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Land Ownership in Door County

Introduction

Sometimes referred to as the Cape Cod of the Midwest (Marcus, 2021), Door County, Wisconsin is a popular area for second homes and vacation properties due to its 300 mile shoreline along Lake Michigan and the bay of Green Bay. Because of the idyllic nature of the geography, the county draws visitors and landowners from all over the country. Locally there is an assumption that much of Northern Wisconsin is 'owned by Illinois' rather than by local Wisconsin residents. Inspired by UW Eau Claire Professor Ryan Weichert's study on who owns the Northwoods of Wisconsin, this project aims to understand land ownership in Door County. Using the State Cartographer's Office's Statewide Parcel Database, we use attribute values of each parcel to look at the spatial distribution of Door County landowners and to look at more general parcel qualities.

Our main research questions are:

- Where do Door County landowners actually live?
- How much of Door County is locally owned?
- What can parcel attributes reveal about land ownership?

We use the statewide parcel layer, a point layer of geocoded owner mailing addresses, and US states, Wisconsin counties, and Door County municipality shapefiles to answer these questions. Using Postgresql/PostGIS and ArcGIS Pro, we query and visualize our layers.

Conceptualization

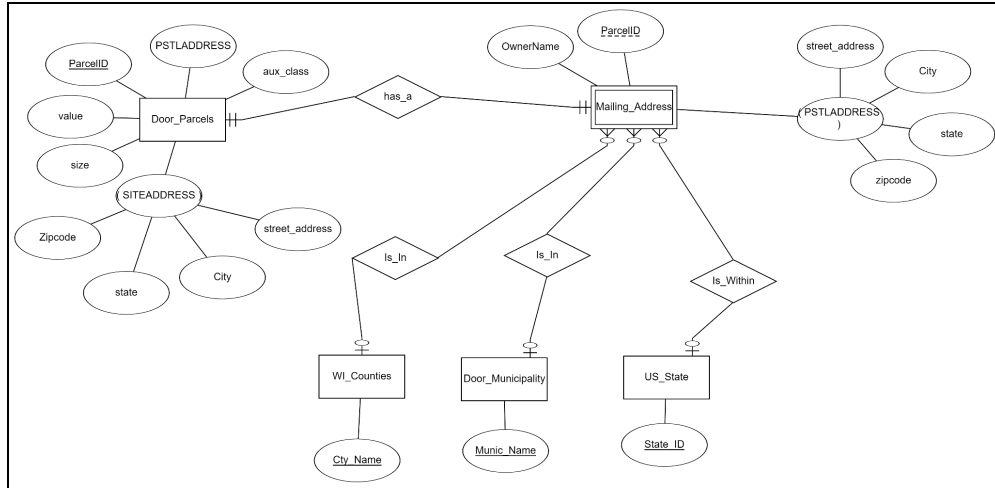


Figure 1: Entity-Relationship Diagram

The two main entities in our conceptual model are the Door County parcel polygon layer and the geocoded point layer of owner mailing addresses. Our supporting layers are US states, Wisconsin counties and Door County municipalities. We have these as separate entities so that we can perform spatial queries on them with Postgis. Each parcel has a single owner mailing address as well as an 'aux_class' (auxiliary class) which indicates if the parcel is publicly owned. One owner can own many parcels but in our study, each geocoded point represents one parcel. We separated the 'siteaddress' and 'pstladdress' (postal address; we refer to this attribute throughout this paper as 'mailing address') into composite attributes, street, city, state, and zip code in order to perform different types of queries with sections of the full address. Although there is at least one owner point in every US state, in most counties in Wisconsin, and in all municipalities in Door County, the 'is in' relationship for these layers is optional.

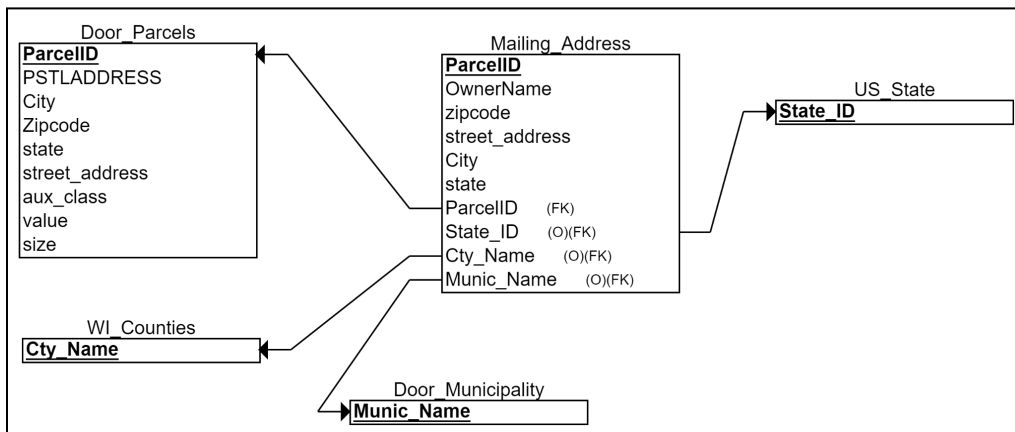


Figure 2: Relational Schema

Each parcel has a unique 'parcelid', and each mailing address includes the parcel id as a joined attribute. The parcels have two important attributes: 'siteaddress', which is the address of the physical location of the parcel within Door County, and 'pstladdress' which is the mailing address of the parcel's owner. Using this 'pstladdress' attribute, we parsed each address in Excel and geolocated them in ArcGIS Pro to create a point layer showing where the landowners live. We can assume that the mailing address of the owner is their primary residence because that address is the one owners provide to have their tax documents sent to (Weichelt, Zeitler, 2021). Each point on the geocoded point layer represents one parcel. Although there are owners who own multiple parcels, each parcel in the parcel layer has a single corresponding point in the geocoded mailing address layer.

Methods

We first ask, 'where do Door County landowners actually live?'. We wanted to understand this on the global, statewide, and county scales. To answer this question, we used the geolocated owner mailing addresses.

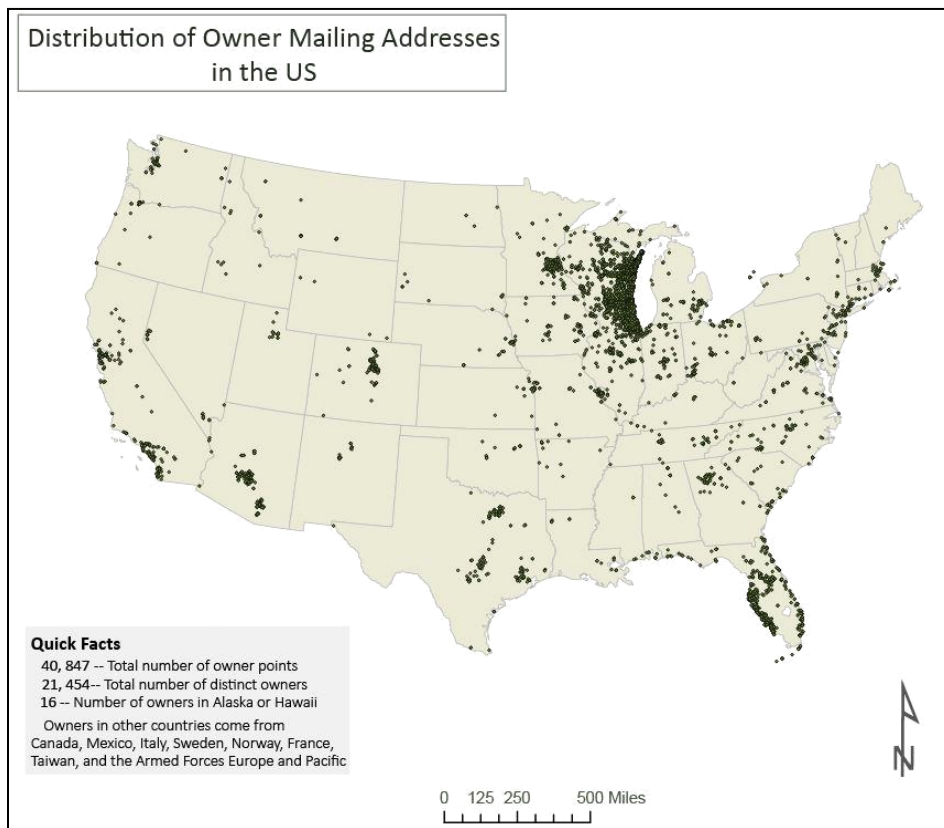


Figure 3: Owner mailing addresses represented as points in the US

As is indicated on the map, there are 40, 847 total owner points and 21,454 distinct owners. Owners live throughout the world. To find this information we performed the following queries:

Total number of owner points:

```
SELECT count(s.address)
FROM owners AS s;
```

Count of owners in States and non-US states:

```
SELECT count(address), state
FROM owners
GROUP BY state
ORDER BY count desc;
```

Owners not in the US:

```
SELECT o.country, count(o.geom)
FROM owners as o
WHERE country <> 'USA' group by o.country order by (count) desc;
```

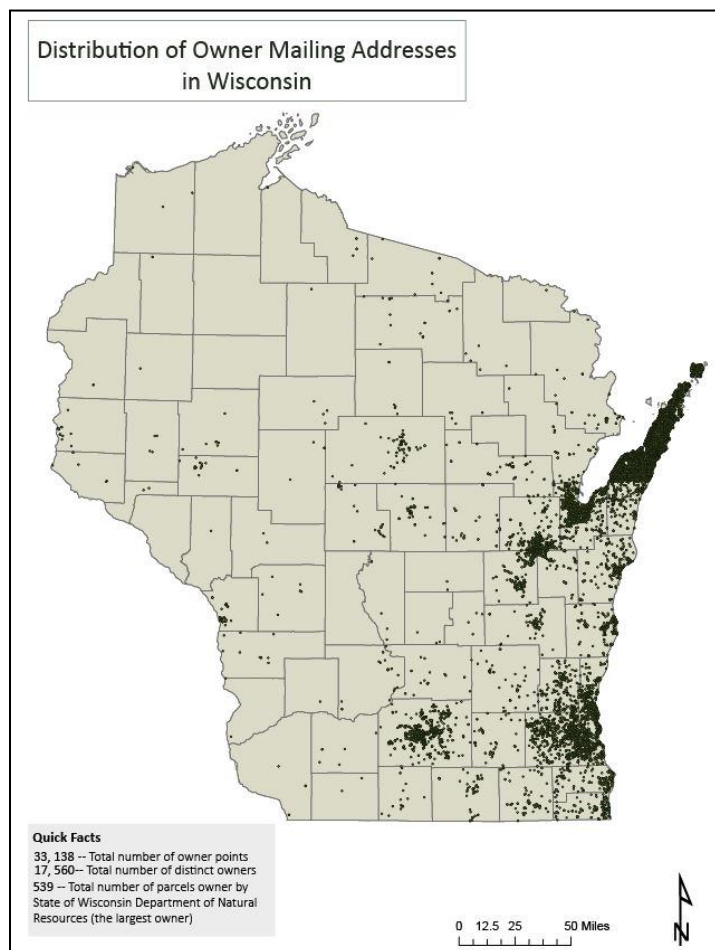


Figure 4: Owner mailing addresses represented as points in Wisconsin

In Wisconsin, as could be expected, most owner points are in Door County. Other point hubs are around Madison, Milwaukee, and the Fox Valley. Of Wisconsin owners, the State of Wisconsin Department of Natural Resources (DNR) owns the most parcels, followed by the Door County Land Trust (264 parcels) and the Nature Conservancy (176 parcels).

Number of points in Wisconsin:

```
SELECT count(s.address)
FROM owners AS o, states AS s
WHERE ST_within(o.geom, s.geom) and s.name = 'Wisconsin';
```

Distinct owners and owner parcel counts in Wisconsin

```
SELECT o.ownernme1, count(o.address)
FROM owners AS o, states AS s
WHERE ST_within(o.geom, s.geom) and s.name = 'Wisconsin'
Group by o.ownernme1 Order by count desc;
```

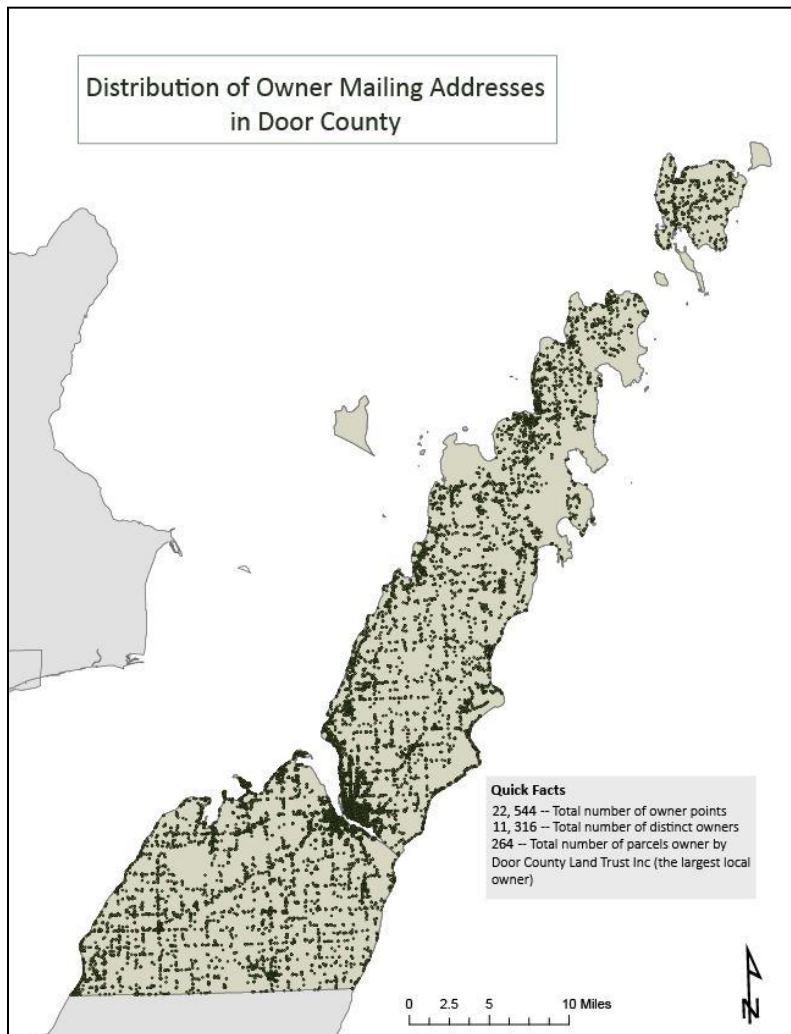


Figure 6: Owner mailing addresses represented as points in Door County

In Door County, most owners live in Sturgeon Bay and along the coasts. Parcels are smaller along the coast where there are more vacation homes than in the interior of the county where there is more farmland.

Number of points in Door County

```
SELECT count(s.address)
FROM owners AS s, counties AS n
WHERE ST_within(s.geom, n.geom) and n.county_nam = 'Door';
```

Number of distinct owners

```
SELECT o.ownername1, count(o.geom)
FROM owners as o, parcels as p
WHERE st_within(o.geom, p.geom)
group by o.ownername1 order by count desc;
```

We then normalized our data by dividing the count of points divided by the total number of points in each geometry, to show meaningful comparisons between state, county and municipal geometries.

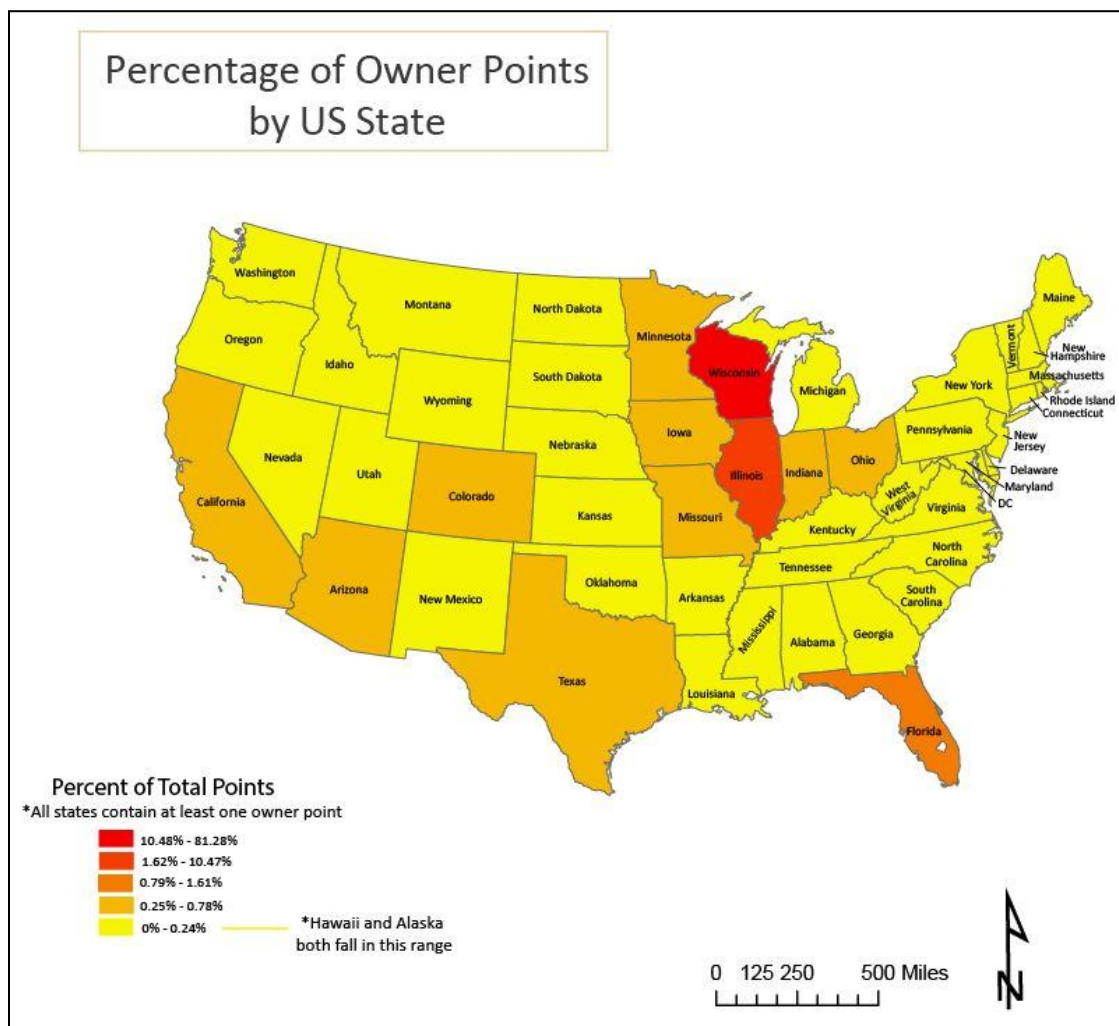


Figure 7: Percentage of points in each state

States with the highest percentage of owner points are in the midwest around Wisconsin, as well as Florida, followed by some southwestern states. Every state in the US contains at least one owner point (New Hampshire, Rhode Island and Delaware have the fewest owner points at 1, 2 and 2).

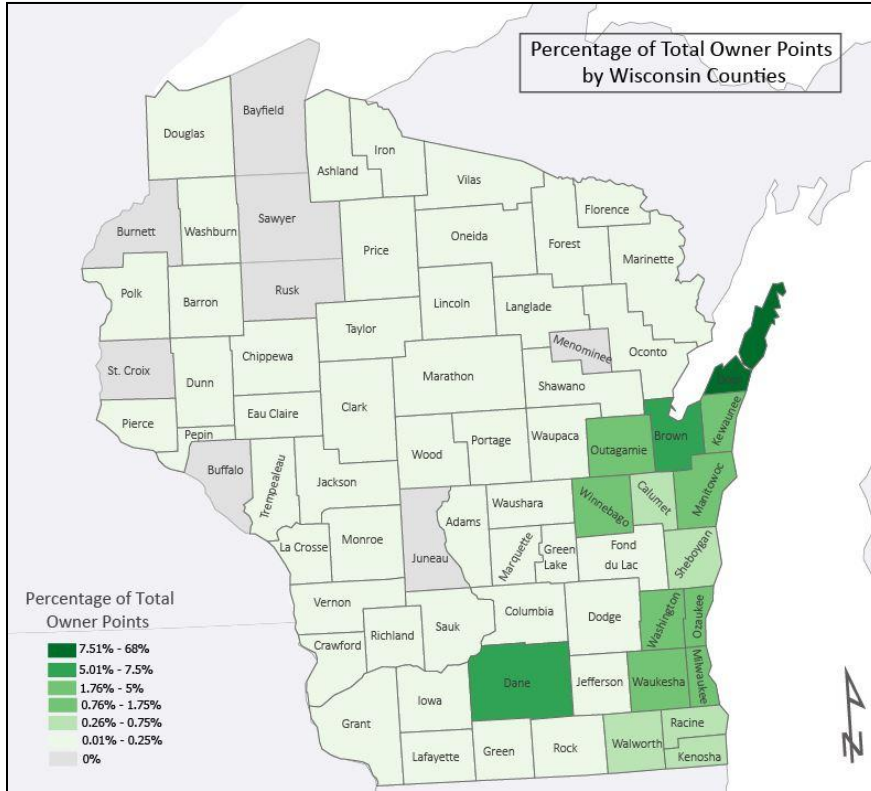


Figure 8: Percentage of points in each Wisconsin county

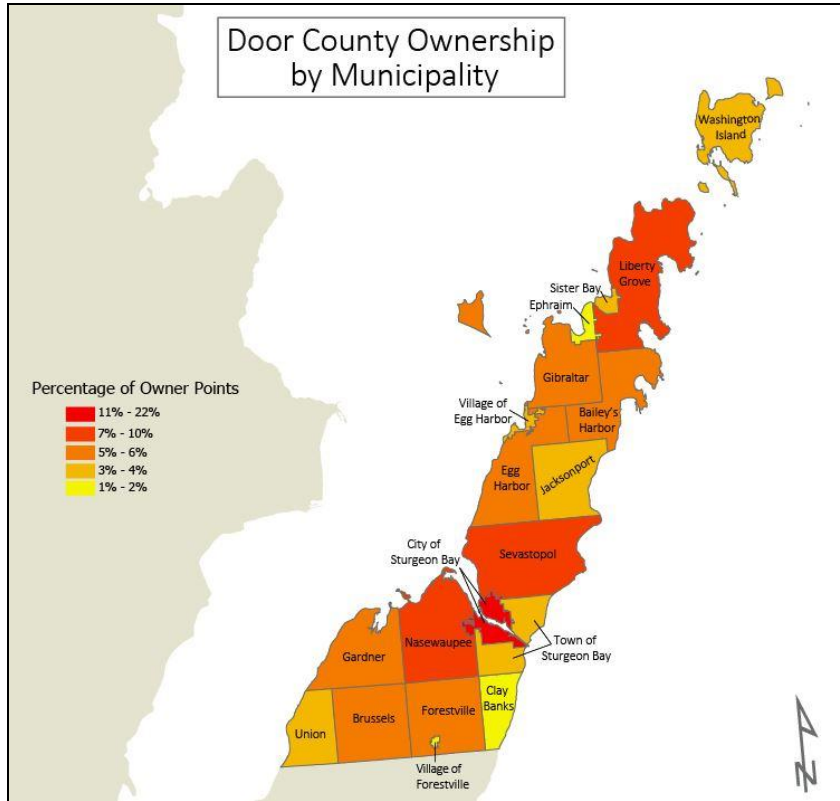


Figure 9: Percentage of points in Door County municipalities

US Total Percentages:

```
SELECT count(s.address), round((100*(count(s.address)/40847.0)::numeric),2) as
pct_total , n.name
FROM owners AS s, states AS n
WHERE ST_within(s.geom, n.geom)
GROUP BY n.name order by (count) desc;
```

Wisconsin County Percentages:

```
SELECT count(s.address), round((100*(count(s.address)/33188.0)::numeric),2) as
pct_total , n.county_nam
FROM owners AS s, counties AS n
WHERE ST_within(s.geom, n.geom)
group by n.county_nam order by pct_total desc;
```

Door County Municipality percentages:

```
SELECT count(s.address),round((100*(count(s.address)/22544.0)::numeric),2) as percent,
n.mcd_name FROM owners AS s, municipal AS n
WHERE ST_within(s.geom, n.geom)
group by n.mcd_name
order by count desc;
```


After analyzing the spatial distribution of owners, we then ask, which owners are local? To define local, we compared the parcel's site address to the mailing address of the owner. If those two attributes are the same, we assume the owner is local. We also combined this query with a comparison between the zip code of the site address and the zip code of the mailing address, because about 1,600 owner mailing addresses are PO Boxes with no street address (the layout for a PO Box is "PO Box ####, city, state, zip code). Using zip codes also makes it so that if one local owner owns multiple parcels that have different street addresses but are in the same general geographic area, they'll still be considered local. Using this definition, it's important to note that if an owner lives in Door County, that doesn't necessarily indicate that they'll be considered a local owner. For example, if an owner who's mailing address is in Sturgeon Bay owns land in Washington Island, the parcel in Washington Island will not be considered locally owned.

The parcel's site address is only the street address, so we compared the parsed 'address' attribute we created in our geocoded layer as a comparison to the site address of the parcel. For example, in the parcel database, the site address attribute for a parcel is '316 Virginia Terrace' and the owner mailing address is '301 E Pershing St Appleton WI 54914'. In our geocoded layer, we parsed the owner's mailing address so that one of the attributes is the street address. That makes it possible for us to compare '316 Virginia Terrace' with '301 E Pershing Street'.

To get a clearer understanding of local vs nonlocal ownership, we merged parcels with the same owner using the 'dissolve' tool in Arcgis PRO, and by selecting 'distinct' owners in Postgresql. 'Distinct' in this context means displaying only one record of an attribute that may contain many records. For example, if we search for all owners in our database, we get ~200 records where the owner is 'State of Wisconsin DNR' and ~100 where the owner is 'Door County Land Trust'. If we search for all *distinct* owners, we will get two records, the State of Wisconsin DNR and the Door County Land Trust.

We also used the parcel's 'aux class' attribute to separate public land. Attributes of X1, X2, X3, and X4 indicate federal, state, county, and other exempt (Wi DNR, Door County Land Trust are examples of X4 parcels).

PO Box Mailing Addresses:

```
SELECT count(*) FROM owners WHERE address like 'PO BOX%';
```

(4,335)

Distinct PO Box Owners:

```
SELECT count(distinct(ownernme1)) FROM owners WHERE address like 'PO BOX%';
```

(1,609)

Fish Creek Parcel Ownership

Green Bay

Example of Owner Mailing Addresses

- Reno, NV
- Winneconne, WI
- Egg Harbor, WI
- De Pere, WI
- Chicago, IL
- Chicago, IL
- Sugar Grove, IL
- Highland Park, IL
- De Pere, WI
- Evanston, IL
- Chicago, IL
- Palm Beach, FL
- Chicago, IL

- Water
- Public Land
- Merged Parcels (Non Local)
- Merged Parcel where Site Address = Postal Address
or Site Zipcode = Postal Address Zipcode (Local)

0 0.2 0.4 0.8 Miles

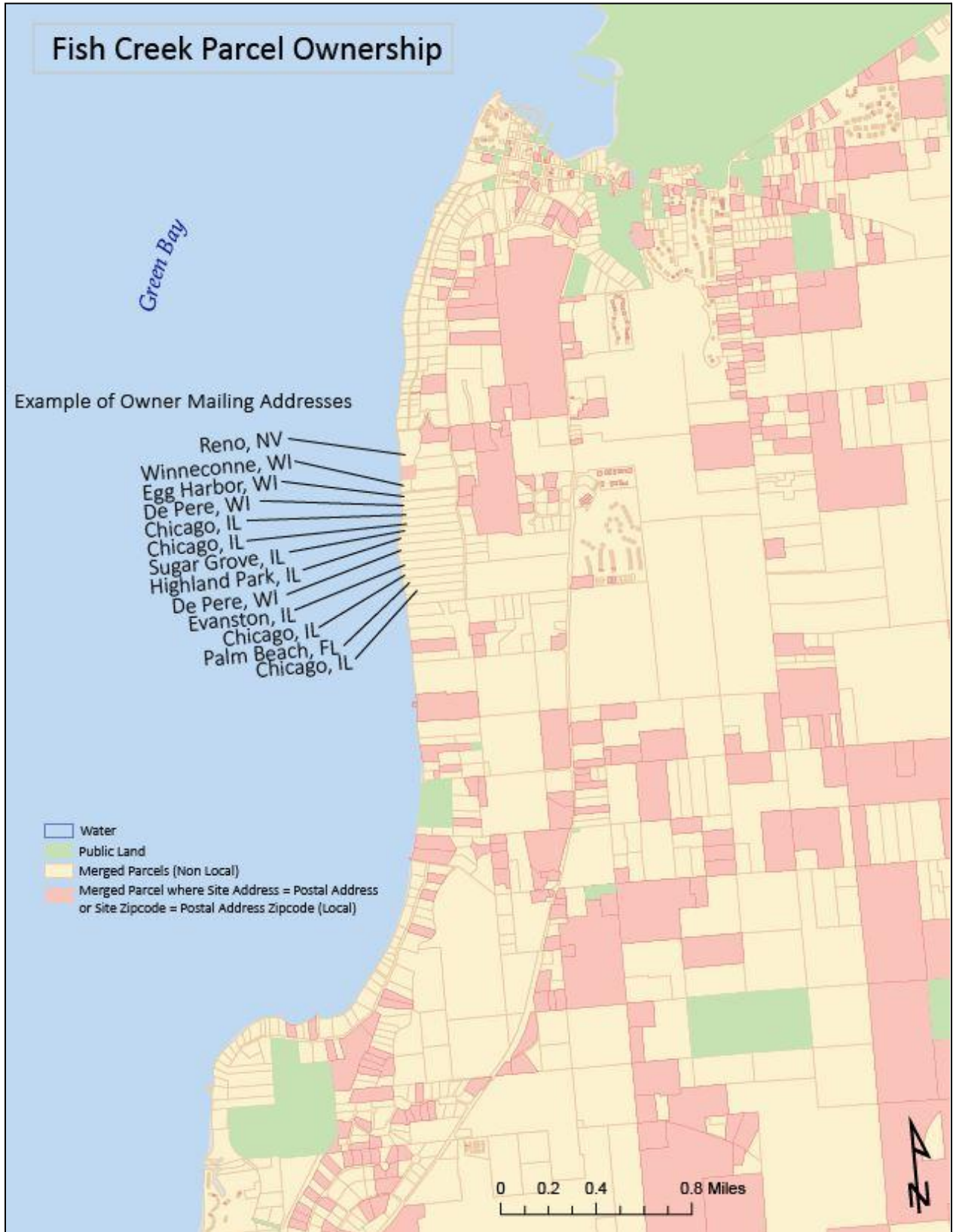


Figure 10: Local vs Non Local ownership zoomed into Fish Creek

Our Fish Creek case study map shows an example of coastal and interior ownership. Along the coast, there are many smaller parcels, and the owners are mostly non-local. We can compare the number of distinct parcel owners in Door County (26,017) to the number of local distinct owners (8,527) to get an understanding of local ownership.

Distinct Parcel Owners:

```
SELECT count(distinct(ownernme1))
FROM parcels;
(26, 017)
```

Distinct Public Lands:

```
SELECT ownernme1, count(*)
FROM parcels where auxclass = 'X4' or auxclass = 'X3' or auxclass = 'X2' or auxclass =
'X1' group by ownernme1 order by count desc;
```

Number of distinct local owners

```
SELECT count(distinct(ownernme1))
FROM (select ownernme1 from owners where zip code=zip code_1 or
siteadress=address) owner;
(8, 527)
```

So what else can attributes in the parcel database reveal about land ownership in Door County? With the 'assdacres' (assessed acreage) and 'cntassdvalue' (total assessed value) attributes, we can analyze acreage and land value. Assessed acreage refers to the size in acres of a parcel and assessed value refers to the cost of the parcel. First we can look at how much land in acres each distinct owner owns.

Sum of land acreage by distinct owner:

```
SELECT sum(st_area(geom)) as area, ownernme1
FROM parcels
group by ownernme1 order by area desc;
```

The 3 owners with the most acreage of land in Door County are the State of Wisconsin DNR (46,000,000 acres), the Door County Land Trust (18,000,000 acres) and the State of Wisconsin (14,000,000 acres). Note: in the database, the 2nd highest land owner is actually a <null> value. This is because the parcel database includes road and water polygons, which have <null> values in the owner column, but still have a size attribute.

Sum of land value by distinct owner:

```
SELECT round(sum(cntassdval),2) as cost, ownernme1
FROM parcels where cntassdval>0
group by ownernme1 order by cost desc;
```

Average value of non-zero parcel groups:

```
SELECT round(avg(cntassdval),2) as cost
FROM parcels where cntassdval>0;
($198,568.71)
```

Land Value by parcel:

```
SELECT (cntassdval) as cost
FROM parcels where cntassdval>0
group by cntassdval order by cost desc;
```

Highest Valued Parcel: Hatco Corporation \$8,557,700

The average assessed value per parcel is \$198,568.71. Parcels along the coast are generally higher in value than parcels in the middle of the county partly because lakefront property is in high demand. The owner with the highest total assessed land value is 'Hedeem Development Inc' with a total value of \$11,158,200.

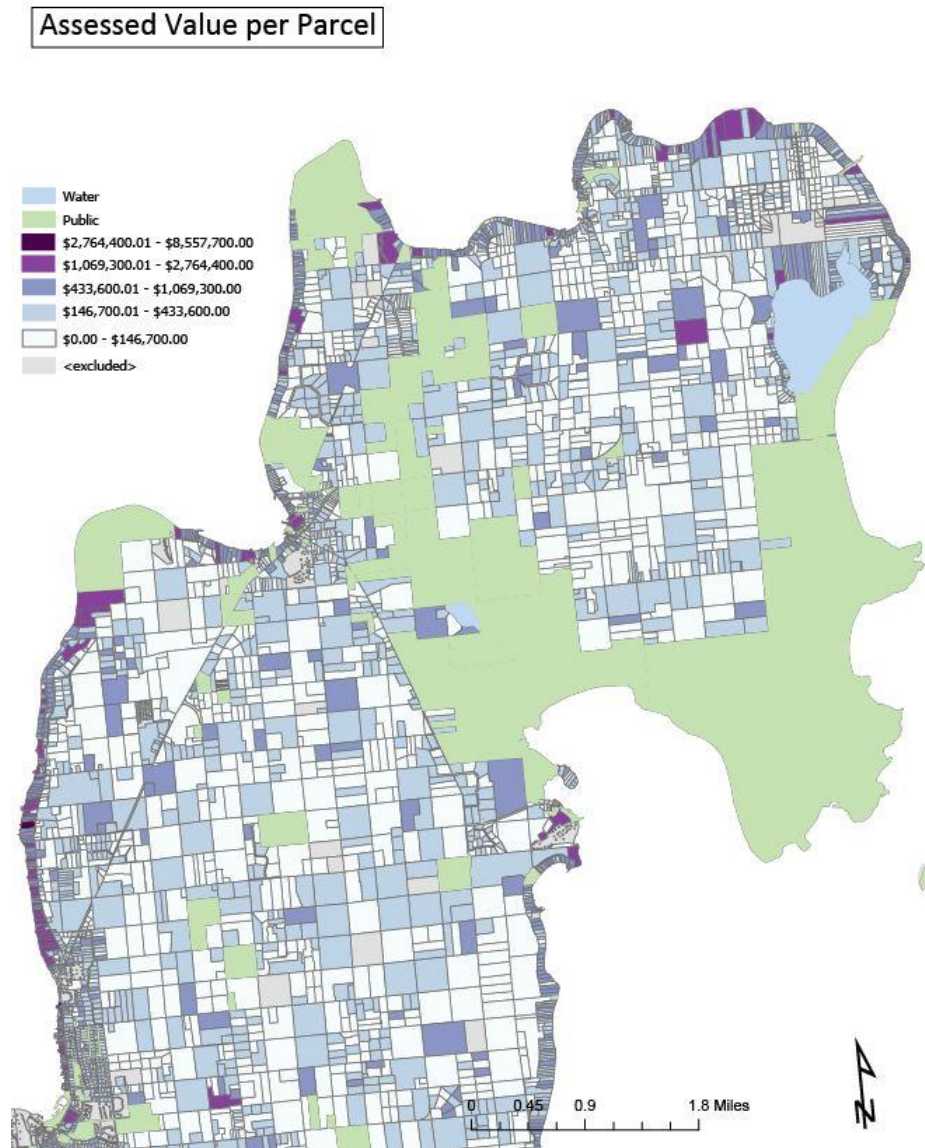


Figure 11: Example of assessed value per distinct owner at the Northern edge of the county

We can also look at the average value of parcels grouped by municipalities in Door County. This query compares the cost of land in each municipality.

```
SELECT round(avg(cntassdvalue),2) as cost, placename
FROM parcels
Group by placename
Order by cost desc;
```

First seven entries of query result:

Average value (cost)	Place Name
344,926.72	VILLAGE OF EPHRAIM
324,415.18	VILLAGE OF EGG HARBOR
281,395.90	VILLAGE OF SISTER BAY
271,697.30	TOWN OF GIBRALTAR
236,722.75	TOWN OF LIBERTY GROVE
225,436.76	TOWN OF BAILEYS HARBOR
221,905.28	TOWN OF SEVASTOPOL

Results

Using the statewide parcel database and PostGIS, we have been able to answer the questions 'Where do Door County landowners actually live?', 'How much of Door County is locally owned?', and 'What can parcel attributes reveal about land ownership?'

Our results show that people come from all over the world to own land in Door County. According to our query results, 20% of parcel owners live outside of Wisconsin, and .05% live outside of the US. International owners are mostly from Canada but also come from Europe, Mexico, the Armed Forces, and Taiwan. Nationally, 81% of parcel owners live in Wisconsin, and 55% live in Door County. The owner with the most parcels is the State of Wisconsin DNR who owns 539 parcels. Their parcels are made up of state parks like Potawatomi State Park, Rock Island State Park, and other public or research land.

Of the 26, 017 distinct parcel owners, 8,527 of the parcels have either a site address that is equal to the owner's mailing address or a site address zip code that is equal to the owner's mailing address zip code. Using this definition of local, we can consider 33% of distinct owners in Door County to be local.

Attributes from the parcel database like acreage and land value make it possible to understand how much land owners own and how much their land is worth. The State of Wisconsin DNR owns the most land at 46,000,000 acres. The average value of parcels in Door County is \$198,568.71 and the highest valued parcel is worth \$8,557,700.

References:

GeoData@Wisconsin, <https://geodata.wisc.edu/>.

Marcus, J.S. "Door County Lives up to Its Nickname as the Midwest's Cape Cod." *The Wall Street Journal*, Dow Jones & Company, 12 Aug. 2021, <https://www.wsj.com/articles/door-county-wisconsin-real-estate-news-11628787522>.

Weichelt, Ryan Douglas, and Ezra Zeitler. "Second Home Property Ownership and Public-School Funding in Wisconsin's Northwoods." *Geographical Review*, 2021, pp. 1–26., <https://doi.org/10.1080/00167428.2020.1855583>.

Wisconsin State Cartographer's Office (SCO), Wisconsin Department of Administration (DOA). "Statewide Parcel Map Initiative . . . Statewide Data." <https://www.sco.wisc.edu/Parcels/Data/>, <https://www.sco.wisc.edu/parcels/data/>.