CASE STUDIES

Michigan Coastal Community Working Waterfronts

# WATERFRONT LAND USE

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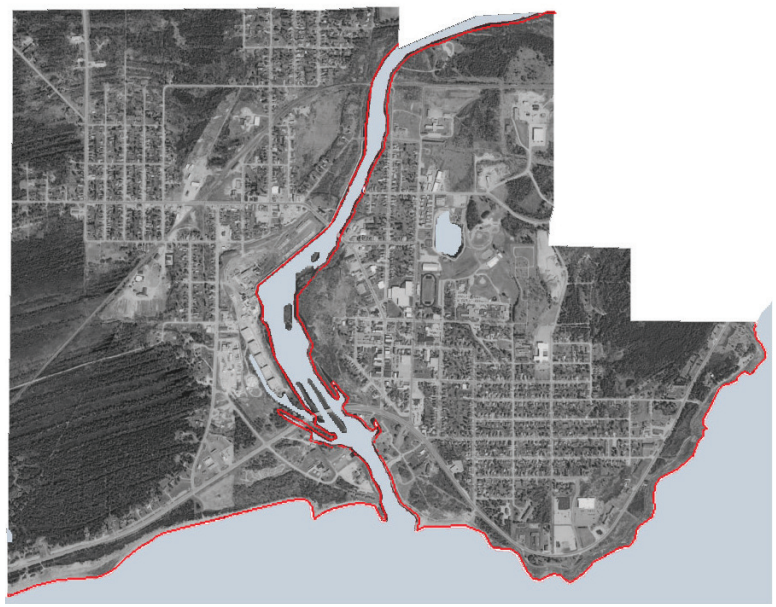
# LAND USE ANALYSIS

## AREAS OF INTEREST

Two areas of interest were identified for the case study analysis: frontage on Great Lakes, inland lakes and rivers, and land use within a coastal zone of influence of these bodies of water. Frontage on the Great Lakes, inland lakes and rivers consists of the land use immediately adjacent to these bodies of water. Land use within a coastal zone of influence is based off Michigan's CZM boundary, which extends generally 1000 feet from the mean high water mark and up harbors and river mouths. Due to the variation in the extent of the CZM boundary, a 1000-foot buffer from the Great Lakes, connected inland lakes and rivers was used to standardize the analysis of land use within a coastal zone. Figure 1 displays and example of each area of interest in Manistique, Mich.



Frontage along Lake Michigan and the Manistique River in Manistique, Mich.

1000-foot Buffer from Lake Michigan and the Manistique River in Manistique, Mich.

FIGURE 1. AREAS OF INTEREST IN MANISTIQUE, MI: FRONTAGE ALONG THE GREAT LAKES, CONNECTED INLAND LAKES AND RIVER MOUTHS (LEFT) AND AREA WITHIN A 1000-FOOT BUFFER OF GREAT LAKES, CONNECTED INLAND LAKES AND RIVER MOUTHS (RIGHT).

## ZONING AND LAND USE ANALYSIS

Five general land use categories were created to enable comparison across case study communities. These categories include:

- residential
- commercial
- industrial
- mixed use
- open space and other

The waterfront zoning graphs in each case study report display the percent of waterfront frontage and percent of the area within a 1000-foot buffer by these generalized zoning categories. Figures 2 and 3 display the frontage and area within this buffer in 10 of the case study communities by generalized zoning category. The zoning districts represented by each generalized zoning category are listed above each land use bar within the individual case study reports.

## PARCEL CLASSIFICATION AND ANALYSIS

To gain a general understanding of what portion of the waterfront and area within 1000 feet of the waterfront was occupied by water-related uses and the location of these uses, individual parcels were classified in communities that provided a parcel shapefile. Parcels were classified into five categories: public access, water-dependent use, water-dependent use-industry, water-dependent use-utility, water-enhanced use and non-water-dependent use. The use of each parcel was identified using a combination of resources including municipal parcel shapefiles and data, zoning shapefiles, a Google search, Google Maps, site visits and ground truthing. The table below provides examples of how various uses were classified for the purpose of assessing land use in this case study analysis.

| | |
|---|---|
| Public Access | beach, waterfront park, boat launch at park |
| Water-Dependent-Use | public or private marina, boat launch, fish cleaning station, bait and supply shop, marine service, supply, repair and storage, yacht club, light house, coast guard station, marine-related research or educational facility |
| Water-Dependent Use-Industry | manufacturing facility, industrial dock/port, paper plant, cement plant |
| Water-Dependent Use-Utility | water treatment plant, power plant |
| Water-Enhanced Use | hotel, motel, inn, restaurant |
| Non-Water-Dependent Use | residence, office, retail |

TABLE 1. EXAMPLES OF PARCEL USE CLASSIFIED BY WATER-RELATED USE.

# WATERFRONT LAND USE SUMMARY

Land use along the waterfront was variable across case study communities. Residential (25%) and open space uses (21%) accounted for the greatest percent of the average waterfront land use in case study communities.* Marquette and Muskegon had the greatest percent open space along the waterfront, while Monroe had the greatest percent industrial use. Residential uses along the waterfront accounted for the least percent of total frontage in Monroe and Muskegon (Figure 2). Land use within the buffer also varied by community: industrial uses ranged from less than 1 percent in Charlevoix to 58 percent in Monroe; open space zoning ranged from 0 percent in Port Huron and Ontonagon to 40 percent in Muskegon; and commercial uses ranged from 0 percent in Ontonagon to 28 percent in Port Huron. Residential uses accounted for an average of 38 percent of the land within the buffer (Figure 3).

**LAND USE ALONG THE WATERFRONT (PERCENT OF TOTAL FRONTAGE)**

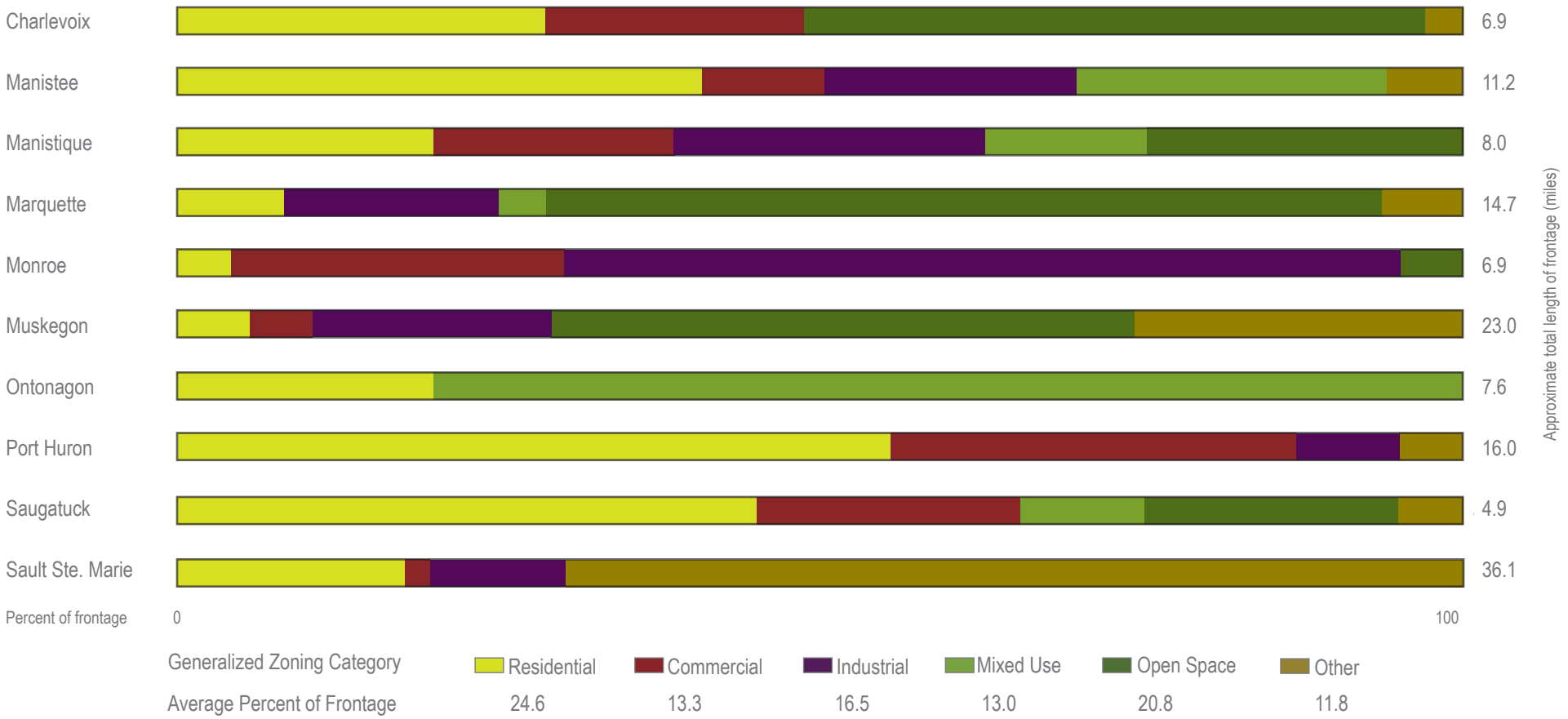



FIGURE 2. WATERFRONT LAND USE AS A PERCENT OF TOTAL FRONTAGE LENGTH IN 10 CASE STUDY COMMUNITIES.

**10 of the 11 case study communities were used to compile this information. Alpena was not included.*

## LAND USE WITHIN A 1000-FOOT BUFFER OF THE WATERFRONT (PERCENT OF TOTAL AREA)*

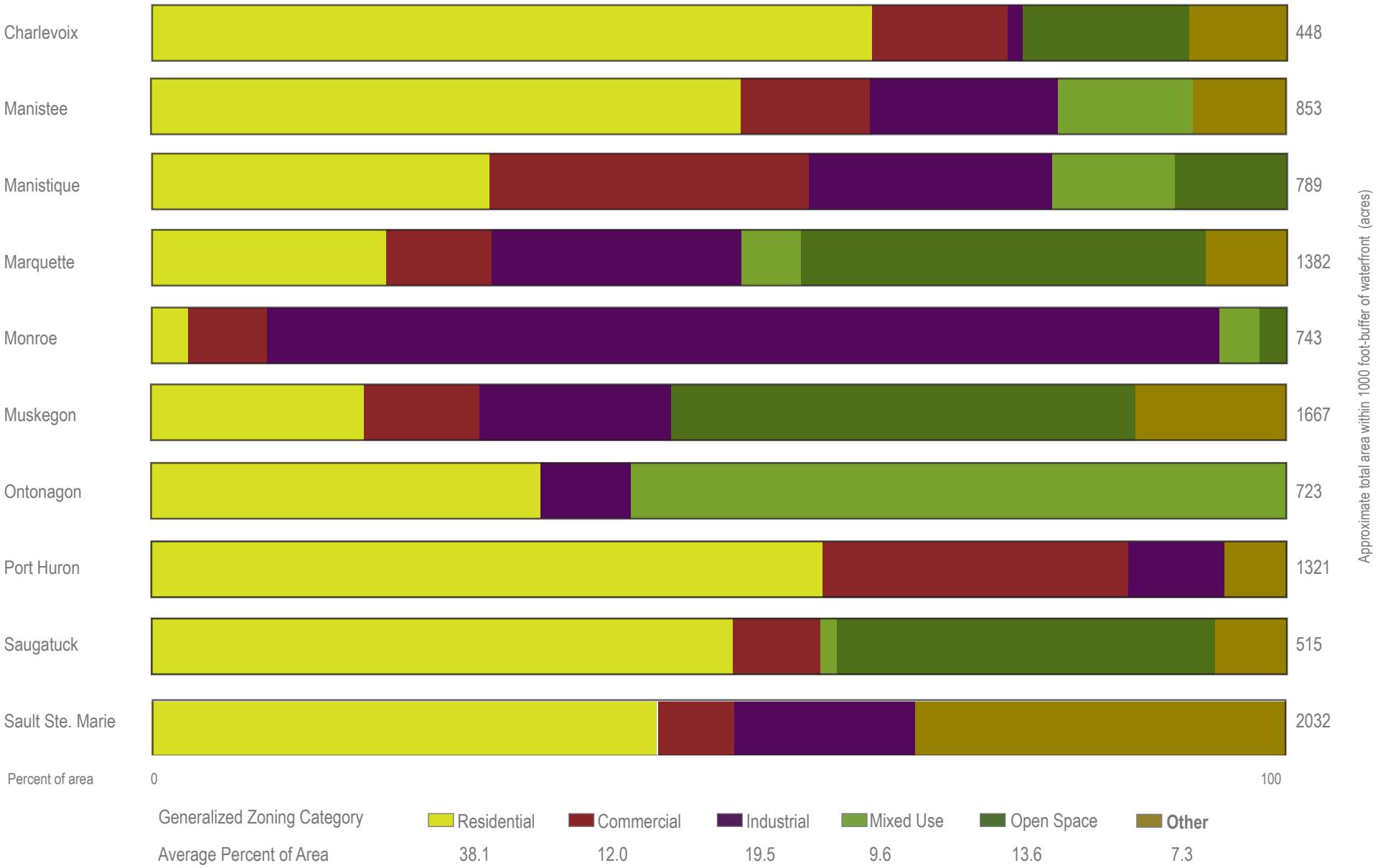



FIGURE 3. LAND USE AS A PERCENT OF TOTAL AREA WITHIN 1000 FEET OF WATER BODIES IN 10 CASE STUDY COMMUNITIES.

**10 of the 11 case study communities were used to compile this information. Alpena was not included.*

# PARCEL CLASSIFICATION SUMMARY

Parcel use also varied across case study communities (Figure 4). Public access and water-dependent uses accounted for an average of approximately 21 and 13 percent, respectively, of the frontage along bodies of water in the seven case study communities for which data was available. Water-enhanced uses, including hotels and restaurants, accounted for a low percent of the total waterfront use. Charlevoix, Port Huron and Saugatuck had the greatest percent of non-water-dependent uses along the waterfront. Water-related uses including public access, water-dependent uses, water-dependent use-industry, water-dependent use-utility and water enhanced uses accounted for a total of approximately 9 to 55 percent of the area of parcels within the buffer (Figure 5). Non-water-dependent uses accounted for an average of 69 percent of the land use within the buffer.

**PARCEL USE ALONG THE WATERFRONT (PERCENT OF TOTAL FRONTAGE)**

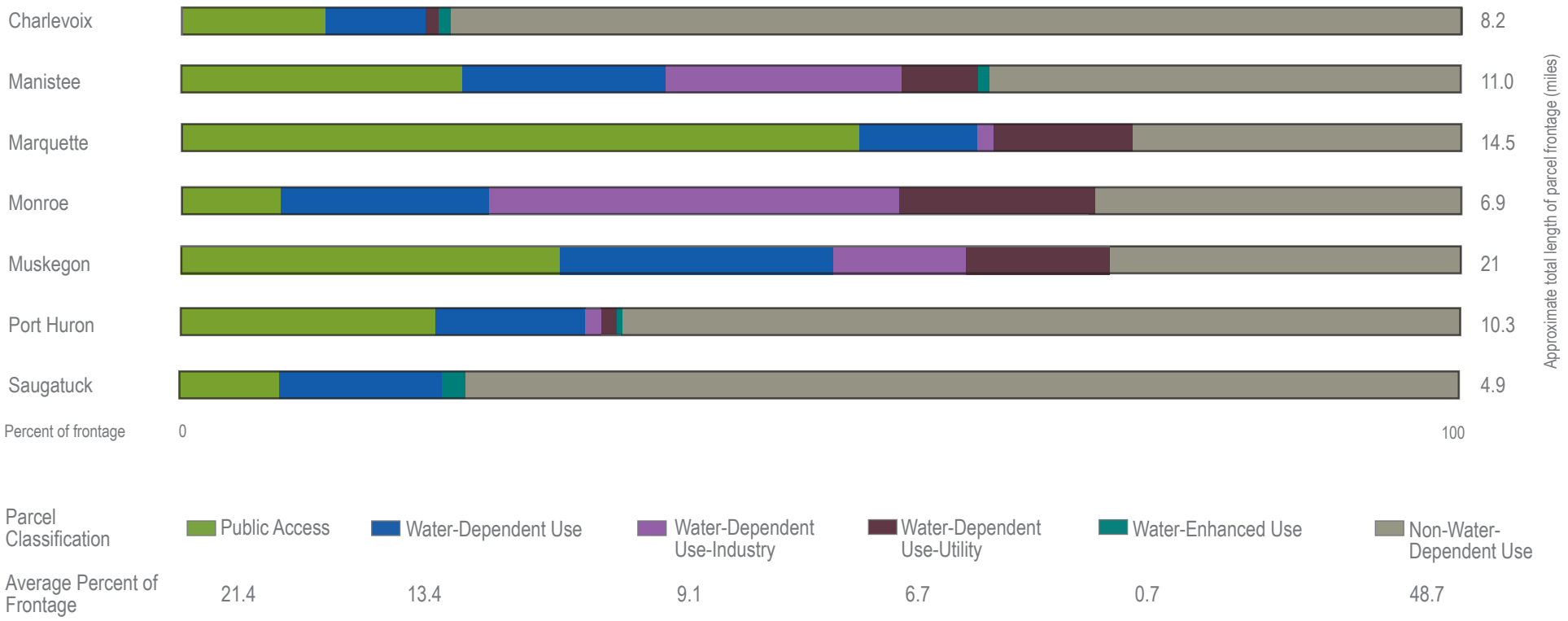



FIGURE 4. WATERFRONT PARCEL USE AS A PERCENTAGE OF TOTAL FRONTAGE LENGTH IN SEVEN CASE STUDY COMMUNITIES.

**PARCEL USE WITHIN A 1000-FOOT BUFFER OF THE WATERFRONT (PERCENT OF TOTAL AREA)**

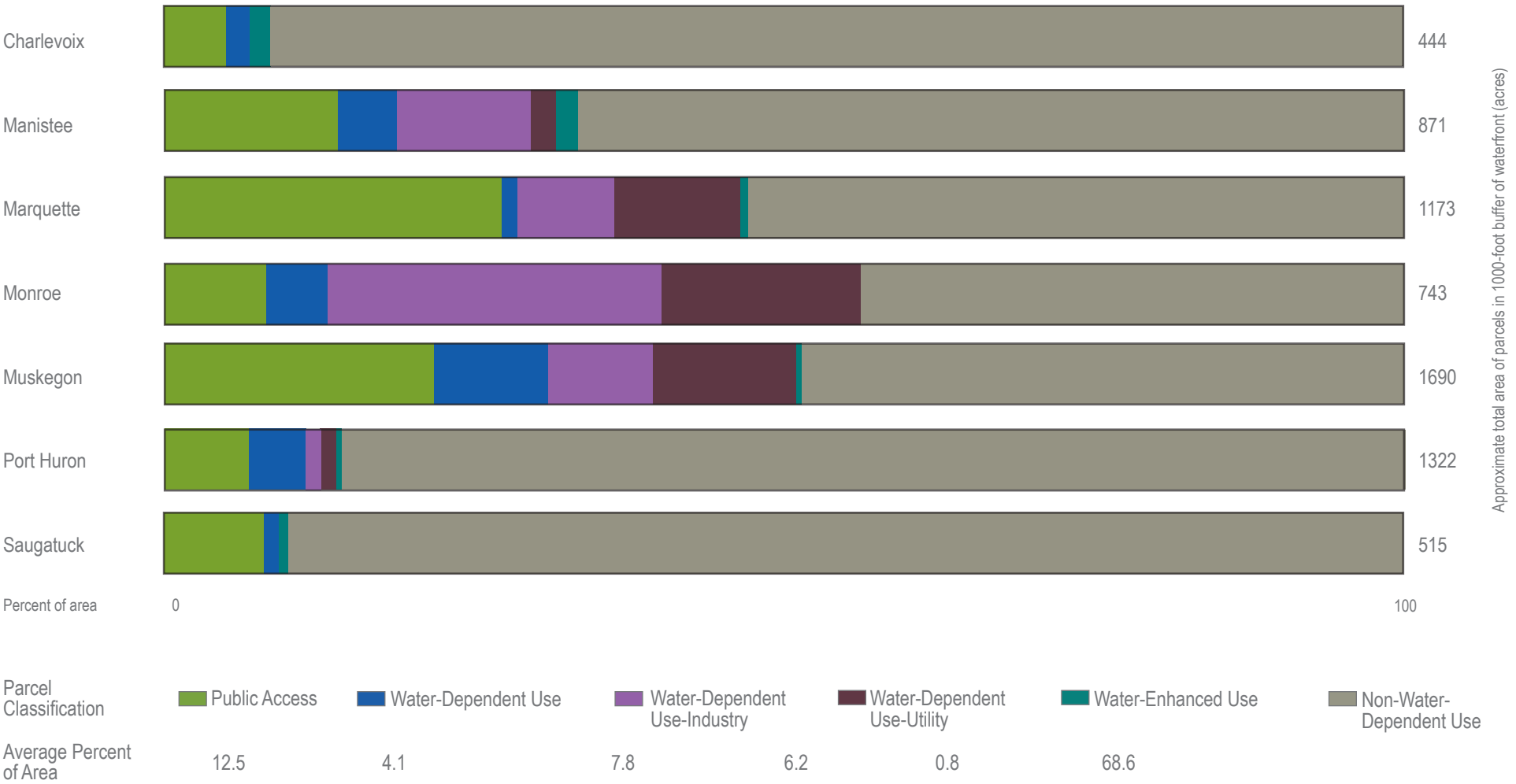



FIGURE 5. PARCEL USE AS A PERCENT OF TOTAL AREA WITHIN 1000 FEET OF WATER BODIES IN SEVEN CASE STUDY COMMUNITIES.