of the 67 structures identified in this general land use category in 1992, 52 were observed in the central business district and fifteen (15) in the neighborhood business district.

Industrial land decreased over the three study years. In 1967, 10.1 acres (4.1 ha) were devoted to industrial uses. This figure dropped to 6.1 acres (2.5 ha) in 1978 and zero acres in 1992.

The Village of Sister Bay also experienced a decrease in the amount of agricultural and natural land use. From a 1967 figure of 220.3 acres (89.2 ha), agricultural and natural land use declined to 179.8 acres (72.8 ha) in 1978 and 111.6 acres (45.2 ha) in 1992. Solely agricultural land declined from 12.6 acres (5.1 ha) in 1967 to 5.5 acres (2.2 ha) and 0.7 acres (0.3 ha) in 1978 and 1992, respectively. Natural areas also declined. From a 1967 figure of 207.7 acres (84.1 ha), natural areas declined to 174.3 acres (70.6 ha) and 110.9 acres (44.9 ha) in 1978 and 1992, respectively.

The amount of recreational land stayed relatively stable over the three study years. The amount of land devoted to recreational uses in 1967 was 15.7 acres (6.4 ha). This figure declined slightly to 15.2 acres (6.2 ha) in 1978 and 13.6 acres (5.5 ha) in 1992.

The increase in shoreline modification in the Village of Sister Bay was not as dramatic as in other civil units. Between 1967 and 1978, sea walls and revetments taken together increased 48.1% (1627.7 feet [496.3 m]). Between 1978 and 1992, shoreline protection structures increased 15.3% (766.0 feet [233.5 m]). Sea walls increased from 2811.6 feet (857.2 m) in 1967 to 3535.8 feet (1078.0 m) in 1978 and to 4221.0 feet (1286.9 m) in 1992.

Revetments increased from 572.9 feet (174.7 m) in 1967 to 1476.4 feet (450.1 m) in 1978 to 1557.2 feet (474.8 m) in 1992.

The number of non-flow-through docks decreased from five (5) in 1967 to four (4) in 1978; however, this figure increased substantially to 23 in 1992. A single (1) groin was recorded in 1967. No groins were recorded in 1978 and 1992.

#### **Township of Liberty Grove**

The coastal zone for the Township of Liberty Grove was 4389.6 acres (1777.7 ha) in 1967, 4334.5 acres (1755.5 ha) in 1978, and 4173.1 acres (1690.2 ha) in 1992. No accuracy test was performed on this civil unit.

The amount of coastal zone dedicated to residential land uses was 175.6 acres (71.1 ha) in 1967. In 1978, this figure rose to 514.9 acres (208.5 ha). In 1992, there was a slight decline to 491.5 acres (199.0 ha). Of the 1044 residential structures recorded in the Township of Liberty Grove, 764 were single family/duplex and three (3) were multi-family low-rise residential. The remaining 277 structures consisted of garages, sheds, and barns.

Commercial land also increased. In 1967, 17.8 acres (7.2 ha) were classified as commercial land use. This figure increased to 21.6 acres (8.8 ha) in 1978 and 54.8 acres (22.1 ha) in 1992. All structures (128) recorded in this general use category were observed in the neighborhood business district.

Land use in the agricultural and natural general use category declined from 2973.1 acres (1204.2 ha) in 1967 to 2619.1 acres (1060.7 ha) and 2529.0 acres (1024.2 ha) in 1978 and 1992, respectively. Agricultural land use increased slightly from 138.9 acres (56.3 ha) in 1967 to 141.7 acres (57.4 ha) in 1978; however, agricultural land use dropped to 48.4 acres (19.6 ha) by 1992. Natural uses also declined. Between 1967 and 1978, the decline was greatest (2834.2 acres [1147.9 ha] to 2477.4 acres [1003.3 ha]). In 1992, natural land uses were up slightly to 2480.6 acres (1004.6 ha).

Overall, outdoor recreational land also decreased from 1199.0 acres (485.6 ha) in 1967 to 1113.4 acres (450.9 ha) in 1978, probably due to photographic enlargement error rather than actual loss. In 1992, recreational land use further decreased to 1053.3 acres (426.6 ha).

The increase of shoreline modification construction has remained steady between the three study years. An increase of 27.7% (2795.4 feet [852.3 m]) and 27.8% (3577.8 feet [1090.8 m]) took place from 1967 to 1978 and from 1978 to 1992, respectively. Sea wall construction stood at 8193.2 feet (2497.9 m) in 1967. This figure rose to 10087.8 feet (3075.5 m) in 1978 and 10652.6 feet (3247.7 m) in 1992. Revetments increased from 1884.2 feet (574.5 m) in 1967 to 2785.0 feet (849.1 m) and 5798.0 feet (1767.7 m) in 1978 and 1992, respectively.

Groin construction increased from seven (7) in 1967 to eight (8) in 1978, but fell to two (2) in 1992. Non-flow-through dock

construction increased from seventeen (17) in 1967 to 36 in 1978 and 44 in 1992.

#### **Township of Bailey's Harbor**

The coastal zone of the Township of Bailey's Harbor was 2256.0 acres (913.7 ha) in 1967, 2084.4 acres (844.2 ha) in 1978, and 2014.8 acres (816.0 ha) in 1992. A test for areal accuracy was performed on this community (Table VIII). Measurements taken from the 1967 photos fell within -1.43% of the USGS map measurements. The 1978 and 1992 photos deviated by -4.53% and -11.70%, respectively.

The amount of coastal zone devoted to residential uses rose from 128.0 acres (51.8 ha) in 1967 to 155.9 acres (63.1 ha) in 1978 and to 288.1 acres (116.6 ha) by 1992. Residential land stood at 5.7% of the coastal area in 1967, rose to 7.5% in 1978, and increased to 14.3% by 1992. There were 342 single family/duplex structures out of 514 total structures in this general use category. Remaining structures consisted of garages, sheds and barns.

Commercial land increased 94.5% (25.7 acres [10.4 ha]) from 1967 to 1992. In 1967, commercial land stood at 27.2 acres (11.0 ha). By 1978 and 1992, this figure increased to 49.2 acres (19.9 ha) and 52.9 acres (21.4 ha), respectively. Of the 93 total structures in this general use category, 42 belonged to the central business district, 50 to the neighborhood business district, and one (1) to the institutional class.

Agricultural and natural areas accounted for 92.9% of the total coastal zone in 1967. In 1978 and 1992, this figure decreased to 88.6% and 78.9%, respectively. Agricultural areas decreased from 12.5 acres (5.1 ha) in 1967 to 2.2 acres (0.9 ha) in 1978 and to 0.4 acres (0.2 ha) in 1992. Natural areas decreased from 2084.3 acres (844.1 ha) in 1967 to 1844.5 acres (747.0 ha) in 1978. In 1992, 1589.8 acres (643.9 ha) of natural areas were observed.

Outdoor recreational lands, non-existent in 1967, increased to 5.0 acres (2.0 ha) in 1978 and 42.3 acres (17.1 ha) in 1992.

After a 210.1% (6858.4 feet [2091.0 m]) increase between 1967 and 1978, the amount of shoreline with sea walls and revetments construction decreased 31.9% (3232.6 feet [985.5 m]) by 1992. There were 1229.6 feet (374.9 m) of sea walls recorded in 1967. In 1978, this figure increased to 4379.8 feet (1335.3 m), but shoreline with sea walls fell to 3243.0 feet (988.7 m) by 1992. Revetment construction increased from 2034.8 feet (620.4 m) in 1967 to 5743.0 feet (1750.9 m) by 1978; however, shoreline modified with revetments accounted for only 3647.2 feet (1112.0 m) by 1992.

In 1967, there were only four (4) non-flow-through docks in the Township of Bailey's Harbor. By 1978, only two (2) remained; nevertheless, by 1992, ten (10) were recorded. In 1978 only three (3) groins were identified. No groins were recorded in 1967 or 1992.

## **Township of Jacksonport**

In 1967, 764.8 acres (309.8 ha) comprised the coastal zone of Jacksonport Township. In 1978 and 1992, the coastal zone comprised 705.3 acres (285.6 ha) and 665.6 acres (269.5 ha), respectively. The 1992 coastal zone deviated from the 1967 coastal zone by 13.0%. Two tests of areal accuracy were performed (Table VIII). The 1967 photos fell within -6.36% and -5.42% of the USGS standard. The 1978 photos erred between -13.50% and 16.30%.

Residential land use increased from 8.8% (67.5 acres [27.3 ha]) of the total coastal zone in 1967 to 15.9% (112.4 acres [45.5 ha]) in 1978 and to 21.1% (140.6 acres [56.9 ha]) in 1992. Of the 313 structures found within this type, 228 were of the single family/duplex type. All remaining structures consisted of garages, sheds or barns.

Commercial land increased from a mere 0.5% (4.1 acres [1.7 ha]) of the coastal zone in 1967 to 1.9% (13.2 acres [5.3 ha]) in 1978 and 2.8% (18.9 acres [7.7 ha]) in 1992. Of the 41 structures recorded in this general use category, 29 were interpreted within the central business district. The remaining twelve (12) structures were found in the neighborhood business district.

Agricultural and natural land comprised 89.3% (683.2 acres [276.7 ha]) of the coastal zone in 1967. In 1978 and 1992, this general use category accounted for 79.3% (560.0 acres [226.9 ha]) and 73.6% (489.6 acres [198.3 ha]), respectively. Agricultural land increased from 31.4 acres (12.7 ha) in 1967 to 35.7 acres (14.5 ha) in 1978, yet no agricultural land use was observed in 1992. Natural areas declined from 651.8 acres (264.0 ha) in 1967 to 524.3 acres (212.3 ha) in 1978 and 489.6 acres (198.3 ha) in 1992.

Modification of the shoreline increased from a modest 122.8 feet (37.4 m) in 1967 to 845.4 feet (257.7 m) in 1978. By 1992, the combined sea wall/revetment figure had risen 282.7% from the 1978 figure to 3235.2 feet (986.3 m). Sea walls were nonexistent in 1967, but increased to 752.2 feet (229.3 m) by 1978, and further to 1654.4 feet (504.4 m) by 1992. Revetments decreased slightly from 122.8 feet (37.4 m) in 1967 to 93.2 feet (28.4 m) in 1978, yet increased dramatically to 1580.8 feet (482.0 m) by 1992.

A single (1) groin was recorded in Jacksonport Township in 1992. None were identified in previous study years. Likewise, a single (1) non-flow-through dock was recorded in 1978. None were present in 1967 or 1992.

## **Township of Sevastopol (Lakeshore)**

The coastal zone of the lakeshore portion of Sevastopol was found to be 957.6 acres (387.5 ha) in 1967. The 1978 and 1992 coastal zone total was 1077.1 acres (436.1 ha) and 942.3 acres (381.7 ha), respectively.



A linear accuracy test was performed on the photographs of this civil unit (Table VII). The 1967 and 1978 photos deviate from the USGS standard by +1.24% and +1.34%, respectively. The 1992 photos deviate from the USGS standard by -1.95%. While some of the error between the photos is explained by the linear accuracy test, there is a major discrepancy between the 1978 coastal zone and the coastal zone of the other study years. Considering the results of the linear test, it is likely that the remainder of the error can be explained by the lack of a "beach" type in the interpretive classification scheme.

Residential land increased from 5.6% (54.4 acres [22.0 ha]) of the coastal zone in 1967 to 12.6% (135.6 acres [54.9 ha]) in 1978 and to 13.7% (129.1 acres [52.3 ha]) of the total coastal zone of Sevastopol Township (Lakeshore) in 1992. Of the 340 structures found in the residential category, 289 were classified as single family/duplex.

Commercial land increased from 4.0 acres (1.6 ha) in 1967 to 6.6 acres (2.7 ha) and to 9.2 acres (3.7 ha) in 1978 and 1992, respectively. The ten (10) structures identified were all of the neighborhood business district class.

The agricultural and natural general use category accounted for 83.7% (801.6 acres [324.5 ha]) of the coastal zone in 1967. This category accounted for 57.6% (621.0 acres [251.4 ha]) in 1978 and 57.8% (544.4 acres [220.6 ha]) in 1992. Agricultural land stood at only 0.8 acres (0.3 ha) in 1967, no agricultural land was recorded in either 1978 or 1992. Consequently, virtually all of the decrease resulted in the loss of natural lands.

Recreational land increased from 95.4 acres (38.6 ha) in 1967 to 311.2 acres (126.0 ha) in 1978 largely due to the creation of Whitefish Dunes State Park after 1967. Only 257.1 acres (104.1 ha) were recorded in 1992, most likely due to photographic error.

Modification of the shoreline increased from a mere 285.1 feet (86.9 m) in 1967 to 1531.8 feet (467.0 m) and 3659.8 feet (1115.8 m) in 1978 and 1992, respectively. There was a small increase (209.2 feet [63.8 m]) in sea wall construction between 1967 and 1978; nevertheless, there was a drastic increase of 1919.2 feet (585 m) by 1992. Revetments increased from a modest 85.1 feet (25.9 m) in 1967 to 1122.6 feet (342.3 m) and 1331.4 feet (405.9 m) by 1978 and 1992, respectively.

There were no groins recorded in Sevastopol Township (Lakeshore) in any of the three study years. Not a single non-flow-through dock was recorded in 1967. However, one (1) dock was recorded in 1978, and two (2) in 1992.

#### **Township of Sturgeon Bay**

The coastal zone of the Township of Sturgeon Bay was 822.4 acres (333.1 ha) in 1967 and 797.1 acres (323.0 ha) in 1978. In 1992, 758.6 acres (307.1 ha) made up the coastal zone. The difference in coastal zone area between 1967 and 1978 is likely

due to photographic enlargement error; however between 1978 and 1992, the City of Sturgeon Bay annexed 19.2 acres from the Town of Sturgeon Bay. Consequently, the difference in the coastal zone between 1992 and the other study years is likely due to photographic enlargement errors and annexation.

Residential land went from being 5.7% (47.2 acres [19.1 ha]) of the coastal zone in 1967 to 16.4% (130.5 acres [52.9 ha]) in 1978. By 1992, 18.0% (136.9 acres [55.4 ha]) of the coastal zone was recorded as residential. Of the 355 residential structures, 244 belonged to the single family/duplex type.

Commercial land remained a very small part of the coastal zone of the Township of Sturgeon Bay during all three study years. Between 1967 and 1978, commercial land use increased from 3.2 acres (1.3 ha) to 8.8 acres (3.6 ha). By 1992, commercial land use only accounted for 6.9 acres (2.8 ha) or 0.9% of the total coastal zone. All twelve (12) structures recorded in this civil unit were classified as institutional.

Agricultural and natural lands accounted for 93.8% (771.6 acres [312.7 ha]) of the coastal zone in 1967. By 1978 and 1992, land in this general use category represented 79.0% (629.4 acres [254.9 ha]) and 79.1% (600.1 acres [243.0 ha]) of the coastal zone, respectively. Land devoted solely to agricultural uses decreased from 3.9 acres (1.6 ha) in 1967 to 2.6 acres (1.0 ha) in 1978 and to zero by 1992. Natural lands accounted for 767.7 acres (310.9 ha) of the coastal zone in 1967. However, by 1978 and 1992, only 626.8 acres (253.9 ha) and 600.1 acres (243.0 ha) remained, respectively.

No recreational land in 1967 increased to 26.3 acres (10.7 ha) or 3.3% of the 1978 coastal zone. By 1992, 13.7 acres (5.5 ha) of the coastal zone were classified as outdoor recreation.

Shoreline modifications increased 331.6% (2521.3 feet [768.7 m]) between 1967 and 1978. Between 1978 and 1992, growth of shoreline protection slowed to 191.2%. Sea wall construction increased from 309.5 feet (94.4 m) of shoreline in 1967 to 1907.6 feet (581.6 m) in 1978 and 3649.6 feet (1112.7 m) by 1992. Revetments increased from a modest 450.8 feet (137.4 m) in 1967 to 1374.0 feet (418.9 m) and 5906.0 feet (1800.6 m) in 1978 and 1992, respectively.

Two (2) groins were recorded in both 1967 and 1978. Only one (1) groin remained in 1992. No non-flow-through docks were identified in this civil unit in any of the three study years.

### **City of Sturgeon Bay**

The coastal zone consisted of 10.5 acres (4.2 ha) in 1967 and 9.2 acres (3.8 ha) in 1978. Between 1978 and 1992, the City of Sturgeon Bay annexed all the area previously belonging to the Township of Sturgeon Bay south of the Sturgeon Bay Shipping Canal. In 1992, the coastal zone was calculated to be 40.8 acres (16.5 ha).

There were 5.8 acres (2.3 ha) of residential land in 1967. By 1978 and 1992, 6.4 acres (2.6 ha) and 8.9 acres (3.6 ha) of

residential land were recorded. Of the eighteen (18) structures identified in this general use category in 1992, thirteen (13) were of the single family/duplex type. No commercial or industrial land was identified in the City of Sturgeon Bay's coastal zone.

In 1967, 4.7 acres (1.9 ha) or 44.8% of the coastal zone belonged to the agricultural and natural general use category. In 1978, this figure stood at only 4.3% (0.4 acres [0.2 ha]). With the annexed land, agricultural and natural lands accounted for 73.8% (30.1 acres [12.2 ha]) of the coastal zone by 1992. No active agricultural land was identified during the three study years.

No shoreline modification structures were present in 1967. In 1978, 95.4 feet (29.1 m) of sea wall were documented while in 1992, 221.8 feet (67.6 m) of revetment were documented. One (1) groin was recorded in 1978, and two (2) in 1992. No groins were identified in 1967. In addition, non-flow-through docks were not present in any of the three study years.

#### **Township of Clay Banks**

The coastal zone for this civil unit consisted of 768.5 acres (311.0 ha) in 1967, 761.5 acres (308.4 ha) in 1978, and 721.5 acres (292.3 ha) in 1992. Clay Banks was tested for linear accuracy (Table VII). The 1967 photos deviated by +1.26% from the USGS basis. The 1978 and 1992 photos were off by +1.66% and -3.59%, respectively.

Residential land increased from 2.6% (19.8 acres [8.0 ha]) of the coastal zone in 1967 to 5.8% (44.1 acres [17.9 ha]) in 1978. By 1992, 9.1% (65.4 acres [26.5 ha]) of the coastal zone was residential land. Of the 154 structures tallied in 1992, 98 were single family/duplex residences. No commercial or industrial land was recorded in the Township of Clay Banks over the three study years.

Agricultural and natural land uses decreased slightly between 1967 and 1992. In 1967, 96.4% (741.1 acres [300.0 ha]) fell into this category. By 1978 and 1992, this category accounted for 93.0% (708.3 acres [286.8 ha]) and 89.3% (644.1 acres [260.9]), respectively. Strictly agricultural land held steady at 191.9 acres (77.7 ha) between 1967 and 1978. By 1992, 62.6 acres (25.4 ha) were lost from the 1978 figure. Natural lands decreased from 549.2 acres (222.4 ha) in 1967 to 516.4 acres (209.1 ha) in 1978. Between 1978 and 1992, natural lands decreased by 1.6 acres (0.6 ha).

A modest increase in the amount of outdoor recreational land was seen over the three study years. In 1967, 6.5 acres (2.6 ha) were devoted to outdoor recreation. By 1978 and 1992, 6.9 acres (2.8 ha) and 8.3 acres (3.4 ha) of outdoor recreation land were recorded, respectively.

Shoreline modification increased 115.8% (487.4 feet [148.6 m]) between 1967 and 1978, and 392.9% (3568.8 feet [1088.0 m]) between 1978 and 1992. Sea wall construction increased from

289.7 feet (88.3 m) in 1967 to 180.0 feet (54.9 m) in 1978 and to 212.4 feet (64.8 m) in 1992. Revetment construction increased from 131.3 feet (40.0 m) in 1967 to 728.4 feet (222.1 m) in 1978 and to 4264.8 feet (1300.2 m) in 1992. Neither groins nor non-flow-through docks were found in Clay Banks Township in any of the three study years.

Table VII: LINEAR ACCURACY TESTS OF SELECTED COASTAL COMMUNITIES (1967-1992). Photoset measurements of each year compared to USGS maps (scale 1:24000).

Unit Test	1967	1978	1992	Error Range
Union	+0.37%	+1.57%	-1.14%	-1.14 to +1.57
Sevastopol (Bay)	+1.12%	+3.86%	-3.05%	-3.05 to +3.86
Sevastopol (Lake)	+1.24%	+1.34%	-1.95%	-1.95 to +1.34
Clay Banks	+1.26%	+1.66%	-3.59%	-3.59 to +1.66

Table VIII: AREAL ACCURACY TESTS OF SELECTED COASTAL COMMUNITIES (1967-1992). Photoset measurements of each year compared to USGS maps (scale 1:24000).

Test Number	1967	1978	1992	Error Range (%)
T. Egg Harbor (1)	+0.8%	+2.87%	NA	+0.8 to +2.87
T. Egg Harbor (2)	-8.49%	-6.19%	NA	-8.49 to -6.19
T. Egg Harbor (3)	+2.20%	+5.36%	NA	+2.20 to +5.36
T. Gibraltar (1)	+2.16%	+5.88%	-2.64%	-2.64 to +5.88
V. Ephraim (1)	-2.61%	+2.85%	-14.93%	-14.93 to +2.85
V. Ephraim (2)	+0.22%	NA	NA	+0.22
V. Ephraim (3)	+2.09%	+4.04%	-11.64%	-11.64 to +4.04
V. Sister Bay (1)	-1.33%	+6.04%	-17.17%	-17.17 to +6.04
V. Sister Bay (2)	-0.85%	NA	NA	-0.85
Bailey's Hrb. (1)	NA	NA	-11.8%	-11.8
Bailey's Hrb. (2)	-0.89%	NA	NA	-0.89
Bailey's Hrb. (3)	-1.43%	-4.53%	-11.70%	-11.70 to -1.43
Jacksonport (1)	-6.36%	-9.08%	-13.50%	-13.50 to -6.36
Jacksonport (2)	-1.00%	NA	NA	-1.00
Jacksonport (3)	-5.42%	-4.96%	-16.3%	-16.3 to -4.96

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**APPENDIX**

Door County Shoreland Assessment Project:  
1967 - 1992

County Summary Data Sheet

Year: 1967

County: Door County

Coastal Civil Jurisdiction included in summary (in alphabetical order).

City of Sturgeon Bay	Township of Sevastopol (Lake)
Township of Bailey's Harbor	Township of Sturgeon Bay
Township of Clay Banks	Township of Union
Township of Egg Harbor	Village of Egg Harbor
Township of Gardner	Village of Ephraim
Township of Gibraltar	Village of Sister Bay
Township of Jacksonport	
Township of Liberty Grove	
Township of Nasewaupsee	
Township of Sevastopol (Bay)	

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111	Res. units	5.4	2.2
	garages		
	sheds		
112	Res. units		
	garages		
	sheds		
113	Res. units	1516.2	614.1
	garages		
	sheds		
	barns		
115	Res. units	13.0	5.3
	garages		
	sheds		
	Subtotal	1534.6	621.5
<u>12 Commercial</u>			
121	Central Business Dist	47.0	19.0
122	Shopping Center/Mall		
124	Neighborhood Business Dist	91.6	37.1
126	Institutional	22.0	8.9
	Subtotal	160.6	65.0
<u>13 Industrial</u>			
138	Industrial Park	15.3	6.2

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____
142 Rail Transportation	_____	_____
143 Water Transportation	_____	_____
143.1 Private Marina	42.3	17.1
143.2 Public Boat Landing	11.1	4.5
144 Highways	_____	_____
145 Communications	1.3	0.5
146 Utilities	_____	_____
147 Sewage Treatment Plant	_____	_____
148 Landfill	_____	_____
Subtotal	54.7	22.1

17 Extractive

171 Open Pit	47.8	19.4
172 Underground	_____	_____
173 Well	_____	_____
179 Other Extractive	_____	_____
Subtotal	47.8	19.4

18 Agricultural and Natural

181 AF Abandoned Field	1445.3	585.4
182 AG Agriculture Active	1938.6	785.1
183 F Forest	8643.4	3500.6
184 H Heath	68.6	27.8
185 OW Open Water	60.5	24.5
186 RL Rock Ledge	169.1	68.5
187 SL Slump Zone	3.7	1.5
188 WT Wetland	2127.1	861.5
Subtotal	14,456.3	5854.9

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____
192 Urban Open Lots	13.3	5.4
193 Outdoor Recreation	2568.1	1040.1
194 Cemeteries	15.2	6.2
Subtotal	2596.6	1051.7

Uninterpreted Acres      261.4

Total Acres      19127.3  
Total Hectares      7746.6

Shoreline Modifications

		Linear
		Feet      Meters
195 Sea Walls	37,546	11,447.1
196 Revetments	24,145.8	7361.5
197 Groins	# of Groins	41
198 Dock Non-Flow-Through	# of Docks	68

Door County Shoreland Assessment Project:  
1967 - 1992

County Summary Data Sheet

Year: 1978  
 County: Door County  
 Coastal Civil Jurisdiction included in summary (in alphabetical order).

Township of Bailey's Harbor	Township of Liberty Grove
Township of Clay Banks	Township of Nasewaupée
Township of Egg Harbor	Township of Sevastopol (Bay)
Village of Egg Harbor	Township of Sevastopol (Lake)
Village of Ephraim	Village of Sister Bay
Township of Gardner	City of Sturgeon Bay
Township of Gibraltar	Township of Sturgeon Bay
Township of Jacksonport	Township of Union

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	7	9.4	3.8
garages	3		
sheds			
112 Res. units	12	15.7	6.4
garages			
sheds			
113 Res. units	3960	2689.6	1089.3
garages	871		
sheds	1245		
barns	45		
115 Res. units	259	48.1	19.5
garages			
sheds			
Subtotal	6402	2762.8	1119.0
<u>12 Commercial</u>			
121 Central Business Dist	167	57.2	23.2
122 Shopping Center/Mall			
124 Neighborhood Business Dist	295	158.7	64.3
126 Institutional	19	21.9	8.9
Subtotal	481	237.8	96.4
<u>13 Industrial</u>			
138 Industrial Park	10	6.1	2.5

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation		0.7	0.3
143 Water Transportation			
143.1 Private Marina	11	29.5	11.9
143.2 Public Boat Landing	21	38.4	15.6
144 Highways		7.7	3.1
145 Communications	5	2.0	0.8
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	37	78.3	31.7

**17 Extractive**

171 Open Pit	2	8.0	3.2
172 Underground			
173 Well			
179 Other Extractive		41.7	16.9
Subtotal	2	49.7	20.1

**18 Agricultural and Natural**

181 AF Abandoned Field		752.3	304.7
182 AG Agriculture Active		1701.3	689.0
183 F Forest		8360.7	3386.1
184 H Heath		68.7	27.8
185 OW Open Water		94.2	38.2
186 RL Rock Ledge		154.9	62.7
187 SL Slump Zone		2.3	0.9
188 WT Wetland		1236.9	500.9
Subtotal		12,371.3	5010.3

**19 Open Land, Other**

191 Outdoor-Public Assembly		8.1	3.3
192 Urban Open Lots	7	115.9	46.9
193 Outdoor Recreation	53	2748.7	1113.2
194 Cemeteries		50.1	20.3
Subtotal	60	2922.8	1183.7

Uninterpreted Acres	51.2	Total Acres	18,480.0
		Total Hectares	7484.4

**Shoreline Modifications**

		Linear	
		Feet	Meters
195 Sea Walls		75,226.4	22,934.9
196 Revetments		65,378.8	19,932.6
197 Groins	# of Groins		27
198 Dock Non-Flow-Through	# of Docks		64

Door County Shoreland Assessment Project:  
1967 - 1992

County Summary Data Sheet

Year: 1992  
 County: Door County  
 Coastal Civil Jurisdiction included in summary (in alphabetical order).  
 City of Sturgeon Bay                      Township of Sevastopol (Lake)  
 Township of Bailey's Harbor            Township of Sturgeon Bay  
 Township of Clay Banks                Township of Union  
 Township of Egg Harbor                Village of Egg Harbor  
 Township of Gardner                  Village of Ephraim  
 Township of Gibraltar                 Village of Sister Bay  
 Township of Jacksonport  
 Township of Liberty Grove  
 Township of Nasewaupsee  
 Township of Sevastopol (Bay)

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	128	114.5	46.4
garages	8		
sheds	14		
113 Res. units	4483	3088.0	1250.6
garages	939		
sheds	1111		
barns	44		
115 Res. units	208	44.7	18.1
garages			
sheds			
Subtotal	6935	3247.2	1315.1
<u>12 Commercial</u>			
121 Central Business Dist	368	154.1	62.4
122 Shopping Center/Mall			
124 Neighborhood Business Dist	278	133.3	54.0
126 Institutional	17	23.7	9.6
Subtotal	663	311.1	126.0
<u>13 Industrial</u>			
138 Industrial Park			

		Area	
	<u># of structures</u>	<u>Acres</u>	<u>Hectares</u>

14 Transportation

141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	20	43.4	17.6
143.2 Public Boat Landing	22	60.8	24.6
144 Highways		12.5	5.1
145 Communications	5	1.7	0.7
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	47	118.4	48.0

17 Extractive

171 Open Pit		23.8	9.6
172 Underground			
173 Well			
179 Other Extractive		25.2	10.2
Subtotal		49.0	19.8

18 Agricultural and Natural

181 AF Abandoned Field		648.5	262.6
182 AG Agriculture Active		1305.3	528.6
183 F Forest		7542.1	3054.6
184 H Heath		39.1	15.8
185 OW Open Water		83.0	33.6
186 RL Rock Ledge		107.8	43.7
187 SL Slump Zone		4.1	1.7
188 WT Wetland		1307.0	529.3
Subtotal		11,036.9	4469.9

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	7	74.8	30.3
193 Outdoor Recreation	42	2668.2	1080.6
194 Cemeteries		14.9	6.0
Subtotal	49	2757.9	1116.9

Uninterpreted Acres	19.2	Total Acres	17,539.7
		Total Hectares	7103.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		80,664.2	24,592.7
196 Revetments		79,525.8	24,245.7
197 Groins		# of Groins	29
198 Dock Non-Flow-Through		# of Docks	152



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
County: Door County  
Township, Village or City name: Township of Bailey's Harbor  
PLSS section data sheets included in summary (give full description):

T29 R28 sec.6,7  
T30 R28 Sec.2,9,10,11,14,15,16,17,20,21,22,27,28,29,31,32  
T31 R28 Sec.34,35

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units	_____	
garages	_____	
sheds	_____	
112 Res. units	_____	
garages	_____	
sheds	_____	
113 Res. units	_____	51.8
garages	_____	
sheds	_____	
barns	_____	
115 Res. units	_____	
garages	_____	
sheds	_____	
Subtotal		51.8
<u>12 Commercial</u>		
121 Central Business Dist	_____	3.4
122 Shopping Center/Mall	_____	
124 Neighborhood Business Dist	_____	6.5
126 Institutional	_____	1.1
Subtotal		11.0
<u>13 Industrial</u>		
138 Industrial Park	_____	

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	
142 Rail Transportation	_____	
143 Water Transportation	_____	
143.1 Private Marina	_____	1.0
143.2 Public Boat Landing	_____	
144 Highways	_____	
145 Communications	_____	0.5
146 Utilities	_____	
147 Sewage Treatment Plant	_____	
148 Landfill	_____	
Subtotal		1.5

17 Extractive

171 Open Pit	_____	
172 Underground	_____	
173 Well	_____	
179 Other Extractive	_____	
Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field	_____	27.3
182 AG Agriculture Active	_____	5.1
183 F Forest	_____	556.2
184 H Heath	_____	2.1
185 OW Open Water	_____	4.5
186 RL Rock Ledge	_____	48.5
187 SL Slump Zone	_____	
188 WT Wetland	_____	205.5
Subtotal		849.2

19 Open Land, Other

191 Outdoor-Public Assembly	_____	
192 Urban Open Lots	_____	0.2
193 Outdoor Recreation	_____	
194 Cemeteries	_____	
Subtotal		0.2

Total Acres      2256.0  
Total Hectares    913.7

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	1229.6	374.9
196 Revetments	_____	2034.8	620.4
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	4

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Bailey's Harbor  
 PLSS section data sheets included in summary (give full description):

T29 R28 sec.6,7  
 T30 R28 Sec.2,9,10,11,14,15,16,17,20,21,22,27,28,29,31,32  
 T31 R28 Sec.34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	256	155.9	63.1
garages	58		
sheds	78		
barns	1		
115 Res. units			
garages			
sheds			
Subtotal	393	155.9	63.1
<u>12 Commercial</u>			
121 Central Business Dist	43	13.6	5.5
122 Shopping Center/Mall			
124 Neighborhood Business Dist	41	30.1	12.2
126 Institutional	7	5.5	2.2
Subtotal	91	49.2	19.9
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation		0.7	0.3
143 Water Transportation			
143.1 Private Marina		6.6	2.7
143.2 Public Boat Landing			
144 Highways		2.7	1.1
145 Communications	5	2.0	0.8
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	5	12.0	4.9

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		27.1	11.0
182 AG Agriculture Active		2.2	0.9
183 F Forest		1392.1	563.8
184 H Heath		8.7	3.5
185 OW Open Water		13.0	5.3
186 RL Rock Ledge		81.0	32.8
187 SL Slump Zone			
188 WT Wetland		322.6	130.7
Subtotal		1846.7	748.0

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	15.6	6.3
193 Outdoor Recreation		5.0	2.0
194 Cemeteries			
Subtotal	1	20.6	8.3

Uninterpreted Acres 5.1

Total Acres 2089.5  
Total Hectares 846.2

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		4379.8	1335.3
196 Revetments		5743.0	1750.9
197 Groins	# of Groins		3
198 Dock Non-Flow-Through	# of Docks		2

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Bailey's Harbor  
 PLSS section data sheets included in summary (give full description):

T29 R28 Sec.6,7  
 T30 R28 Sec.2,9,10,11,14,15,16,17,20,21,22,27,28,29,31,32  
 T31 R28 Sec.34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	342	285.5	115.6
garages	71		
sheds	76		
barns	1		
115 Res. units	24	2.6	1.0
garages			
sheds			
Subtotal	514	288.1	116.6
<u>12 Commercial</u>			
121 Central Business Dist	42	13.1	5.3
122 Shopping Center/Mall			
124 Neighborhood Business Dist	50	27.7	11.2
126 Institutional	1	12.1	4.9
Subtotal	93	52.9	21.4
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	2.1	0.9
143.2 Public Boat Landing		26.0	10.5
144 Highways		3.2	1.3
145 Communications	5	1.7	0.7
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	6	33.0	13.4

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		63.9	25.9
182 AG Agriculture Active		0.4	0.2
183 F Forest		1233.9	499.7
184 H Heath		9.0	3.6
185 OW Open Water		9.6	3.9
186 RL Rock Ledge		65.8	26.6
187 SL Slump Zone			
188 WT Wetland		207.6	84.1
Subtotal		1590.2	644.0

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	7.9	3.2
193 Outdoor Recreation		42.3	17.1
194 Cemeteries		0.4	0.2
Subtotal	1	50.6	20.5

Total Acres 2014.8  
Total Hectares 815.9

Shoreline Modifications

		<u>Linear</u>	
		<u>Feet</u>	<u>Meters</u>
195 Sea Walls		3243.0	988.7
196 Revetments		3647.2	1112.0
197 Groins		# of Groins	
198 Dock Non-Flow-Through		# of Docks	10

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967

County: Door County

Township, Village or City name: Township of Clay Banks  
PLSS section data sheets included in summary (give full description):

T26 R26 Sec.3,4,9,16,21,28,29,32

LAND USE CATEGORIES

	Area	
	Acres	Hectares
<u>11 Residential</u>		
111 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
112 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
113 Res. units	19.8	8.0
garages	_____	_____
sheds	_____	_____
barns	_____	_____
115 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
Subtotal	19.8	8.0
<u>12 Commercial</u>		
121 Central Business Dist	_____	_____
122 Shopping Center/Mall	_____	_____
124 Neighborhood Business Dist	_____	_____
126 Institutional	_____	_____
Subtotal	_____	_____
<u>13 Industrial</u>		
138 Industrial Park	_____	_____

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____		
143.2 Public Boat Landing	_____		
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
	Subtotal		

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field	_____	217.4	88.0
182 AG Agriculture Active	_____	191.9	77.7
183 F Forest	_____	286.4	116.0
184 H Heath	_____	9.0	3.6
185 OW Open Water	_____	0.8	0.3
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____	3.7	1.5
188 WT Wetland	_____	31.9	12.9
	Subtotal	741.1	300.0

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____		
193 Outdoor Recreation	_____	6.5	2.6
194 Cemeteries	_____	1.1	0.4
	Subtotal	7.6	3.0

Total Acres      768.5  
Total Hectares    311.0

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	289.7	88.3
196 Revetments	_____	131.3	40.0
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	



**Door County Shoreland Assessment Project:  
1967 - 1992**

**Civil Jurisdiction  
Summary Data Sheet**

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Clay Banks  
 PLSS section data sheets included in summary (give full description):

T26 R26 Sec. 3, 4, 9, 16, 21, 28, 29, 31, 32

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
112 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
113 Res. units	70	44.1	17.9
garages	19	_____	_____
sheds	21	_____	_____
barns	10	_____	_____
115 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
Subtotal	120	44.1	17.9
<u>12 Commercial</u>			
121 Central Business Dist	_____	_____	_____
122 Shopping Center/Mall	_____	_____	_____
124 Neighborhood Business Dist	_____	_____	_____
126 Institutional	_____	_____	_____
Subtotal	_____	_____	_____
<u>13 Industrial</u>			
138 Industrial Park	_____	_____	_____

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal		

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field		148.9	60.3
182 AG Agriculture Active		191.9	77.7
183 F Forest		228.8	92.7
184 H Heath			
185 OW Open Water		0.8	0.3
186 RL Rock Ledge			
187 SL Slump Zone		2.3	0.9
188 WT Wetland		135.6	54.9
	Subtotal	708.3	286.8

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	1.0	0.4
193 Outdoor Recreation		6.9	2.8
194 Cemeteries		1.2	0.5
	Subtotal	9.1	3.7

Total Acres 761.5  
Total Hectares 308.4

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		180.0	54.9
196 Revetments		728.4	222.1
197 Groins	# of Groins		
198 Dock Non-Flow-Through	# of Docks		

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992

County: Door County

Township, Village or City name: Township of Clay Banks  
PLSS section data sheets included in summary (give full description):

T26 R26 Sec.3,4,9,16,21,28,29,31,32

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	98	65.4	26.5
garages	24		
sheds	29		
barns	3		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal	154	65.4	26.5
<u>12 Commercial</u>			
121 Central Business Dist	_____		
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____		
126 Institutional	_____		
Subtotal	_____		
<u>13 Industrial</u>			
138 Industrial Park	_____		

		Area	
	<u># of structures</u>	<u>Acres</u>	<u>Hectares</u>

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____		
143.2 Public Boat Landing	_____		
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
	Subtotal		

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field	_____	119.0	48.2
182 AG Agriculture Active	_____	129.3	52.4
183 F Forest	_____	186.5	75.5
184 H Heath	_____	1.9	0.8
185 OW Open Water	_____	0.3	0.1
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____	4.1	1.7
188 WT Wetland	_____	203.0	82.2
	Subtotal	644.1	260.9

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	3.0	1.2
193 Outdoor Recreation	_____	8.3	3.4
194 Cemeteries	_____	0.7	0.3
	Subtotal	12.0	4.9

Total Acres	721.5
Total Hectares	292.3

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	212.4	64.8
196 Revetments	_____	4264.8	1300.2
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Township of Egg Harbor  
 PLSS section data sheets included in summary (give full description):

T29 R26 Sec. 3,4,9,16,17,20,29,30,31,32  
 T30 R26 Sec. 13,25,34

LAND USE CATEGORIES

	Area	
	Acres	Hectares
<u>11 Residential</u>		
111 Res. units	5.4	2.2
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	62.5	25.3
garages		
sheds		
barns		
115 Res. units		
garages		
sheds		
Subtotal	67.9	27.5
<u>12 Commercial</u>		
121 Central Business Dist		
122 Shopping Center/Mall		
124 Neighborhood Business Dist	7.0	2.8
126 Institutional		
Subtotal	7.0	2.8
<u>13 Industrial</u>		
138 Industrial Park		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____
142 Rail Transportation	_____	_____
143 Water Transportation	_____	_____
143.1 Private Marina	0.4	0.2
143.2 Public Boat Landing	_____	_____
144 Highways	_____	_____
145 Communications	_____	_____
146 Utilities	_____	_____
147 Sewage Treatment Plant	_____	_____
148 Landfill	_____	_____
Subtotal	0.4	0.2

17 Extractive

171 Open Pit	_____	_____
172 Underground	_____	_____
173 Well	_____	_____
179 Other Extractive	_____	_____
Subtotal	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	83.6	33.9
182 AG Agriculture Active	93.1	37.7
183 F Forest	486.1	196.9
184 H Heath	_____	_____
185 OW Open Water	0.3	0.1
186 RL Rock Ledge	_____	_____
187 SL Slump Zone	_____	_____
188 WT Wetland	193.7	78.4
Subtotal	856.8	347.0

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____
192 Urban Open Lots	0.7	0.3
193 Outdoor Recreation	16.1	6.5
194 Cemeteries	_____	_____
Subtotal	16.8	6.8

Total Acres      948.6  
Total Hectares    384.3

Shoreline Modifications

	Linear	
	Feet	Meters
195 Sea Walls	1548.4	472.1
196 Revetments	1251.4	381.5
197 Groins	# of Groins	8
198 Dock Non-Flow-Through	# of Docks	3

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Egg Harbor  
 PLSS section data sheets included in summary (give full description):

T29 R26 Sec. 3,4,9,16,17,20,29,30,31,32  
 T30 R26 Sec. 13,34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	6	8.2	3.3
garages	3		
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	172	154.3	62.5
garages	37		
sheds	60		
barns			
115 Res. units			
garages			
sheds			
Subtotal	278	162.5	65.8
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	22	40.4	16.4
126 Institutional			
Subtotal	22	40.4	16.4
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.2	0.1
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		0.2	0.1

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		21.0	8.5
182 AG Agriculture Active		76.9	31.1
183 F Forest		558.6	226.2
184 H Heath			
185 OW Open Water		0.8	0.3
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		44.8	18.1
Subtotal		702.1	284.2

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		9.4	3.8
193 Outdoor Recreation	4	54.5	22.1
194 Cemeteries			
Subtotal	4	63.9	25.9

Total Acres 968.9  
Total Hectares 392.4

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		4188.6	1277.0
196 Revetments		504.2	153.7
197 Groins	# of Groins		1
198 Dock Non-Flow-Through	# of Docks		



Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992

County: Door County

Township, Village or City name: Township of Egg Harbor  
PLSS section data sheets included in summary (give full description):

T29 R26 Sec. 3,4,9,16,17,20,29,30,31,32

T30 R26 Sec. 13,34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	7	5.4	2.2
garages			
sheds	4		
113 Res. units	221	193.8	78.5
garages	57		
sheds	52		
barns	1		
115 Res. units			
garages			
sheds			
Subtotal	342	199.2	80.7
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	18	12.7	5.1
126 Institutional			
Subtotal	18	12.7	5.1
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing		0.8	0.3
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal	0.8	0.3

<u>17 Extractive</u>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	Subtotal		

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		42.0	17.0
182 AG Agriculture Active		89.5	36.2
183 F Forest		547.2	221.6
184 H Heath			
185 OW Open Water		0.4	0.2
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		13.6	5.5
	Subtotal	692.7	280.5

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		4.2	1.7
193 Outdoor Recreation		21.6	8.7
194 Cemeteries			
	Subtotal	25.8	10.4

Total Acres 931.2  
Total Hectares 377.0

		Linear	
		Feet	Meters
195 Sea Walls		686.8	209.4
196 Revetments		853.6	260.2
197 Groins	# of Groins		1
198 Dock Non-Flow-Through	# of Docks		5

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Village of Egg Harbor  
 PLSS section data sheets included in summary (give full description):

T30 R26 Sec 13,24,25,26,27,34,35

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	82.3	33.3	
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal	82.3	33.3	
<u>12 Commercial</u>			
121 Central Business Dist	6.5	2.6	
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	9.9	4.0	
126 Institutional	_____		
Subtotal	16.4	6.6	
<u>13 Industrial</u>			
138 Industrial Park	_____		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____	_____
142 Rail Transportation	_____	_____	_____
143 Water Transportation	_____	_____	_____
143.1 Private Marina	_____	8.1	3.3
143.2 Public Boat Landing	_____	1.4	0.6
144 Highways	_____	_____	_____
145 Communications	_____	_____	_____
146 Utilities	_____	_____	_____
147 Sewage Treatment Plant	_____	_____	_____
148 Landfill	_____	_____	_____
Subtotal	_____	9.5	3.9

17 Extractive

171 Open Pit	_____	_____	_____
172 Underground	_____	_____	_____
173 Well	_____	_____	_____
179 Other Extractive	_____	_____	_____
Subtotal	_____	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	_____	29.0	11.7
182 AG Agriculture Active	_____	14.7	6.0
183 F Forest	_____	330.7	133.9
184 H Heath	_____	_____	_____
185 OW Open Water	_____	0.8	0.3
186 RL Rock Ledge	_____	_____	_____
187 SL Slump Zone	_____	_____	_____
188 WT Wetland	_____	74.6	30.2
Subtotal	_____	449.8	182.1

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____	_____
192 Urban Open Lots	_____	0.3	0.1
193 Outdoor Recreation	_____	30.5	12.4
194 Cemeteries	_____	_____	_____
Subtotal	_____	30.8	12.5

Total Acres      588.8  
Total Hectares    238.4

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	6048.2	1844.0
196 Revetments	_____	3111.9	948.8
197 Groins	_____	# of Groins	6
198 Dock Non-Flow-Through	_____	# of Docks	11

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978

County: Door County

Township, Village or City name: Village of Egg Harbor

PLSS section data sheets included in summary (give full description):

T30 R26 Sec 13,24,25,26,27,34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	1	1.2	0.5
garages			
sheds			
112 Res. units	8	5.6	2.3
garages			
sheds			
113 Res. units	159	148.5	60.1
garages	26		
sheds	31		
barns			
115 Res. units			
garages			
sheds			
Subtotal	225	155.3	62.9
<u>12 Commercial</u>			
121 Central Business Dist	34	15.3	6.2
122 Shopping Center/Mall			
124 Neighborhood Business Dist	52	19.1	7.7
126 Institutional		1.1	0.4
Subtotal	86	35.5	14.3
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		4.8	1.9
143.2 Public Boat Landing		9.4	3.8
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal	14.2	5.7

**17 Extractive**

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	Subtotal		

**18 Agricultural and Natural**

181 AF Abandoned Field		18.4	7.5
182 AG Agriculture Active		37.0	15.0
183 F Forest		276.0	111.8
184 H Heath			
185 OW Open Water		2.9	1.1
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		36.3	14.7
	Subtotal	370.6	150.1

**19 Open Land, Other**

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	6.1	2.5
193 Outdoor Recreation	1	26.8	10.9
194 Cemeteries			
	Subtotal	2	32.9

Total Acres 608.5  
Total Hectares 246.4

**Shoreline Modifications**

		Linear	
		Feet	Meters
195 Sea Walls		8923.6	2720.6
196 Revetments		4158.2	1267.7
197 Groins		# of Groins	
198 Dock Non-Flow-Through		# of Docks	4

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Village of Egg Harbor  
 PLSS section data sheets included in summary (give full description):

T30 R26 Sec 13,24,25,26,27,34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	42	35.7	14.5
garages	4		
sheds	2		
113 Res. units	206	146.8	59.5
garages	25		
sheds	10		
barns	2		
115 Res. units			
garages			
sheds			
Subtotal	291	182.57	74.0
<u>12 Commercial</u>			
121 Central Business Dist	51	38.8	15.7
122 Shopping Center/Mall			
124 Neighborhood Business Dist	17	4.7	1.9
126 Institutional			
Subtotal	68	43.5	17.6
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	6.5	2.6
143.2 Public Boat Landing	1	6.9	2.8
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	2	13.4	5.5

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		17.0	6.9
182 AG Agriculture Active		5.0	2.0
183 F Forest		161.4	65.4
184 H Heath			
185 OW Open Water		0.2	0.1
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		52.3	21.2
Subtotal		235.9	95.6

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		4.7	1.9
193 Outdoor Recreation	6	64.6	26.2
194 Cemeteries			
Subtotal	6	69.3	28.1

Total Acres 544.6  
Total Hectares 220.8

Shoreline Modifications

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	8522.2	2598.2
196 Revetments	4245.4	1294.3
197 Groins	# of Groins	3
198 Dock Non-Flow-Through	# of Docks	12



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Village of Ephraim  
 PLSS section data sheets included in summary (give full description):

T31 R27 Sec.1,11,12,13,23,24

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	_____	96.4	39.0
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal		96.4	39.0
<u>12 Commercial</u>			
121 Central Business Dist	_____	5.5	2.2
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____	20.5	8.3
126 Institutional	_____	7.5	3.0
Subtotal		33.5	13.5
<u>13 Industrial</u>			
138 Industrial Park	_____		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____
142 Rail Transportation	_____	_____
143 Water Transportation	_____	_____
143.1 Private Marina	4.2	1.7
143.2 Public Boat Landing	1.1	0.4
144 Highways	_____	_____
145 Communications	_____	_____
146 Utilities	_____	_____
147 Sewage Treatment Plant	_____	_____
148 Landfill	_____	_____
Subtotal	5.3	2.1

17 Extractive

171 Open Pit	_____	_____
172 Underground	_____	_____
173 Well	_____	_____
179 Other Extractive	_____	_____
Subtotal	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	42.3	17.1
182 AG Agriculture Active	129.0	52.2
183 F Forest	198.2	80.3
184 H Heath	_____	_____
185 OW Open Water	_____	_____
186 RL Rock Ledge	_____	_____
187 SL Slump Zone	_____	_____
188 WT Wetland	9.0	3.6
Subtotal	378.5	153.2

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____
192 Urban Open Lots	0.1	0.04
193 Outdoor Recreation	41.0	16.6
194 Cemeteries	_____	_____
Subtotal	41.1	16.6

Total Acres      554.8  
Total Hectares    224.4

Shoreline Modifications

		Linear
		Feet      Meters
195 Sea Walls	2012.4	613.5
196 Revetments	1653.9	504.2
197 Groins	# of Groins	4
198 Dock Non-Flow-Through	# of Docks	4

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Village of Ephraim  
 PLSS section data sheets included in summary (give full description):

T31 R27 Sec.1,11,12,13,23,24

LAND USE CATEGORIES

	# of structures	Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	4	10.1	4.1
garages			
sheds			
113 Res. units	242	148.1	60.0
garages	47		
sheds	50		
barns			
115 Res. units			
garages			
sheds			
Subtotal	343	158.2	64.1
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	27	12.4	5.0
126 Institutional	1	1.9	0.8
Subtotal	28	14.3	5.8
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	4	4.1	1.7
143.2 Public Boat Landing		1.0	0.4
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	4	5.1	2.1

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		39.4	16.0
182 AG Agriculture Active		21.4	8.7
183 F Forest		229.9	93.1
184 H Heath			
185 OW Open Water			
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland			
Subtotal		290.7	117.8

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		2.7	1.1
193 Outdoor Recreation		88.5	35.8
194 Cemeteries			
Subtotal		91.2	36.9

Total Acres 559.4  
Total Hectares 226.7

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		5473.2	1668.7
196 Revetments		4058.0	1237.2
197 Groins	# of Groins		1
198 Dock Non-Flow-Through	# of Docks		9

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Village of Ephraim  
 PLSS section data sheets included in summary (give full description):

T31 R27 Sec.1,11,12,13,23,24

LAND USE CATEGORIES

	# of structures	Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	20	14.9	6.0
garages			
sheds	8		
113 Res. units	213	174.2	70.6
garages	32		
sheds	29		
barns			
115 Res. units			
garages			
sheds			
Subtotal	302	189.1	76.6
<u>12 Commercial</u>			
121 Central Business Dist	85	35.3	14.3
122 Shopping Center/Mall			
124 Neighborhood Business Dist		1.5	0.6
126 Institutional	3	1.2	0.5
Subtotal	88	38.0	15.4
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	5	4.3	1.7
143.2 Public Boat Landing	1	1.1	0.4
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	6	5.4	2.1

<u>17 Extractive</u>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		20.4	8.3
182 AG Agriculture Active			
183 F Forest		174.2	70.6
184 H Heath			
185 OW Open Water		0.4	0.2
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		4.1	1.7
Subtotal		199.1	80.8

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots			
193 Outdoor Recreation	2	81.5	33.0
194 Cemeteries			
Subtotal	2	81.5	33.0

Total Acres 513.1  
Total Hectares 207.9

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	5575.4	1699.8
196 Revetments	4786.8	1459.4
197 Groins	# of Groins	2
198 Dock Non-Flow-Through	# of Docks	9

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967

County: Door County

Township, Village or City name: Township of Gardner

PLSS section data sheets included in summary (give full description):

T27 R23 Sec. 13, 24, 25, 26, 34, 35

T27 R24 Sec. 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 18, 19

T28 R24 Sec. 25, 33, 34, 35, 36

LAND USE CATEGORIES

	Area	
	Acres	Hectares
<u>11 Residential</u>		
111 Res. units		
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	233.5	94.6
garages		
sheds		
barns		
115 Res. units	1.2	0.5
garages		
sheds		
Subtotal	234.7	95.1
<u>12 Commercial</u>		
121 Central Business Dist		
122 Shopping Center/Mall		
124 Neighborhood Business Dist		
126 Institutional		
Subtotal		
<u>13 Industrial</u>		
138 Industrial Park		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____
142 Rail Transportation	_____	_____
143 Water Transportation	_____	_____
143.1 Private Marina	1.8	0.7
143.2 Public Boat Landing	0.4	0.2
144 Highways	_____	_____
145 Communications	_____	_____
146 Utilities	_____	_____
147 Sewage Treatment Plant	_____	_____
148 Landfill	_____	_____
Subtotal	2.2	0.9

17 Extractive

171 Open Pit	_____	_____
172 Underground	_____	_____
173 Well	_____	_____
179 Other Extractive	_____	_____
Subtotal	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	313.6	127.0
182 AG Agriculture Active	776.3	314.4
183 F Forest	379.0	153.5
184 H Heath	_____	_____
185 OW Open Water	12.0	4.9
186 RL Rock Ledge	_____	_____
187 SL Slump Zone	_____	_____
188 WT Wetland	168.9	68.4
Subtotal	1649.8	668.2

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____
192 Urban Open Lots	1.9	0.8
193 Outdoor Recreation	2.6	1.1
194 Cemeteries	_____	_____
Subtotal	4.5	1.9

Total Acres      1891.2  
Total Hectares    766.1

Shoreline Modifications

		Linear
		Feet      Meters
195 Sea Walls	5833.9	1778.6
196 Revetments	3527.7	1075.5
197 Groins	# of Groins	3
198 Dock Non-Flow-Through	# of Docks	2



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978

County: Door County

Township, Village or City name: Township of Gardner

PLSS section data sheets included in summary (give full description):

T27 R23 Sec. 24, 25, 26, 34, 35, 36

T27 R24 Sec. 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 18, 19

T28 R24 Sec. 25, 33, 34, 35, 36

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	573	329.0	133.2
garages	112		
sheds	283		
barns	27		
115 Res. units	74	19.7	8.0
garages			
sheds			
<b>Subtotal</b>	<b>1069</b>	<b>348.7</b>	<b>141.2</b>

12 Commercial

121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	1	5.7	2.3
126 Institutional			
<b>Subtotal</b>	<b>1</b>	<b>5.7</b>	<b>2.3</b>

13 Industrial

138 Industrial Park			
---------------------	--	--	--

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.4	0.2
143.2 Public Boat Landing		8.2	3.3
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	<b>Subtotal</b>	<b>8.6</b>	<b>3.5</b>

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	<b>Subtotal</b>		

18 Agricultural and Natural

181 AF Abandoned Field		203.3	82.3
182 AG Agriculture Active		799.4	323.8
183 F Forest		331.8	134.4
184 H Heath			
185 OW Open Water		18.1	7.3
186 RL Rock Ledge		1.0	0.4
187 SL Slump Zone			
188 WT Wetland		139.1	56.3
	<b>Subtotal</b>	<b>1492.7</b>	<b>604.5</b>

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	2	16.0	6.5
193 Outdoor Recreation	1	2.0	0.8
194 Cemeteries			
	<b>Subtotal</b>	<b>3</b>	<b>18.0</b>

Total Acres 1873.7  
Total Hectares 758.8

Shoreline Modifications

		<u>Linear</u>	
		<u>Feet</u>	<u>Meters</u>
195 Sea Walls		11633.4	3546.8
196 Revetments		22357.8	6816.4
197 Groins		<u># of Groins</u>	
198 Dock Non-Flow-Through		<u># of Docks</u>	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992

County: Door County

Township, Village or City name: Township of Gardner

PLSS section data sheets included in summary (give full description):

T27 R23 Sec. 23, 24, 25, 26, 34, 35

T27 R24 Sec. 1, 2, 3, 4, 5, 7, 8, 10, 11, 12, 18, 19

T28 R24 Sec. 25, 33, 34, 35, 36

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
112 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
113 Res. units	522	359.1	145.4
garages	127	_____	_____
sheds	270	_____	_____
barns	23	_____	_____
115 Res. units	72	20.5	8.3
garages	_____	_____	_____
sheds	_____	_____	_____
Subtotal	1014	379.6	153.7
 <u>12 Commercial</u>			
121 Central Business Dist	_____	_____	_____
122 Shopping Center/Mall	_____	_____	_____
124 Neighborhood Business Dist	4	3.0	1.2
126 Institutional	_____	_____	_____
Subtotal	4	3.0	1.2
 <u>13 Industrial</u>			
138 Industrial Park	_____	_____	_____

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	4	7.7	3.1
143.2 Public Boat Landing	1	2.5	1.0
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	5	10.2	4.1

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive		1.3	0.5
Subtotal		1.3	0.5

18 Agricultural and Natural

181 AF Abandoned Field		74.3	30.1
182 AG Agriculture Active		734.8	297.6
183 F Forest		362.9	147.0
184 H Heath		2.3	0.9
185 OW Open Water		15.8	6.4
186 RL Rock Ledge		1.5	0.6
187 SL Slump Zone			
188 WT Wetland		158.0	64.0
Subtotal		1349.6	546.6

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots	2	13.7	5.5
193 Outdoor Recreation		3.3	1.3
194 Cemeteries		1.2	0.5
Subtotal	2	18.2	7.3

Total Acres 1761.9  
Total Hectares 713.9

Shoreline Modifications

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	14145.2	4312.6
196 Revetments	16639.2	5072.9
197 Groins	<u># of Groins</u>	6
198 Dock Non-Flow-Through	<u># of Docks</u>	0

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967

County: Door County

Township, Village or City name: Township of Gibraltar

PLSS section data sheets included in summary (give full description):

T30 R27 Sec. 6,7,18,31

T31 R27 Sec 14,15,20,22,28,29,32

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units		
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	60.4	24.5
garages		
sheds		
barns		
115 Res. units		
garages		
sheds		
Subtotal	60.4	24.5
<u>12 Commercial</u>		
121 Central Business Dist	7.6	3.1
122 Shopping Center/Mall		
124 Neighborhood Business Dist	4.1	1.7
126 Institutional	2.5	1.0
Subtotal	14.2	5.8
<u>13 Industrial</u>		
138 Industrial Park		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____	_____
142 Rail Transportation	_____	_____	_____
143 Water Transportation	_____	_____	_____
143.1 Private Marina	_____	8.5	3.4
143.2 Public Boat Landing	_____	1.1	0.4
144 Highways	_____	_____	_____
145 Communications	_____	_____	_____
146 Utilities	_____	_____	_____
147 Sewage Treatment Plant	_____	_____	_____
148 Landfill	_____	_____	_____
Subtotal	_____	9.6	3.8

17 Extractive

171 Open Pit	_____	_____	_____
172 Underground	_____	_____	_____
173 Well	_____	_____	_____
179 Other Extractive	_____	_____	_____
Subtotal	_____	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	_____	30.5	12.4
182 AG Agriculture Active	_____	10.1	4.1
183 F Forest	_____	442.5	179.2
184 H Heath	_____	_____	_____
185 OW Open Water	_____	1.4	0.6
186 RL Rock Ledge	_____	_____	_____
187 SL Slump Zone	_____	_____	_____
188 WT Wetland	_____	13.7	5.5
Subtotal	_____	498.2	201.8

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____	_____
192 Urban Open Lots	_____	2.3	0.9
193 Outdoor Recreation	_____	801.8	324.7
194 Cemeteries	_____	_____	_____
Subtotal	_____	803.1	325.6

368.6 acres added to 193 for a  
total of 801.8 acres

Total Acres      1386.5  
Total Hectares    561.5

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	1734.6	528.8
196 Revetments	_____	2440.0	743.9
197 Groins	_____	# of Groins	_____
198 Dock Non-Flow-Through	_____	# of Docks	_____

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Gibraltar  
 PLSS section data sheets included in summary (give full description):

T30 R27 Sec. 6,7,18  
 T31 R27 Sec 9,14,15,16,17,20,21,22,28,29,31,32

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	192	107.9	43.7
garages	37		
sheds	52		
barns			
115 Res. units			
garages			
sheds			
Subtotal	281	107.9	43.7
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	30	5.8	2.3
126 Institutional			
Subtotal	30	5.8	2.3
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.1	0.04
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal	0.1	0.04

<b>17 Extractive</b>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	Subtotal		

<b>18 Agricultural and Natural</b>			
181 AF Abandoned Field		13.4	5.4
182 AG Agriculture Active		8.9	3.6
183 F Forest		422.2	171.0
184 H Heath		0.4	0.2
185 OW Open Water		1.8	0.7
186 RL Rock Ledge		4.2	1.7
187 SL Slump Zone			
188 WT Wetland		10.9	0.4
	Subtotal	451.8	183.0

<b>19 Open Land, Other</b>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		1.2	0.5
193 Outdoor Recreation	34	774.6	313.7
194 Cemeteries			
	Subtotal	34	775.8
			314.2

Total Acres 1341.4  
Total Hectares 543.2

		Linear	
		Feet	Meters
195 Sea Walls		2418.8	737.4
196 Revetments		823.4	251.0
197 Groins	# of Groins	3	
198 Dock Non-Flow-Through	# of Docks	6	



Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Gibraltar  
 PLSS section data sheets included in summary (give full description):

T30 R27 Sec. 6,7,18  
 T31 R27 Sec 9,15,16,17,20,21,22,29,31,32

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	12	12.4	5.0
garages	2		
sheds			
113 Res. units	123	129.2	52.3
garages	18		
sheds	6		
barns			
115 Res. units			
garages			
sheds			
Subtotal	161	141.6	57.3
<u>12 Commercial</u>			
121 Central Business Dist	109	26.8	10.9
122 Shopping Center/Mall			
124 Neighborhood Business Dist	5	2.2	0.9
126 Institutional			
Subtotal	114	29.0	11.8
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	4.0	1.6
143.2 Public Boat Landing		0.2	0.1
144 Highways		4.6	1.9
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	1	8.8	3.6

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		3.4	1.4
182 AG Agriculture Active		9.0	3.6
183 F Forest		341.2	138.2
184 H Heath			
185 OW Open Water			
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		6.6	2.7
Subtotal		360.2	145.9

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots			
193 Outdoor Recreation	21	728.8	295.2
194 Cemeteries			
Subtotal	21	728.8	295.2

Total Acres 1268.4  
Total Hectares 513.8

Shoreline Modifications

		<u>Linear</u>	
		<u>Feet</u>	<u>Meters</u>
195 Sea Walls		2984.6	909.9
196 Revetments		3207.8	978.0
197 Groins		# of Groins	3
198 Dock Non-Flow-Through		# of Docks	11

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Township of Jacksonport  
 PLSS section data sheets included in summary (give full description):

T29 R27 Sec. 1,11,12,13,14,22,23,26,27,34,35

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	_____	67.5	27.3
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal		67.5	27.3
<u>12 Commercial</u>			
121 Central Business Dist	_____	2.1	0.9
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____	0.2	0.1
126 Institutional	_____	1.8	0.7
Subtotal		4.1	1.7
<u>13 Industrial</u>			
138 Industrial Park	_____		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____		
143.2 Public Boat Landing	_____	0.2	0.1
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
	Subtotal	0.2	0.1

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field	_____	67.2	27.2
182 AG Agriculture Active	_____	31.4	12.7
183 F Forest	_____	515.8	208.9
184 H Heath	_____	3.1	1.3
185 OW Open Water	_____	0.2	0.1
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____		
188 WT Wetland	_____	65.5	26.5
	Subtotal	683.2	276.7

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	1.3	0.5
193 Outdoor Recreation	_____	6.3	2.6
194 Cemeteries	_____	2.2	0.9
	Subtotal	9.8	4.0

Total Acres      764.8  
Total Hectares    309.8

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____		
196 Revetments	_____	122.8	37.4
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Jacksonport  
 PLSS section data sheets included in summary (give full description):

T29 R27 Sec. 1,11,12,13,14,22,23,26,27,34,35

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	192	112.4	45.5
garages	22		
sheds	40		
barns	2		
115 Res. units			
garages			
sheds			
Subtotal	256	112.4	45.5
<u>12 Commercial</u>			
121 Central Business Dist	27	8.5	3.4
122 Shopping Center/Mall			
124 Neighborhood Business Dist	12	3.2	1.3
126 Institutional	1	1.5	0.6
Subtotal	40	13.2	5.3
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.8	0.3
143.2 Public Boat Landing		2.3	0.9
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		3.1	1.2

17 Extractive

171 Open Pit	2	3.3	1.3
172 Underground			
173 Well			
179 Other Extractive			
Subtotal	2	3.3	1.3

18 Agricultural and Natural

181 AF Abandoned Field		19.7	8.0
182 AG Agriculture Active		35.7	14.5
183 F Forest		486.1	196.9
184 H Heath		2.1	0.9
185 OW Open Water		1.2	0.5
186 RL Rock Ledge		1.5	0.6
187 SL Slump Zone			
188 WT Wetland		13.7	5.5
Subtotal		560.0	226.9

19 Open Land, Other

191 Outdoor-Public Assembly		5.6	2.3
192 Urban Open Lots			
193 Outdoor Recreation	1	4.4	1.8
194 Cemeteries		3.3	1.3
Subtotal	1	13.3	5.4

Total Acres 705.3  
Total Hectares 285.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		752.2	229.3
196 Revetments		93.2	28.4
197 Groins	# of Groins		
198 Dock Non-Flow-Through	# of Docks		1

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Jacksonport  
 PLSS section data sheets included in summary (give full description):

T29 R27 Sec. 1,11,12,13,14,22,23,26,27,34,35

LAND USE CATEGORIES

	# of structures	Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	228	140.6	56.9
garages	43		
sheds	42		
barns			
115 Res. units			
garages			
sheds			
Subtotal	313	140.6	56.9
<u>12 Commercial</u>			
121 Central Business Dist	29	11.5	4.7
122 Shopping Center/Mall			
124 Neighborhood Business Dist	12	6.2	2.5
126 Institutional		1.2	0.5
Subtotal	41	18.9	7.7
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.7	0.3
143.2 Public Boat Landing			
144 Highways		2.0	0.8
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		2.7	1.1

<u>17 Extractive</u>			
171 Open Pit		7.0	2.8
172 Underground			
173 Well			
179 Other Extractive			
Subtotal		7.0	2.8

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		32.3	13.0
182 AG Agriculture Active			
183 F Forest		442.6	179.3
184 H Heath		4.7	1.9
185 OW Open Water		0.6	0.2
186 RL Rock Ledge		3.1	1.3
187 SL Slump Zone			
188 WT Wetland		6.3	2.6
Subtotal		489.6	198.3

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		1.3	0.5
193 Outdoor Recreation		4.8	1.9
194 Cemeteries		0.7	0.3
Subtotal		6.8	2.7

Total Acres 665.6  
Total Hectares 269.5

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	1654.4	504.4
196 Revetments	1580.8	482.0
197 Groins	# of Groins	1
198 Dock Non-Flow-Through	# of Docks	



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Township of Liberty Grove  
 PLSS section data sheets included in summary (give full description):

T31 R28 Sec.1,7,11,12,13,14,15,22,23,24,25,26,27  
 T32 R28 Sec.1,2,3,10,11,14,15,16,17,20,21,24,25,29,32,36  
 T32 R29 Sec.4,6,8,9,16,17,19,20,21,28,29,30,32,33  
 T33 R28 Sec.35  
 T33 R29 Sec.31,32,33

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	_____	175.6	71.1
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal		175.6	71.1
<u>12 Commercial</u>			
121 Central Business Dist	_____	5.3	2.1
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____	11.1	4.5
126 Institutional	_____	1.4	0.6
Subtotal		17.8	7.2
<u>13 Industrial</u>			
138 Industrial Park	_____	5.2	2.1

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____	11.7	4.7
143.2 Public Boat Landing	_____	4.0	1.6
144 Highways	_____		
145 Communications	_____	0.1	0.04
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
	Subtotal	15.8	6.3

17 Extractive

171 Open Pit	_____	0.8	0.3
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
	Subtotal	0.8	0.3

18 Agricultural and Natural

181 AF Abandoned Field	_____	120.2	48.7
182 AG Agriculture Active	_____	138.9	56.3
183 F Forest	_____	1921.2	778.1
184 H Heath	_____		
185 OW Open Water	_____	7.1	2.9
186 RL Rock Ledge	_____	42.4	17.2
187 SL Slump Zone	_____		
188 WT Wetland	_____	743.3	301.0
	Subtotal	2973.1	1204.2

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	0.5	0.2
193 Outdoor Recreation	_____	1199.0	485.6
194 Cemeteries	_____	1.8	0.7
	Subtotal	1201.3	486.5

Uninterpreted acres    261.4

Total Acres    4651.0  
Total Hectares 1883.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	8193.2	2497.9
196 Revetments	_____	1884.2	574.5
197 Groins	_____	# of Groins	7
198 Dock Non-Flow-Through	_____	# of Docks	17

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Liberty Grove  
 PLSS section data sheets included in summary (give full description):

T31 R28 Sec.1,7,12,13,14,15,22,23,24,25,26,27  
 T32 R28 Sec.1,2,3,10,11,14,15,16,19,20,21,24,25,29,32,36  
 T32 R29 Sec.4,6,8,9,16,17,20,21,28,29,32,33  
 T33 R28 Sec.35  
 T33 R29 Sec.31,32,33

LAND USE CATEGORIES

	# of structures	Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	637	514.9	208.5
garages	130		
sheds	194		
barns	2		
115 Res. units			
garages			
sheds			
Subtotal	963	514.9	208.5
<u>12 Commercial</u>			
121 Central Business Dist	18	4.9	2.0
122 Shopping Center/Mall			
124 Neighborhood Business Dist	48	13.8	5.6
126 Institutional	1	2.9	1.2
Subtotal	67	21.6	8.8
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	5	4.7	1.9
143.2 Public Boat Landing	17	9.3	3.8
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	22	14.0	5.7

**17 Extractive**

171 Open Pit		4.7	1.9
172 Underground			
173 Well			
179 Other Extractive			
Subtotal		4.7	1.9

**18 Agricultural and Natural**

181 AF Abandoned Field		57.2	23.2
182 AG Agriculture Active		141.7	57.4
183 F Forest		2133.7	864.1
184 H Heath			
185 OW Open Water		20.8	8.4
186 RL Rock Ledge		66.6	27.0
187 SL Slump Zone			
188 WT Wetland		199.1	80.6
Subtotal		2619.1	1060.7

**19 Open Land, Other**

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	11.6	4.7
193 Outdoor Recreation	4	1113.4	450.9
194 Cemeteries		35.2	14.3
Subtotal	5	1160.2	469.9

Uninterpreted acres 37.4

Total Acres 4371.9  
Total Hectares 1770.6

**Shoreline Modifications**

		Linear	
		Feet	Meters
195 Sea Walls		10,087.8	3075.5
196 Revetments		2785.0	849.1
197 Groins	# of Groins		8
198 Dock Non-Flow-Through	# of Docks		36

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Liberty Grove  
 PLSS section data sheets included in summary (give full description):

T31 R28 Sec.1,7,12,13,14,15,22,23,24,25,26,27  
 T32 R28 Sec.1,2,3,10,11,14,15,16,19,20,21,24,25,28,29,30,32,36  
 T32 R29 Sec.4,6,8,9,16,17,21,32,33  
 T33 R28 Sec.35  
 T33 R29 Sec.31,32,33

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	3	1.6	0.6
garages			
sheds			
113 Res. units	764	489.9	198.4
garages	152		
sheds	121		
barns	4		
115 Res. units			
garages			
sheds			
Subtotal	1044	491.5	199.0
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	128	53.2	21.5
126 Institutional		1.6	0.6
Subtotal	128	54.8	22.1
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	7	10.7	4.3
143.2 Public Boat Landing	19	12.3	5.0
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	26	23.0	9.3

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		110.9	44.9
182 AG Agriculture Active		48.4	19.6
183 F Forest		2037.5	825.2
184 H Heath		1.1	0.4
185 OW Open Water		19.6	7.9
186 RL Rock Ledge		34.3	13.9
187 SL Slump Zone			
188 WT Wetland		277.2	112.3
Subtotal		2529.0	1024.2

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		20.4	8.3
193 Outdoor Recreation	7	1053.3	426.6
194 Cemeteries		1.7	0.7
Subtotal	7	1075.4	435.6

Uninterpreted acres 19.2

Total Acres 4192.9  
Total Hectares 1698.0

Shoreline Modifications

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	10,652.6	3247.7
196 Revetments	5798.0	1767.7
197 Groins	# of Groins	2
198 Dock Non-Flow-Through	# of Docks	44

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967

County: Door County

Township, Village or City name: Township of Nasewaupee  
PLSS section data sheets included in summary (give full description):

T27 R25 Sec.6

T28 R25 Sec.21,22,23,25,26,27,28,30,31,32,33,36

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
112 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
113 Res. units	194.0	78.6
garages	_____	_____
sheds	_____	_____
barns	_____	_____
115 Res. units	4.2	1.7
garages	_____	_____
sheds	_____	_____
Subtotal	198.2	80.3
<u>12 Commercial</u>		
121 Central Business Dist	_____	_____
122 Shopping Center/Mall	_____	_____
124 Neighborhood Business Dist	6.5	2.6
126 Institutional	1.1	0.4
Subtotal	7.6	3.0
<u>13 Industrial</u>		
138 Industrial Park	_____	_____

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____	1.5	0.6
143.2 Public Boat Landing	_____	0.2	0.1
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
Subtotal		1.7	0.7

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field	_____	89.4	36.2
182 AG Agriculture Active	_____	68.9	27.9
183 F Forest	_____	508.2	205.8
184 H Heath	_____		
185 OW Open Water	_____	18.8	7.6
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____		
188 WT Wetland	_____	209.5	84.8
Subtotal		894.8	362.3

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	3.9	1.6
193 Outdoor Recreation	_____	334.8	135.6
194 Cemeteries	_____		
Subtotal		338.7	137.2

Total Acres      1441.0  
Total Hectares    620.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	3825.5	1166.3
196 Revetments	_____	4482.6	1366.6
197 Groins	_____	# of Groins	4
198 Dock Non-Flow-Through	_____	# of Docks	6



Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978

County: Door County

Township, Village or City name: Township of Nasewaupee

PISS section data sheets included in summary (give full description):

T27 R25 Sec.6

T23 R25 Sec.21,22,23,25,26,27,28,30,31,32,33,36

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>1 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	414	232.4	94.1
garages	140		
sheds	128		
barns			
115 Res. units	76	11.2	4.5
garages			
sheds			
Subtotal	758	243.6	98.6
<u>1 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	24	5.7	2.3
126 Institutional			
Subtotal	24	5.7	2.3
<u>1 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.4	0.2
143.2 Public Boat Landing		5.5	2.2
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal	5.9	2.4

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field		47.5	19.2
182 AG Agriculture Active		59.1	23.9
183 F Forest		446.3	180.8
184 H Heath			
185 OW Open Water		23.7	9.6
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		185.9	75.3
	Subtotal	762.5	308.8

19 Open Land, Other

191 Outdoor-Public Assembly		2.5	1.0
192 Urban Open Lots		30.6	12.4
193 Outdoor Recreation	3	281.6	114.0
194 Cemeteries			
	Subtotal	3	314.7
		127.4	

Total Acres 1332.4  
Total Hectares 539.5

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		9766.4	2977.6
196 Revetments		12418.4	3786.1
197 Groins		# of Groins	3
198 Dock Non-Flow-Through		# of Docks	1

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992

County: Door County

Township, Village or City name: Township of Nasewaupee  
PLSS section data sheets included in summary (give full description):

T27 R25 Sec.6

T28 R25 Sec.21,22,23,25,26,27,28,30,31,32,33,36

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
112 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
113 Res. units	476	305.8	123.8
garages	132	_____	_____
sheds	146	_____	_____
barns	1	_____	_____
115 Res. units	26	6.3	2.6
garages	_____	_____	_____
sheds	_____	_____	_____
Subtotal	781	312.1	126.4
<u>12 Commercial</u>			
121 Central Business Dist	_____	_____	_____
122 Shopping Center/Mall	_____	_____	_____
124 Neighborhood Business Dist	17	6.0	2.4
126 Institutional	1	0.7	0.3
Subtotal	18	6.7	2.7
<u>13 Industrial</u>			
138 Industrial Park	_____	_____	_____

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.2	0.1
143.2 Public Boat Landing		2.6	1.0
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		2.8	1.1

<u>17 Extractive</u>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		27.7	11.2
182 AG Agriculture Active		56.4	22.8
183 F Forest		393.8	159.5
184 H Heath		1.0	0.4
185 OW Open Water		26.2	10.6
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		160.3	64.9
Subtotal		665.4	269.4

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		6.9	2.8
193 Outdoor Recreation	4	292.8	118.6
194 Cemeteries			
Subtotal	4	299.7	121.4

Total Acres 1286.7  
Total Hectares 521.0

<u>Shoreline Modifications</u>		<u>Linear</u>	
		<u>Feet</u>	<u>Meters</u>
195 Sea Walls		10219.8	3115.8
196 Revetments		11487.6	3502.3
197 Groins		<u># of Groins</u>	<u>1</u>
198 Dock Non-Flow-Through		<u># of Docks</u>	<u>1</u>

Lake Michigan Coastal Development Inventory Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year:1967

County: Door County

Township, Village or City name: Township of Sevastopol (Bayside)

PLSS section data sheets included in summary (give full description):

T28 R25 Sec.12,13

T28 R26E Sec.6,7,18,19,30,31

LAND USE CATEGORIES

		Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	_____	118.6	48.0
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal		118.6	48.0
<u>12 Commercial</u>			
121 Central Business Dist	_____		
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____	10.9	4.4
126 Institutional	_____	1.7	0.7
Subtotal		12.6	5.1
<u>13 Industrial</u>			
138 Industrial Park	_____		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____	1.5	0.6
143.2 Public Boat Landing	_____		
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
Subtotal		1.5	0.6

17 Extractive

171 Open Pit	_____	47.0	19.0
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
Subtotal		47.0	19.0

18 Agricultural and Natural

181 AF Abandoned Field	_____	118.5	48.0
182 AG Agriculture Active	_____	223.9	90.7
183 F Forest	_____	393.1	159.2
184 H Heath	_____		
185 OW Open Water	_____	0.6	0.2
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____		
188 WT Wetland	_____	4.4	1.8
Subtotal		740.5	299.9

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	0.3	0.1
193 Outdoor Recreation	_____	8.5	3.4
194 Cemeteries	_____	10.1	4.1
Subtotal		18.9	7.6

Total Acres      939.1  
Total Hectares    380.2

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	2028.3	618.4
196 Revetments	_____	2060.5	628.2
197 Groins	_____	# of Groins	7
198 Dock Non-Flow-Through	_____	# of Docks	10

Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
County: Door County  
Township, Village or City name: Township of Sevastopol(Bay)  
PLSS section data sheets included in summary (give full description):

T28 R25 Sec. 12, 13  
T28 R26 Sec. 6,7,18,19,30,31

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units		
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	241.0	97.6
garages		
sheds		
barns		
115 Res. units		
garages		
sheds		
Subtotal	241.0	97.6
<u>12 Commercial</u>		
121 Central Business Dist		
122 Shopping Center/Mall		
124 Neighborhood Business Dist	14.7	6.0
126 Institutional		
Subtotal	14.7	6.0
<u>13 Industrial</u>		
138 Industrial Park		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____
142 Rail Transportation	_____	_____
143 Water Transportation	_____	_____
143.1 Private Marina	3.7	1.5
143.2 Public Boat Landing	1.5	0.6
144 Highways	_____	_____
145 Communications	_____	_____
146 Utilities	_____	_____
147 Sewage Treatment Plant	_____	_____
148 Landfill	_____	_____
Subtotal	5.2	2.1

17 Extractive

171 Open Pit	_____	_____
172 Underground	_____	_____
173 Well	_____	_____
179 Other Extractive	40.0	16.2
Subtotal	40.0	16.2

18 Agricultural and Natural

181 AF Abandoned Field	78.6	31.8
182 AG Agriculture Active	72.4	29.3
183 F Forest	376.8	152.6
184 H Heath	_____	_____
185 OW Open Water	0.3	0.1
186 RL Rock Ledge	_____	_____
187 SL Slump Zone	_____	_____
188 WT Wetland	1.0	0.4
Subtotal	_____	_____

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____
192 Urban Open Lots	7.2	2.9
193 Outdoor Recreation	13.6	5.5
194 Cemeteries	10.6	4.3
Subtotal	31.4	12.7

Total Acres      861.4  
Total Hectares    348.8

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	3909.6	1192.0
196 Revetments	_____	5054.6	1541.0
197 Groins	_____	# of Groins	5
198 Dock Non-Flow-Through	_____	# of Docks	_____



Door County Shoreland Assessment Project:  
1978 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992

County: Door County

Township, Village or City name: Township of Sevastopol(Bay)

PLSS section data sheets included in summary (give full description):

T28 R25 Sec. 12, 13

T28 R26 Sec. 6,7,18,19,30,31

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	8	12.4	5.0
garages			
sheds			
113 Res. units	292	266.6	108.0
garages	57		
sheds	87		
barns	4		
115 Res. units			
garages			
sheds			
Subtotal	448	279.0	113.0
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	2	2.4	1.0
126 Institutional			
Subtotal	2	2.4	1.0
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		2.5	1.0
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
	Subtotal	2.5	1.0

<u>17 Extractive</u>			
171 Open Pit		16.8	6.8
172 Underground			
173 Well			
179 Other Extractive		23.9	9.7
	Subtotal	40.7	16.5

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		23.5	9.5
182 AG Agriculture Active		55.8	22.6
183 F Forest		325.5	131.8
184 H Heath			
185 OW Open Water		0.5	0.2
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		0.4	0.2
	Subtotal	405.7	164.3

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		4.7	1.9
193 Outdoor Recreation		5.1	2.1
194 Cemeteries		10.2	4.1
	Subtotal	20.0	8.1

Total Acres 750.3  
Total Hectares 303.9

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	3122.0	951.8
196 Revetments	7446.2	2270.2
197 Groins	# of Groins	7
198 Dock Non-Flow-Through	# of Docks	6

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Township of Sevastopol (Lake)  
 PLSS section data sheets included in summary (give full description):

T28 R27 Sec. 2, 3, 9, 10, 16, 21, 22, 27, 28, 29, 31, 32, 33

LAND USE CATEGORIES

	Area	
	Acres	Hectares
<u>11 Residential</u>		
111 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
112 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
113 Res. units	54.4	22.0
garages	_____	_____
sheds	_____	_____
barns	_____	_____
115 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
Subtotal	54.4	22.0
<u>12 Commercial</u>		
121 Central Business Dist	_____	_____
122 Shopping Center/Mall	_____	_____
124 Neighborhood Business Dist	4.0	1.6
126 Institutional	_____	_____
Subtotal	4.0	1.6
<u>13 Industrial</u>		
138 Industrial Park	_____	_____

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____		
143.2 Public Boat Landing	_____	2.0	0.8
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
Subtotal		2.0	0.8

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field	_____	51.8	21.0
182 AG Agriculture Active	_____	0.8	0.3
183 F Forest	_____	701.6	284.1
184 H Heath	_____	25.0	10.1
185 OW Open Water	_____	1.6	0.6
186 RL Rock Ledge	_____	6.7	2.7
187 SL Slump Zone	_____		
188 WT Wetland	_____	14.1	5.7
Subtotal		801.6	324.5

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	0.1	0.04
193 Outdoor Recreation	_____	95.4	38.6
194 Cemeteries	_____		
Subtotal		95.5	38.6

Total Acres      957.5  
Total Hectares    387.5

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	200.0	61.0
196 Revetments	_____	85.1	25.9
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Sevastopol (Lake)  
 PLSS section data sheets included in summary (give full description):

T28 R27 Sec.2,3,9,10,16,21,22,27,28,29,31,32,33

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	223	135.6	54.9
garages	22		
sheds	25		
barns	1		
115 Res. units			
garages			
sheds			
Subtotal	271	135.6	54.9

12 Commercial

121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	8	6.4	2.6
126 Institutional		0.2	0.1
Subtotal	8	6.6	2.7

13 Industrial

138 Industrial Park			
---------------------	--	--	--

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing		0.7	0.3
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		0.7	0.3

**17 Extractive**

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

**18 Agricultural and Natural**

181 AF Abandoned Field		8.5	3.4
182 AG Agriculture Active			
183 F Forest		548.4	222.1
184 H Heath		40.8	16.5
185 OW Open Water		2.2	0.9
186 RL Rock Ledge		0.6	0.2
187 SL Slump Zone			
188 WT Wetland		20.5	8.3
Subtotal		621.0	251.4

**19 Open Land, Other**

191 Outdoor-Public Assembly			
192 Urban Open Lots		2.0	0.8
193 Outdoor Recreation	3	311.2	126.0
194 Cemeteries			
Subtotal	3	313.2	126.8

Total Acres 1077.1  
Total Hectares 436.1

**Shoreline Modifications**

		Linear	
		Feet	Meters
195 Sea Walls		409.2	124.8
196 Revetments		1122.6	342.3
197 Groins	# of Groins		
198 Dock Non-Flow-Through	# of Docks		1

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Sevastopol (Lake)  
 PLSS section data sheets included in summary (give full description):

T28 R27 Sec. 2, 3, 9, 10, 16, 21, 22, 27, 28, 29, 31, 32, 33

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	289	129.1	52.3
garages	33		
sheds	18		
barns			
115 Res. units			
garages			
sheds			
Subtotal	340	129.1	52.3
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	10	9.2	3.7
126 Institutional			
Subtotal	10	9.2	3.7
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		0.2	0.1
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		0.2	0.1

<u>17 Extractive</u>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		22.9	9.3
182 AG Agriculture Active			
183 F Forest		484.1	196.1
184 H Heath		11.1	4.5
185 OW Open Water		3.2	1.3
186 RL Rock Ledge		3.1	1.3
187 SL Slump Zone			
188 WT Wetland		20.0	8.1
Subtotal		544.4	220.6

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots	4	2.3	0.9
193 Outdoor Recreation	2	257.1	104.1
194 Cemeteries			
Subtotal	6	259.4	105.0

Total Acres 942.3  
Total Hectares 381.7

		Linear	
		Feet	Meters
<u>Shoreline Modifications</u>			
195 Sea Walls		2328.4	709.9
196 Revetments		1331.4	405.9
197 Groins	# of Groins		
198 Dock Non-Flow-Through	# of Docks		2



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
County: Door County  
Township, Village or City name: Village of Sister Bay  
PLSS section data sheets included in summary (give full description):

T31 R28 Sec. 5,6,7

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units		
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	67.0	27.1
garages		
sheds		
barns		
115 Res. units		
garages		
sheds		
Subtotal	67.0	27.1
<u>12 Commercial</u>		
121 Central Business Dist	11.6	4.7
122 Shopping Center/Mall		
124 Neighborhood Business Dist	1.4	0.6
126 Institutional		
Subtotal	13.0	5.3
<u>13 Industrial</u>		
138 Industrial Park	10.1	4.1

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____	_____	_____
142 Rail Transportation	_____	_____	_____
143 Water Transportation	_____	_____	_____
143.1 Private Marina	_____	1.0	0.4
143.2 Public Boat Landing	_____	0.3	0.1
144 Highways	_____	_____	_____
145 Communications	_____	_____	_____
146 Utilities	_____	_____	_____
147 Sewage Treatment Plant	_____	_____	_____
148 Landfill	_____	_____	_____
Subtotal	_____	1.3	0.5

17 Extractive

171 Open Pit	_____	_____	_____
172 Underground	_____	_____	_____
173 Well	_____	_____	_____
179 Other Extractive	_____	_____	_____
Subtotal	_____	_____	_____

18 Agricultural and Natural

181 AF Abandoned Field	_____	21.2	8.6
182 AG Agriculture Active	_____	12.6	5.1
183 F Forest	_____	159.1	64.4
184 H Heath	_____	_____	_____
185 OW Open Water	_____	_____	_____
186 RL Rock Ledge	_____	_____	_____
187 SL Slump Zone	_____	_____	_____
188 WT Wetland	_____	27.4	11.1
Subtotal	_____	220.3	89.2

19 Open Land, Other

191 Outdoor-Public Assembly	_____	_____	_____
192 Urban Open Lots	_____	_____	_____
193 Outdoor Recreation	_____	15.7	6.4
194 Cemeteries	_____	_____	_____
Subtotal	_____	15.7	6.4

Total Acres      327.4  
Total Hectares    132.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	2811.6	857.2
196 Revetments	_____	572.9	174.7
197 Groins	_____	# of Groins	1
198 Dock Non-Flow-Through	_____	# of Docks	5

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Village of Sister Bay  
 PLSS section data sheets included in summary (give full description):

T31 R28 Sec. 5,6,7

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	149	97.4	39.4
garages	40		
sheds	36		
barns			
115 Res. units			
garages			
sheds			
Subtotal	225	97.4	39.4
<u>12 Commercial</u>			
121 Central Business Dist	45	14.9	6.0
122 Shopping Center/Mall			
124 Neighborhood Business Dist		1.4	0.6
126 Institutional			
Subtotal	45	16.3	6.6
<u>13 Industrial</u>			
138 Industrial Park	10	6.1	2.5

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	1.5	0.6
143.2 Public Boat Landing	2	2.0	0.8
144 Highways		2.7	1.1
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	3	6.2	2.5

**17 Extractive**

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

**18 Agricultural and Natural**

181 AF Abandoned Field		21.0	8.5
182 AG Agriculture Active		5.5	2.2
183 F Forest		121.8	49.3
184 H Heath			
185 OW Open Water		2.1	0.9
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		29.4	11.9
Subtotal		179.8	72.8

**19 Open Land, Other**

191 Outdoor-Public Assembly			
192 Urban Open Lots	1	2.2	0.9
193 Outdoor Recreation	1	15.2	6.2
194 Cemeteries			
Subtotal	2	17.4	7.1

Uninterpreted acres 8.7

Total Acres 333.6  
Total Hectares 135.1

**Shoreline Modifications**

	Linear	
	Feet	Meters
195 Sea Walls	3535.8	1078.0
196 Revetments	1476.4	450.1
197 Groins	# of Groins	
198 Dock Non-Flow-Through	# of Docks	4

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Village of Sister Bay  
 PLSS section data sheets included in summary (give full description):

T31 R28 Sec. 5,6,7

LAND USE CATEGORIES

	# of structures	Area	
		Acres	Hectares
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units	36	32.1	13.0
garages	2		
sheds			
113 Res. units	185	108.9	44.1
garages	30		
sheds	30		
barns	1		
115 Res. units			
garages			
sheds			
Subtotal	284	141.0	57.1
<u>12 Commercial</u>			
121 Central Business Dist	52	28.6	11.6
122 Shopping Center/Mall			
124 Neighborhood Business Dist	15	3.8	1.5
126 Institutional			
Subtotal	67	32.4	13.1
<u>13 Industrial</u>			
138 Industrial Park			

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	3.0	1.2
143.2 Public Boat Landing		4.1	1.7
144 Highways		2.7	1.1
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	1	9.8	4.0

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		2.3	0.9
182 AG Agriculture Active		0.7	0.3
183 F Forest		101.0	40.9
184 H Heath			
185 OW Open Water		0.8	0.3
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		6.8	2.8
Subtotal		111.6	45.2

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		3.4	1.4
193 Outdoor Recreation		13.6	5.5
194 Cemeteries			
Subtotal		17.0	6.9

Total Acres 311.8  
Total Hectares 126.3

Shoreline Modifications

	<u>Linear</u>	
	<u>Feet</u>	<u>Meters</u>
195 Sea Walls	4221.0	1286.9
196 Revetments	1557.2	474.8
197 Groins	# of Groins	
198 Dock Non-Flow-Through	# of Docks	23

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
County: Door County  
Township, Village or City name: City of Sturgeon Bay  
PLSS section data sheets included in summary (give full description):

T26 R26 Sec.31

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units		
garages		
sheds		
112 Res. units		
garages		
sheds		
113 Res. units	5.8	2.3
garages		
sheds		
barns		
115 Res. units		
garages		
sheds		
Subtotal	5.8	2.3
<u>12 Commercial</u>		
121 Central Business Dist		
122 Shopping Center/Mall		
124 Neighborhood Business Dist		
126 Institutional		
Subtotal		
<u>13 Industrial</u>		
138 Industrial Park		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation \_\_\_\_\_  
 142 Rail Transportation \_\_\_\_\_  
 143 Water Transportation \_\_\_\_\_  
 143.1 Private Marina \_\_\_\_\_  
 143.2 Public Boat Landing \_\_\_\_\_  
 144 Highways \_\_\_\_\_  
 145 Communications \_\_\_\_\_  
 146 Utilities \_\_\_\_\_  
 147 Sewage Treatment Plant \_\_\_\_\_  
 148 Landfill \_\_\_\_\_  
 Subtotal \_\_\_\_\_

17 Extractive

171 Open Pit \_\_\_\_\_  
 172 Underground \_\_\_\_\_  
 173 Well \_\_\_\_\_  
 179 Other Extractive \_\_\_\_\_  
 Subtotal \_\_\_\_\_

18 Agricultural and Natural

181 AF Abandoned Field _____	0.5	0.2
182 AG Agriculture Active _____		
183 F Forest _____	1.2	0.5
184 H Heath _____		
185 OW Open Water _____	1.6	0.6
186 RL Rock Ledge _____		
187 SL Slump Zone _____		
188 WT Wetland _____	1.4	0.6
Subtotal	4.7	1.9

19 Open Land, Other

191 Outdoor-Public Assembly \_\_\_\_\_  
 192 Urban Open Lots \_\_\_\_\_  
 193 Outdoor Recreation \_\_\_\_\_  
 194 Cemeteries \_\_\_\_\_  
 Subtotal \_\_\_\_\_

Total Acres      10.5  
 Total Hectares      4.2

Shoreline Modifications

	Linear	
	Feet	Meters
195 Sea Walls _____		
196 Revetments _____		
197 Groins _____	# of Groins	
198 Dock Non-Flow-Through _____	# of Docks	



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978

County: Door County

Township, Village or City name: City of Sturgeon Bay

PLSS section data sheets included in summary (give full description):

T26 R26 Sec.31

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	13	6.4	2.6
garages	1		
sheds	2		
barns			
115 Res. units			
garages			
sheds			
Subtotal	16	6.4	2.6

12 Commercial

121 Central Business Dist \_\_\_\_\_

122 Shopping Center/Mall \_\_\_\_\_

124 Neighborhood Business Dist \_\_\_\_\_

126 Institutional \_\_\_\_\_

Subtotal

13 Industrial

138 Industrial Park \_\_\_\_\_

	# of structures	Area	
		Acres	Hectares
<b>14 Transportation</b>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		1.4	0.6
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		1.4	0.6

**17 Extractive**

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

**18 Agricultural and Natural**

181 AF Abandoned Field			
182 AG Agriculture Active			
183 F Forest		0.4	0.2
184 H Heath			
185 OW Open Water			
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland			
Subtotal		0.4	0.2

**19 Open Land, Other**

191 Outdoor-Public Assembly			
192 Urban Open Lots			
193 Outdoor Recreation			
194 Cemeteries		1.0	0.4
Subtotal		1.0	0.4

Total Acres 9.2  
Total Hectares 3.8

**Shoreline Modifications**

	Linear	
	Feet	Meters
195 Sea Walls	95.4	29.1
196 Revetments		
197 Groins	# of Groins	1
198 Dock Non-Flow-Through	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: City of Sturgeon Bay  
 PLSS section data sheets included in summary (give full description):

T28 R26 Sec.31  
 T27 R26 Sec.22,23

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
112 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
113 Res. units	13	8.9	3.6
garages	1	_____	_____
sheds	4	_____	_____
barns	_____	_____	_____
115 Res. units	_____	_____	_____
garages	_____	_____	_____
sheds	_____	_____	_____
Subtotal	18	8.9	3.6

12 Commercial

121 Central Business Dist	_____
122 Shopping Center/Mall	_____
124 Neighborhood Business Dist	_____
126 Institutional	_____
Subtotal	_____

13 Industrial

138 Industrial Park	_____
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	# of structures	Area	
		Acres	Hectares

14 Transportation

141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina		1.5	0.6
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		1.5	0.6

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		0.9	0.4
182 AG Agriculture Active			
183 F Forest		24.0	9.7
184 H Heath		5.2	2.1
185 OW Open Water			
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland			
Subtotal		30.1	12.2

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots			
193 Outdoor Recreation		0.3	0.1
194 Cemeteries			
Subtotal		0.3	0.1

28.7 acres were annexed from the Township of Sturegon Bay

Total Acres	40.8
Total Hectares	16.5

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls			
196 Revetments		221.8	67.6
197 Groins		# of Groins	2
198 Dock Non-Flow-Through		# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
 County: Door County  
 Township, Village or City name: Township of Sturgeon Bay  
 PLSS section data sheets included in summary (give full description):

T27 R26 Sec.1,12,13,14,22,23,27,34  
 T27 R27 Sec.6

LAND USE CATEGORIES

		Area	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units	_____		
garages	_____		
sheds	_____		
112 Res. units	_____		
garages	_____		
sheds	_____		
113 Res. units	_____	47.2	19.1
garages	_____		
sheds	_____		
barns	_____		
115 Res. units	_____		
garages	_____		
sheds	_____		
Subtotal		47.2	19.1
<u>12 Commercial</u>			
121 Central Business Dist	_____		
122 Shopping Center/Mall	_____		
124 Neighborhood Business Dist	_____		
126 Institutional	_____	3.2	1.3
Subtotal		3.2	1.3
<u>13 Industrial</u>			
138 Industrial Park	_____		

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____		
143.2 Public Boat Landing	_____	0.4	0.2
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
Subtotal		0.4	0.2

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field	_____	54.2	22.0
182 AG Agriculture Active	_____	3.9	1.6
183 F Forest	_____	651.0	263.7
184 H Heath	_____	26.3	10.7
185 OW Open Water	_____	4.0	1.6
186 RL Rock Ledge	_____	0.2	0.1
187 SL Slump Zone	_____		
188 WT Wetland	_____	32.0	13.0
Subtotal		771.6	312.7

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____		
193 Outdoor Recreation	_____		
194 Cemeteries	_____		
Subtotal			

Total Acres      822.4  
Total Hectares    333.1

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	309.5	94.4
196 Revetments	_____	450.8	137.4
197 Groins	_____	# of Groins	2
198 Dock Non-Flow-Through	_____	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Sturgeon Bay  
 PLSS section data sheets included in summary (give full description):

T27 R26 Sec.1,12,13,14,22,23,27,34  
 T27 R27 Sec.6

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	201	130.5	52.9
garages	53		
sheds	48		
barns			
115 Res. units			
garages			
sheds			
<b>Subtotal</b>	<b>302</b>	<b>130.5</b>	<b>52.9</b>

12 Commercial

121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist			
126 Institutional	9	8.8	3.6
<b>Subtotal</b>	<b>9</b>		

13 Industrial

138 Industrial Park			
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	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
		Subtotal	

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
		Subtotal	

18 Agricultural and Natural

181 AF Abandoned Field		18.8	7.6
182 AG Agriculture Active		2.6	1.0
183 F Forest		530.6	214.9
184 H Heath		16.7	6.8
185 OW Open Water		4.6	1.9
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		56.1	22.7
		Subtotal	629.4 254.9

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		2.1	0.9
193 Outdoor Recreation	1	26.3	10.7
194 Cemeteries			
		Subtotal	1 28.4 11.6

Total Acres 797.1  
Total Hectares 323.0

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls		1907.6	581.6
196 Revetments		1374.0	418.9
197 Groins	# of Groins		2
198 Dock Non-Flow-Through	# of Docks		



Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Sturgeon Bay  
 PLSS section data sheets included in summary (give full description):

T27 R26 Sec.1,12,13,14,22,23,27,34  
 T27 R27 Sec.6

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	244	136.9	55.4
garages	54		
sheds	57		
barns			
115 Res. units			
garages			
sheds			
Subtotal	355	136.9	55.4
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist			
126 Institutional	12	6.9	2.8
Subtotal	12	6.9	2.8
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing		0.3	0.1
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		0.3	0.1

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		9.3	3.8
182 AG Agriculture Active			
183 F Forest		426.2	172.6
184 H Heath		2.3	0.9
185 OW Open Water		4.2	1.7
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		158.1	64.0
Subtotal		600.1	243.0

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		0.7	0.3
193 Outdoor Recreation		13.7	5.5
194 Cemeteries			
Subtotal		14.4	5.8

19.2 acres and 9.5 acres of Sec 22 and 23 respectively has been annexed by the City of Sturgeon Bay

Shoreline Modifications

	Linear	
	Feet	Meters
195 Sea Walls	3649.6	1112.7
196 Revetments	5906.0	1800.6
197 Groins	# of Groins	1
198 Dock Non-Flow-Through	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1967  
County: Door County  
Township, Village or City name: Township of Union  
PLSS section data sheets included in summary (give full description):

T26 R23 Sec.2,3,9,10,16,21,28,32,33

LAND USE CATEGORIES

	Area	
	<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>		
111 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
112 Res. units	_____	_____
garages	_____	_____
sheds	_____	_____
113 Res. units	103.2	41.8
garages	_____	_____
sheds	_____	_____
barns	_____	_____
115 Res. units	7.6	3.1
garages	_____	_____
sheds	_____	_____
Subtotal	110.8	44.9
<u>12 Commercial</u>		
121 Central Business Dist	_____	_____
122 Shopping Center/Mall	_____	_____
124 Neighborhood Business Dist	_____	_____
126 Institutional	_____	_____
Subtotal	_____	_____
<u>13 Industrial</u>		
138 Industrial Park	_____	_____

Area  
Acres      Hectares

14 Transportation

141 Air Transportation	_____		
142 Rail Transportation	_____		
143 Water Transportation	_____		
143.1 Private Marina	_____	1.2	0.5
143.2 Public Boat Landing	_____		
144 Highways	_____		
145 Communications	_____		
146 Utilities	_____		
147 Sewage Treatment Plant	_____		
148 Landfill	_____		
	Subtotal	1.2	0.5

17 Extractive

171 Open Pit	_____		
172 Underground	_____		
173 Well	_____		
179 Other Extractive	_____		
	Subtotal		

18 Agricultural and Natural

181 AF Abandoned Field	_____	138.6	56.1
182 AG Agriculture Active	_____	230.6	93.4
183 F Forest	_____	296.0	119.9
184 H Heath	_____		
185 OW Open Water	_____	0.1	0.04
186 RL Rock Ledge	_____		
187 SL Slump Zone	_____		
188 WT Wetland	_____	30.2	12.2
	Subtotal	695.5	281.6

19 Open Land, Other

191 Outdoor-Public Assembly	_____		
192 Urban Open Lots	_____	1.5	0.6
193 Outdoor Recreation	_____	9.9	4.0
194 Cemeteries	_____		
	Subtotal	11.4	4.6

Uninterpreted acres	Total Acres	818.9
	Total Hectares	331.6

Shoreline Modifications

		Linear	
		Feet	Meters
195 Sea Walls	_____	1481.7	451.7
196 Revetments	_____	335.9	102.4
197 Groins	_____	# of Groins	
198 Dock Non-Flow-Through	_____	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1978  
 County: Door County  
 Township, Village or City name: Township of Union  
 PLSS section data sheets included in summary (give full description):

T26 R23 Sec.2,3,9,10,16,21,28,32,33

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	225	131.2	53.1
garages	53		
sheds	119		
barns	2		
115 Res. units	109	17.2	7.0
garages			
sheds			
Subtotal	508	148.4	60.1

12 Commercial

121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist			
126 Institutional			
Subtotal			

13 Industrial

138 Industrial Park			
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	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina	1	1.6	0.6
143.2 Public Boat Landing			
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal	1	1.6	0.6

17 Extractive

171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

18 Agricultural and Natural

181 AF Abandoned Field		29.5	11.9
182 AG Agriculture Active		246.2	99.7
183 F Forest		277.6	112.4
184 H Heath			
185 OW Open Water		1.9	0.8
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		51.9	21.0
Subtotal		607.1	245.8

19 Open Land, Other

191 Outdoor-Public Assembly			
192 Urban Open Lots		9.2	3.7
193 Outdoor Recreation		1.0	0.4
194 Cemeteries			
Subtotal		10.2	4.1

Uninterpreted acres

Total Acres 767.3  
Total Hectares 310.6

Shoreline Modifications

	Linear	
	Feet	Meters
195 Sea Walls	7745	2361.3
196 Revetments	3410	1039.6
197 Groins	# of Groins	
198 Dock Non-Flow-Through	# of Docks	

Door County Shoreland Assessment Project:  
1967 - 1992

Civil Jurisdiction  
Summary Data Sheet

Year: 1992  
 County: Door County  
 Township, Village or City name: Township of Union  
 PLSS section data sheets included in summary (give full description):

T26 R23 Sec.2,3,9,10,16,21,28,32,33

LAND USE CATEGORIES

	<u># of structures</u>	<u>Area</u>	
		<u>Acres</u>	<u>Hectares</u>
<u>11 Residential</u>			
111 Res. units			
garages			
sheds			
112 Res. units			
garages			
sheds			
113 Res. units	267	147.3	59.7
garages	83		
sheds	134		
barns	4		
115 Res. units	86	15.3	6.2
garages			
sheds			
Subtotal	574	162.6	65.9
<u>12 Commercial</u>			
121 Central Business Dist			
122 Shopping Center/Mall			
124 Neighborhood Business Dist	1	0.7	0.3
126 Institutional			
Subtotal	1	0.7	0.3
<u>13 Industrial</u>			
138 Industrial Park			

	# of structures	Area	
		Acres	Hectares
<u>14 Transportation</u>			
141 Air Transportation			
142 Rail Transportation			
143 Water Transportation			
143.1 Private Marina			
143.2 Public Boat Landing		4.0	1.62
144 Highways			
145 Communications			
146 Utilities			
147 Sewage Treatment Plant			
148 Landfill			
Subtotal		4.0	1.62

<u>17 Extractive</u>			
171 Open Pit			
172 Underground			
173 Well			
179 Other Extractive			
Subtotal			

<u>18 Agricultural and Natural</u>			
181 AF Abandoned Field		78.7	31.9
182 AG Agriculture Active		176.0	71.3
183 F Forest		300.1	121.5
184 H Heath		0.5	0.2
185 OW Open Water		1.2	0.5
186 RL Rock Ledge			
187 SL Slump Zone			
188 WT Wetland		32.7	13.2
Subtotal		589.2	238.6

<u>19 Open Land, Other</u>			
191 Outdoor-Public Assembly			
192 Urban Open Lots		1.6	0.6
193 Outdoor Recreation		2.3	0.9
194 Cemeteries			
Subtotal		3.9	1.5

Uninterpreted acres	Total Acres	760.4
	Total Hectares	307.9

		Linear	
		Feet	Meters
195 Sea Walls		9446.8	2880.1
196 Revetments		6552.0	1997.6
197 Groins	# of Groins		
198 Dock Non-Flow-Through	# of Docks		





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