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Spring migration of Great Egrets into Ontario: an eBird analysis

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Introduction

In spring, Great Egrets (*Ardea alba*, henceforth egrets) are known to arrive in Ontario in late March and early April (Speirs 1985, Curry 2006, Weir 2008, Black and Roy 2010). Both Bent (1926)

and McCrimmon *et al.* (2011) gave spring dates by which egrets reached certain northerly migration points, *e.g.* 20 March in Ohio. So, although there is good information on the timing of the egrets' arrival in or near Ontario,

there is little specific information available on where they arrive from or the routes that they use to enter Ontario. Considering that there are nesting colonies of egrets in Ontario located in western Lake Erie, on the north shore of Lake Ontario, on the west shore of the Bruce Peninsula and in southern Georgian Bay, there are several possible routes of arrival. For example, egrets could arrive predominantly from New York via the Niagara Peninsula, from Michigan and Ohio through Essex County and the Lake Erie islands, from upstate New York around the east end of Lake Ontario or they could come on a broad front across all these areas and lakes Ontario and Erie. The main wintering area of egrets in eastern North America is along the southern Atlantic coast from North Carolina through Florida and into the Caribbean islands as well as along the Gulf of Mexico (Bystrack 1974, Root 1988).

Spring observations of egrets at various provincial locations have been recorded by Ontario birders for decades (see above) but these observations were not available widely until well after the fact. In recent years, Ontbirds, the listserv of the Ontario Field Ornithologists, has facilitated greatly the immediate and widespread reporting of arriving migrants. Now, however, a new online tool, eBird, makes it possible to track species-specific migration (spring or autumn) in real-time and to portray that information visually on maps to a wide audience immediately. eBird is an internet-

based method of recording bird observations (Burrell 2012, Cadman 2012, eBird.com); it accepts current as well as historical bird observation records in the form of “checklists” for given areas. More importantly for one who may want to analyze bird data, if species-specific records are requested for sequential time periods (e.g. the first week of April, second week of April, and third week of April), eBird will plot the distribution of sightings for those time periods on individual maps.

Comparing the maps sequentially shows the progression of migratory movements for the requested species. eBird can also provide data on flock size and the number of individuals per checklist. These kinds of data contribute to interesting information on the migration strategy for individual species. In this paper, we demonstrate how eBird can be used to track the spring migration of Great Egrets from their wintering grounds (in February), through spring migration (March and April) and into June, when they are resident on their colonies and migration has ceased. The Great Egret is a very suitable species for this exercise as it is large, very visible, often reported and easy to identify.

Methods

eBird data were retrieved and analyzed through the Avian Knowledge Network (AKN, <http://www.avianknowledge.net/content/contribute/the-bird-monitoring-data-exchange>). For this paper, our study area was the Great Lakes Basin

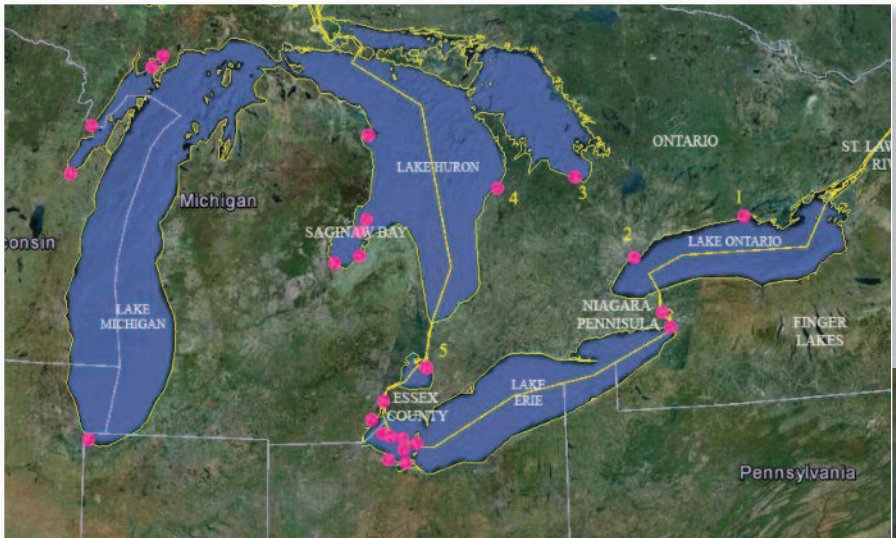


Figure 1. The Great Lakes study area including state/provincial boundaries, place names and locations of breeding colonies of Great Egrets (purple dots, those in Canada are numbered). 1. Gull Island, Presqu'île Provincial Park, Brighton, 2. Toronto Harbour, 3. Nottawasaga Island, Collingwood, 4. Chantry Island, Southampton, 5. Walpole Island, Wallaceburg.

though larger areas were often used to show a broader perspective. We requested all eBird records of Great Egrets for North America (AKN accessed 26 February 2012). This provided a dataset in excess of 400,000 records and allowed for analysis of daily egret records from the study area.

From the above records, we screened for reports of egrets for six time periods for the years 1900 – 2012. Taking late March as the earliest average arrival dates for egrets in southern Ontario (see above), we estimated that records from the first week of March onwards, would show the migration towards and into Ontario. We chose the dates 1 – 15 and 16 – 31 March and 1 – 10 and

11 – 20 April to reflect the initial and ongoing stages of spring migration into Ontario. We used the shorter time periods in April to allow for a finer presentation and analysis of the data and for the greater volume of reports as migration into the Great Lakes Basin progressed. We also used data from 1 – 15 February to show the winter distribution of egrets in eastern North America and data from 1 – 15 June to show the summer distribution of egrets in southern Ontario after migration was over.

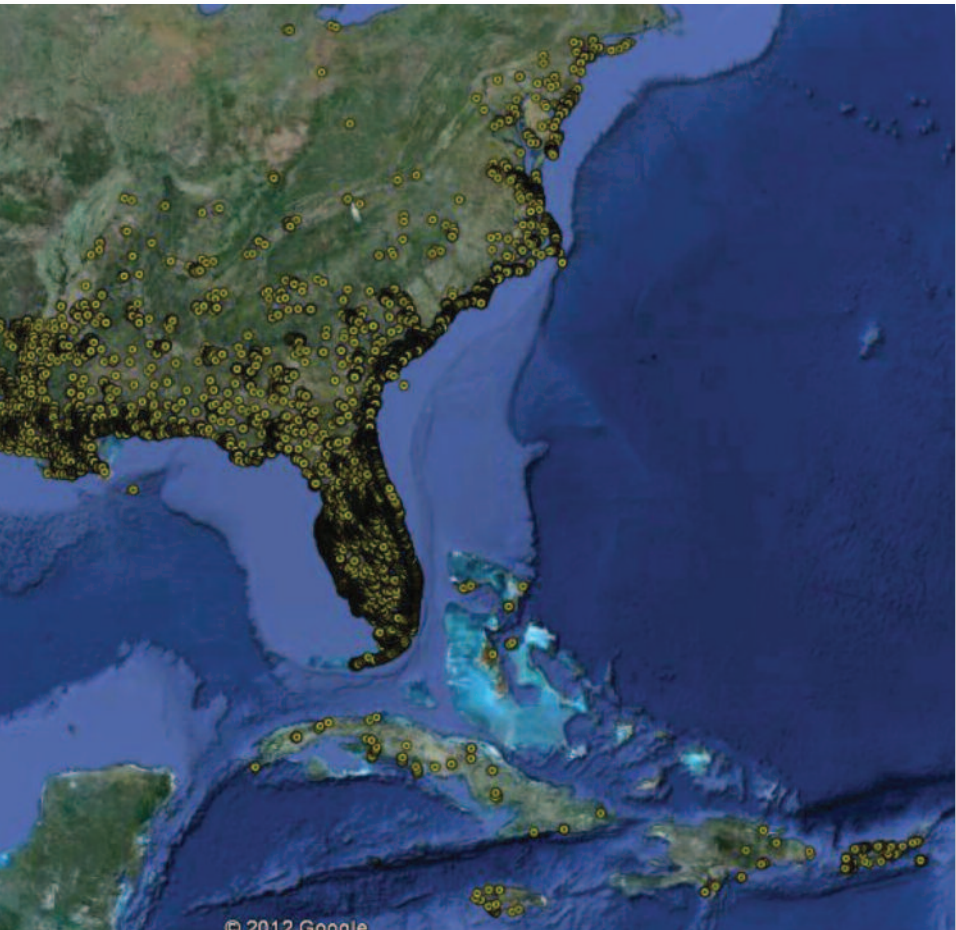
The locations of checklists reporting egrets were plotted on maps. Political jurisdictions, geographical place names and locations of breeding colonies of egrets within the study area (Peck 2007,

CWS unpubl. data, F. Cuthbert unpubl. data), to which at least some of these birds probably were headed, are shown in Figure 1. For clarity's sake, these are only shown on Figure 1 and not on Figures 2–7.

Figure 2. The distribution of eBird checklists reporting Great Egrets from the area east of the Mississippi River during the winter period 1–15 February.

Results

The winter distribution (1–15 February) of egrets in eastern North America is shown in Figure 2. There are three sightings from Ohio (south of Lake Erie) but the rest of the sightings come from the U.S. coast from New York to New Orleans, the inland half of the southeastern U.S. and the Caribbean Islands.



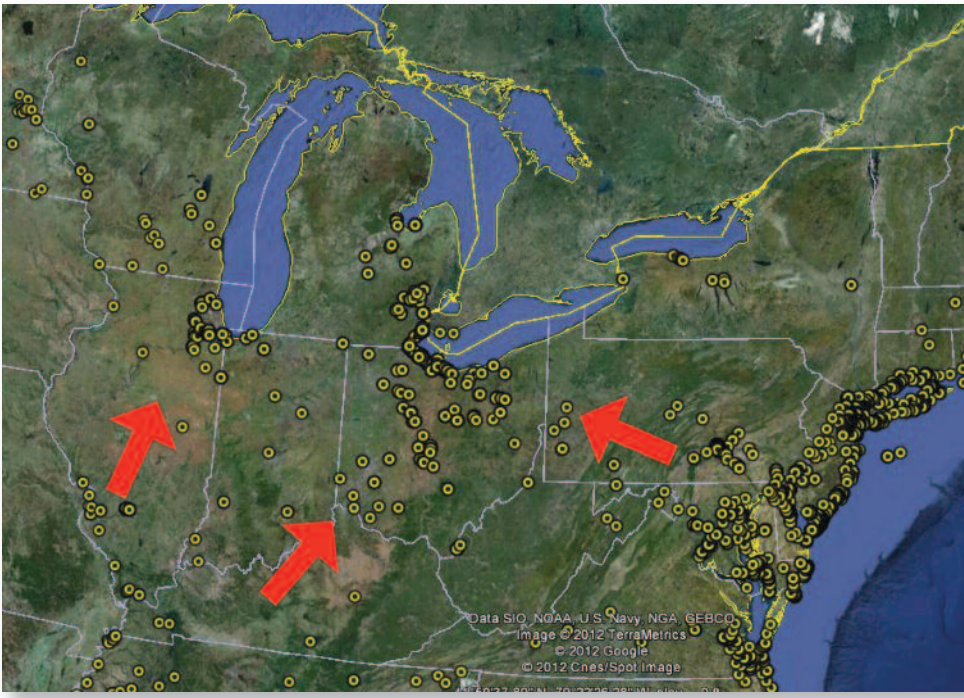
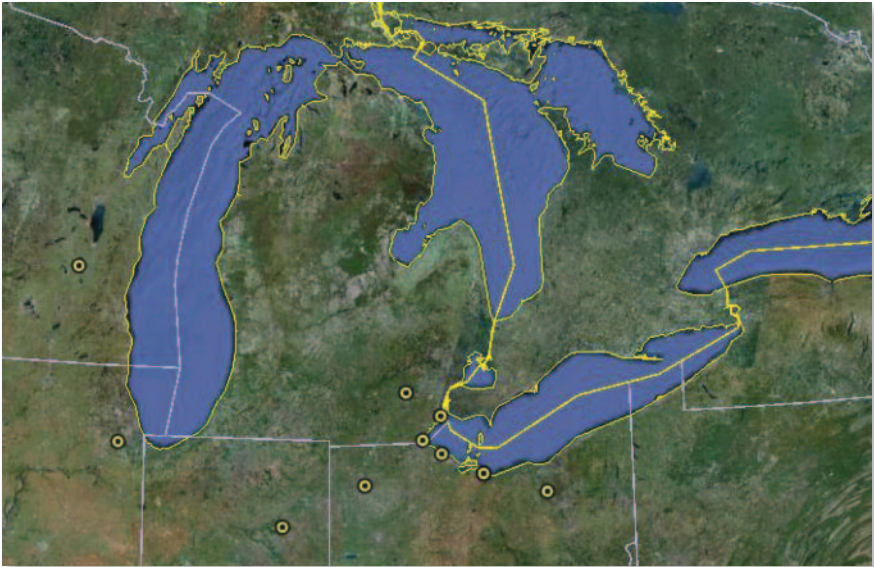


Figure 3. The distribution of eBird checklists reporting Great Egrets from the Great Lakes Basin during 1 – 15 March.

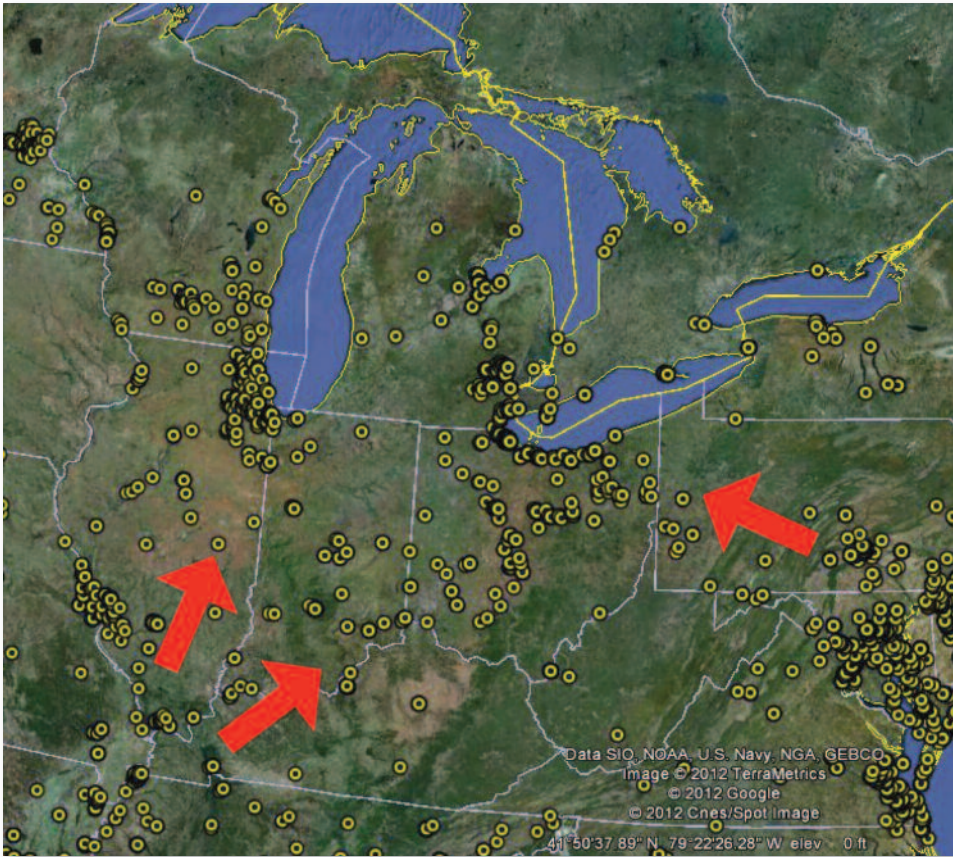
Figure 4. The distribution of eBird checklists reporting Great Egrets from the area east of the Mississippi River during 16 – 31 March. Arrows indicate possible areas of concentrated migration (see text).

For the period 1 – 15 March (Figure 3), eBird data showed 10 locations where egrets were reported: five from Ohio, two from Michigan and one each from Indiana, Illinois and Wisconsin. None were reported in Ontario and none were reported from the Niagara Peninsula or along the eastern end of Lake Ontario. For the latter half of March (16 – 31 March, Figure 4), there was a massive increase in the number of checklists which reported egrets in the Great Lakes Basin area (on each checklist the number of egrets reported is variable). Along the Great Lakes, there were major areas of concentration in western Lake Erie and southern Lake Michigan. There is evidence of a line of observations (a migration corridor/ route?) from just north of Chesapeake Bay in Maryland northwest towards western Lake Erie. There is also evidence of an area of concentration in southern Illinois with possible lines of observation moving northeast towards both southern Lake Michigan and,

slightly more easterly, towards western Lake Erie. It also appears that there is a line of observations northward along the west coast of Lake Michigan. There are a few reports of egrets from the Niagara Peninsula-Finger Lakes. This may be suggestive of a minor migration corridor along this route as well. It is noteworthy to see that there are no reports from the eastern two-thirds of the south shore of Lake Erie or the eastern end and north shore of Lake Ontario.

During the first ten days of April (Figure 5), the areas of intense egret reporting and the lines of observation observed in late March are still evident. Areas of concentration include south/southwestern Lake Michigan and western Lake Erie. Lines of egret reporting extend from southwestern Illinois at the Missouri border to southern Lake Michigan and then up the west shore of that lake to southern Green Bay and into south-central Wisconsin. A line of observation also extends from southern Illinois to the northeast towards western Lake Erie. This line seems to be joined by one extending northwestward from the area of Delaware-Maryland and the Chesapeake Bay on the Atlantic coast. Once at the western end of Lake Erie, lines of observation go NNW towards Saginaw Bay (Michigan) and to the east and northeast into Ontario. The minor line of observation through the Finger Lakes-Niagara Peninsula still persists and may be originating in Massachusetts.





For 11–20 April (Figure 6), all of the apparent lines of observation described for 1–10 April (Figure 5) are still present. The concentration of egret reports in S/SW Lake Michigan have expanded northwestward into SE Minnesota. The two-pronged movement NE out of southern Illinois is still evident. The movement out of the Chesapeake Bay areas appears to be on more of a broad front than previously. There are

more egret reports in central southern Ontario and along the north shore of Lake Ontario than previously, as well.

There are still noteworthy areas of few if any reports: the eastern shore of Lake Michigan and the upper peninsula of Michigan and all of eastern Ontario and the Adirondack mountains in northern New York. There are a small number of reports up the east side of New York State, perhaps following the Hudson

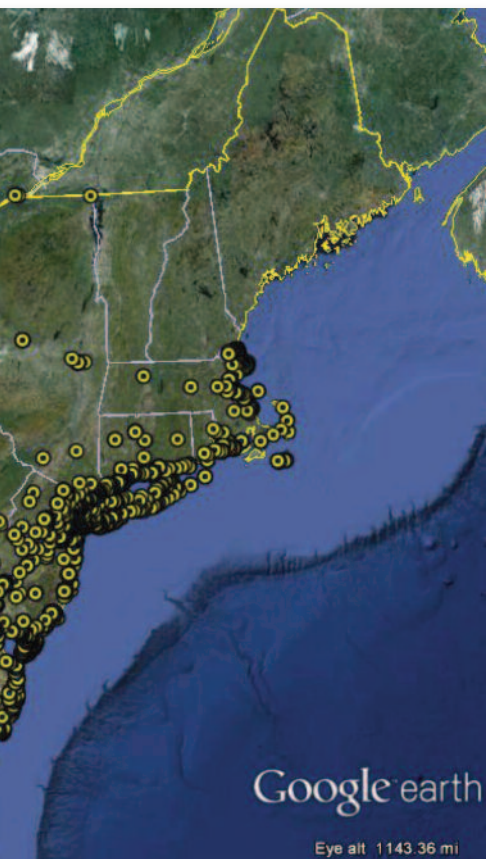


Figure 5. The distribution of eBird checklists reporting Great Egrets from the area east of the Mississippi River during 1 – 10 April. Arrows indicate possible areas of concentrated migration.

Great Lakes. The major areas of reporting are the corridor from western Lake Erie to Saginaw Bay and the entire western shore of Lake Michigan and inland in central Wisconsin. Lesser areas of reporting are the north shore of Lake Ontario, the base of the Bruce Peninsula and surrounding area and the area from the Niagara River east to the Finger Lakes.

Discussion

The eBird data for early spring migration (March – mid-April) of egrets into the Great Lakes Basin show the largest area of reporting comes from the western end of Lake Erie after arriving from the southeast and the southwest. From there, there is a strong movement NNW towards Saginaw Bay (Michigan) and, once around the west end of Lake Erie, egrets also appear to go eastward along the north shore of Lake Erie, where there could be a mixing with egrets who have crossed Lake Erie via the archipelago of the western Lake Erie islands. The south end of Lake Michigan (though not of consequence for Ontario) is a second area of major arrivals. Egrets may have arrived there via a NW movement from (or before reaching) western Lake Erie but also via a strong line of observation from southern Illinois. Such a movement

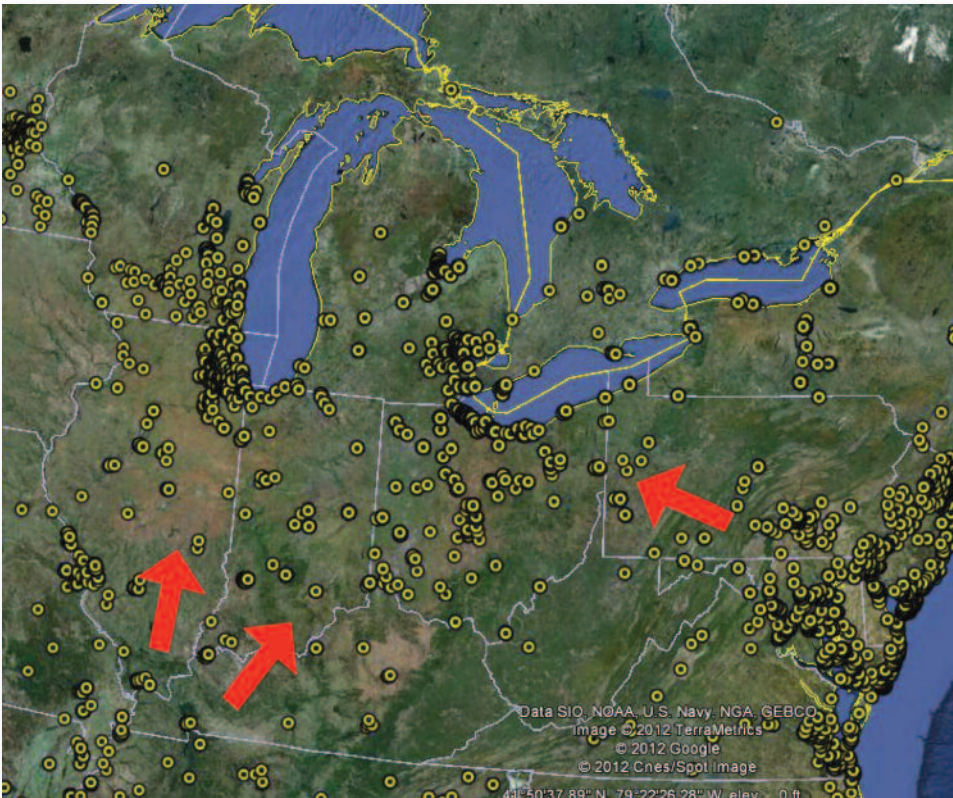
River and Lake Champlain valleys. To the northwest of there, egrets appear again in the St. Lawrence River and the Ottawa River. It remains to be seen, however, if that is a continuous migration corridor. Back on the Atlantic coast, egrets have moved into coastal Maine during this period.

The data for 1 – 15 June (Figure 7) show the summer distribution of egret sightings in southern Ontario and the

would suggest those birds originated from the Gulf of Mexico as opposed to the birds at the west end of Lake Erie which probably arrived from the Atlantic coast. There appears to be a small and not very concentrated movement of egrets westward through the Niagara Peninsula and little or no movement around the east end of Lake Ontario. Thus, most Great Egrets would appear to come into Ontario via Essex County.

In using eBird data, it must be remembered that records come from where birders submit their checklists. When an area does not show any birds (egrets) present, the first question one must ask is “Does the lack of reports indicate no birds or no birders in a given area?” For example, the few reports of egrets in spring from the Ontario portion of the Niagara Peninsula is probably reflective

Figure 6. The distribution of eBird checklists reporting Great Egrets from the area east of the Mississippi River during 11 – 20 April. Arrows indicate possible areas of concentrated migration.



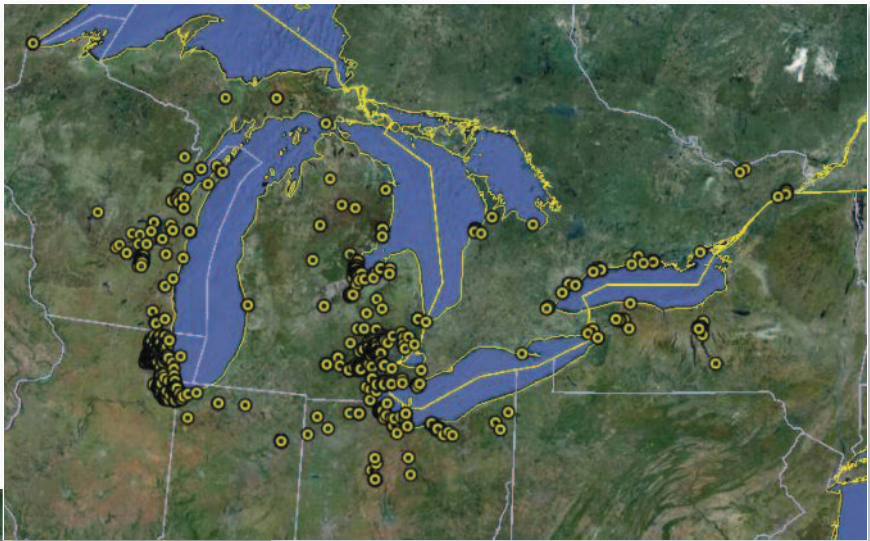
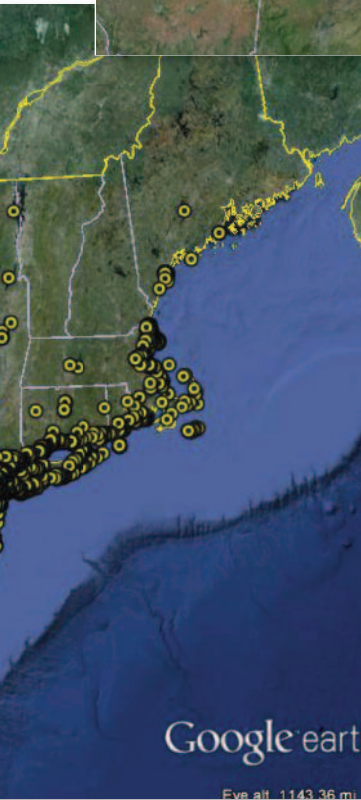


Figure 7. The distribution of eBird checklists reporting Great Egrets from the Great Lakes Basin area during the summer, non-migratory period 1 – 15 June.



of few egrets. There would seem to be many birders in that area given the human population of the area (Buffalo, Fort Erie, Niagara Falls (NY and ON), St. Catharines, Grimsby, Hamilton, etc.). However, the lack of reports in other areas, *i.e.* on the east shore of Georgian Bay or the relatively few reports from southern the Georgian Bay area (given it is the location of Ontario's largest breeding colony of egrets), probably reflects a small number of birders reporting in those areas.

Given this caveat, the small number of reports of egrets using the east end of Lake Ontario, as a spring access route into the province, might be fairly accurate. There is a good representation of Ontario birders at the east end of Lake Ontario and apparently few egrets in spring (Weir 2008). However, a second caveat, noted by Cadman (2012) is that (until recently) birders in Ontario/Canada did not yet use eBird as widely as did birders in the U.S.

This has changed dramatically in the last year; eBird reports from Ontario birders are now second only to those from birders in California (see eBird.com).

Another interesting feature contributed by this eBird analysis pertains to the use of roost sites by egrets in spring. Birders reporting egrets on the Ontbirds listserv and other Ontario birders have helped us locate upwards of 40 autumn roosting sites of egrets in the Lower Great Lakes Basin (DVCW unpubl. data). Very few of these roosts appear to be occupied in the spring, though our coverage then is somewhat limited. However, one of the roosts that is active in spring is at Muddy Creek in eastern Essex County (Weseloh and Wormington 2010). It stands to reason that there could be large numbers of egrets in the Essex County area in the spring, as a result of a major movement of birds eastward along the north shore of Lake Erie from the Detroit River and northward across the Pelee Island archipelago. The roost site at Muddy Creek might be one of the first traditional and safe overnight resting areas egrets encounter as they come from northern Ohio, following the migration routes proposed here.

Hopefully, this account gives our readers a first-hand view of the type of information and analysis that is available by contributing their checklists of bird observations to eBird. We also encourage Ontario birders to visit eBird and the AKN and investigate the data for their favourite species.

Acknowledgements

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