Regional Weather, Region 2 Area, USPS

Lake Ontario, Oneida Lake, 1000 Islands, St. Lawrence River,
Finger Lakes, Erie Canal, and the Eastern portion of Lake Erie

Written and submitted by

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I. Overview of Local Weather

Local weather is characterized by a few identifiable factors in each season of the year, and depending on the length of the look ahead ,predictability is as follows:

A. Long term climate, 10 years or more, is reasonably predictable. Seasonal temperatures, precipitation and winds do not fluctuate in the long term average, except possibly as a result of global warming, and then imperceptibly.

B. Medium term climate, 1-9 years; predictability is fair. Droughts in the Lake Ontario region seem to span 5-7 years, followed by wetter spells for similar periods, as seen by lake level and agriculture trends. Our patterns are shaped by adjoining regions, generally in the western Great Lakes whose precipitation levels heavily affect Lake Ontario, as the "last in line". Although our long-term climate may be somewhat affected by phenomena such as El Nino and La Nina, their effects are seen more in the southwest, with increased rainfall, and in the Caribbean with less hurricanes but more convective activity.

C. Short term climate (or long term weather), less than one year; predictability is difficult due to so many variables such as wandering serpentine jet streams and associated frontal systems, El Nino Southern Oscillation (ENSO), and possibly La Nina effects.

D. Moderate term weather (one month) predictability is a bit better since El Nino and La Nina phenomena have been identified for the season, and evolving jet stream patterns become clearer.

E. Shorter term weather (one week) predictability is reasonably good due to observance of polar and subtropical jets and their associated highs and lows, together with frontal movements. However, such clarity is still insufficient to schedule boat trips, ski trips or other weather dependent activities in this region with much confidence.

F. Short term weather (48 hours and less); predictability is excellent due to knowledge of current jet stream position and movement, frontal movement tracking, and availability of surface weather maps and winds aloft charts up to 500 mb.

From the above, we see that the central New York State region has widely variable weather, perhaps with greater frequency of change than any other region in North America. At the same time, our weather is mostly free from catastrophic activity such as hurricanes, tornadoes, and other "killers" Our temperate climate keeps us virtually clear of wild, prolonged swings in temperatures, such as less than -20F or greater than + 95F.

II. Seasons providing the best and/or worst boating

January- March: Zero boating opportunity. All local waters, including Lake Erie and Ontario, are completely frozen or at least partially so around shorelines.

April: Ice melts, usually in the latter half of April, and Lake Ontario may be navigable, but frigid and dangerous. Lake Erie, being shallower, has rough and confused seas.

May: Boating is possible, but uncomfortable, early in May in most of the region's waterways, but it becomes much better as the month progresses. Advection fog is prevalent on Oneida Lake and Lake Ontario through much of this time. Water temperatures range in the 40's and low 50's. Frontal thunderstorms begin to appear late in the month.

June: is the real beginning of our boating season, with mild (70's) temperatures and warming water. Of concern are the frontal thunderstorms, which often pass through, sometimes preceded by powerful squall lines.

July: Peak of the boating season, with warm days and comfortable water temperatures. Somewhat increased threat of air mass thunderstorms, usually in the afternoon and evening. Winds are usually moderate and from the southwest.

August: Again, peak of the boating season, like July, but toward the end of the month nights become cooler with less relative humidity and convective activity.

September: Continued good boating weather with cooler days on interior waterways and reasonably warm days and water temperatures on Lake Ontario.

October: Fairly good boating on most local waters with dry, cool temperatures and chilly nights. Thunderstorms rare, but cold front activity increases in frequency as the month progresses. Northwest winds begin to intensify. Hauling time approaches.

November: Although water temperatures in the deeper waters remain tolerable, winds and cold front passages increase and wind directions often swing to the northwest. Highly challenging boating, and most boaters haul their vessels.

December: Boating is almost non-existent except for hardy fishermen and those moving their boats east through the Barge Canal before it closes. Ship traffic remains on Lake Erie, Lake Ontario and through the St. Lawrence Seaway until it closes, usually in early January.

III. Where does the weather come from?

As we recall, warm air rises at the equator and moves north, being deflected to the right, or east, by Coriolis force. Similarly, air over the north pole begins its lower level "dome" journey southward toward the equator and is likewise deflected to the right, becoming an east wind, resulting in an air "pile-up" at about 30 and 60 degrees north latitude. The added weight of this air increases the pressure into semi-permanent high-pressure belts, which conflict with the simple convective transfer between the pole and the equator. The restless atmosphere cannot live with this impediment to reaching equilibrium and something must give. Huge masses of air begin overturning in our latitudes to try to complete the exchange, producing westerlies and southwesterlies, and the collisions of cold and warm air set up a mid-latitude band of ever-changing weather. While this is true for most of our latitude, in central New York we find the influence of the waters of the Great Lakes exacerbating this already turbulent condition, along with the continental polar air masses, which sometimes extend into the region. The mix causes moderately heavy precipitation, but remarkably well distributed over the year.

Along with the fundamental weather origins just described, there are three basic air mass patterns invading our area. The first is the cold, dry continental air mass, already mentioned, which picks up Great Lakes moisture as an ingredient to "lake effect" precipitation, the second is a tropical air mass transporting warm humid air northeast from the Gulf of Mexico, and the third, of lesser impact, is a maritime air mass flowing inland from the North Atlantic Ocean on a counterclockwise low, sometimes called a "Nor-easter".

IV. What systems bring good and bad weather?

Basic air mass systems, when mixed and in conflict, present confusing and unpredictable situations. However, when taken singly, each air mass system contains predictability, which we will now consider.

The primary fair weather system in our region is the continental polar air mass which is brought to us by a deepening Arctic high propelled by a subtropical jet stream moving to the south in a wide arc so that it forms a large "U" over the Great Lakes basin. The high moves south behind the jet. When we are within the deepened high our weather is generally good. In summer, when the jet is north of us and not distended or bowed our weather tends to be good also.

However, if the jet stream, which steers frontal systems, becomes bowed or moves significantly to our south while steering low pressure systems in toward us, the situation becomes bad and our weather reflects all the unpleasantness associated with warm and cold fronts.

Lows traveling from WSW to ENE bring rapidly changing conditions, with the typical textbook pre-warm front, warm sector, and cold front passages; their severity being somewhat less in the summer boating season. However, pre-cold front squall lines can be quite severe in

summer, with enormous thunderstorm lines, microburst, waterspouts, and even an occasional tornado, especially in the southern part of our boating region.

The third basic air mass system, the "Nor-Easter", requires the movement of a low up the Atlantic coast into New England which brings counter-clock wise circulation of maritime air off the Atlantic on east or northeast winds into our area. Then we get rain (or snow) in great amounts until some other system pushes the low far to the east over the Atlantic.

In general we see more continental air masses in the summer than in winter or in spring and fall transitional seasons. Also, in summer we often see lows pass to our south, resulting in drier, cooler northeast winds for a day or two.

There is another phenomenon occurring mostly in winter in our region, but sometimes in summer as well, and it is described here separately due to its unique geographic origin. This is our significant weather activity known as lake effect and it occurs east and southeast of Lakes Ontario and Erie, as well as all the other Great Lakes, for that matter. Lake effect is simply a condition of slightly drier air moving over these lakes, picking up evaporated moisture from them, transporting that moisture aloft over the nearby shore, and dumping in the form of heavy snow in winter and, to a much lesser degree, rain in summer. This phenomenon requires a west or northwest wind to transport the moisture obtained from the lakes over land, and these winds can result from several sources, mainly from post- cold front circulation, but also from cpk air masses moving slowly over the lakes. Buffalo, Rochester and Syracuse are often the victims of Lake Effect, making national headlines in the process.

V. Conditions preceding these systems

A. Prior to the arrival of a cpk air mass we typically see gradually cooling temperatures, an absence of frontal activity, fair skies, and the entrance of a large high-pressure dome. These are ideal boating conditions and are much appreciated when they arrive.

B. An mtw air mass moving up from the southwest can easily be powerful enough to generate lows in the Mississippi and Ohio basins and move them into our area as rainy wide warm fronts, followed by warm southwesterly breezes and generally good weather until the cold fronts strike with their wind shifts, storms, etc.

C. The Nor-Easter is usually preceded by southeast winds and gray skies for long periods of time, perhaps a couple of days, ever swinging to east and then northeast winds, and finally rain as the low moves on up the coast and out into the Atlantic.

VI. These systems bring:

A. Winds:

- cpk systems bring west-northwest winds of moderate speeds.

- mtw systems bring mild southwest winds, veering to strong northwest winds following cold front passages.
- "Nor-easter" systems bring steady, moderate winds as previously described.

B. Precipitation:
- cpk systems are usually quite dry, except for tail-end lake effect.
- mtw systems vary from rain preceding warm fronts, to occasional cumulus showers in the warm sectors, to heavy thunderstorms in cold front regions and finally to near zero post- front precipitation
- "Nor-easter" systems bring much rain over several hours or days.

C. Visibilities:
- cpk systems bring good visibilities.
- mtw systems bring poor pre-warm front visibilities and fog; moderate to hazy conditions in the warm sectors, and good visibilities following cold front passages.
- "Nor- easter" systems bring moderate visibilities except as reduced by rain.

D. Clouds:
- cpk systems have few and non-significant clouds
- mtw systems run the gamut of cloud types over time.
- "Nor-easter" systems bring heavy stratus and cumulostratus clouds.

E. Seas:
- cpk systems bring quite steady and moderate sea states.
- mtw systems bring a variety of sea states, ranging from flat prior to a warm front, to moderate in the warm sectors, followed by heavy and sometimes dangerous seas following cold front passages, especially in Lake Ontario and to some degree in Oneida Lake (confused wave patterns), due to the amount of fetch present with a W or WNW wind.
- "Nor-easter" systems bring steady seas of light to moderate character usually without the violent buildup associated with frontal passage. Also, steady rain helps calm the seas.

VII. Currents

Currents on Central New York waters tend to be non- existent except for a few notable exceptions. These exceptions, described below, are not weather generated but can be affected in their severity by present and past weather As Lake Erie empties into the Niagara River it builds up a current until, approaching the Falls, it is a wild thing and virtually un- navigable. This influence is seen after leaving Buffalo on the river and increases over the two branches of the river until they converge beyond Grand Island. The Niagara River north of the Falls is navigable generally from the area near Lewiston N.Y. to the lake but has a strong current all the way to Lake Ontario. Currents also exist on the Oswego River (Canal System) as it nears Lake Ontario and their effects are seasonable with greatest magnitude seen in springtime when the waters' rush

to the lake is most dramatic. Various tributaries to Lake Ontario exhibit similar currents to different degrees.

The St. Lawrence Seaway and the 1000 Islands area possess a great variety of currents due to the changing elevation of the river, especially in the narrower channels to the north of the main seaway channel. Some of these "standing" currents are formidable and can cause near loss of control of small boats in their influence.

Currents of a sort can be found in the locking areas of the state's canals, especially the Welland and to a degree, the St. Lawrence Seaway.

VIII. Tides:

There are no discernable tides in our region.

IX. Where to seek shelter during a storm:

There are so many different scenarios possible with boating in this area that no specific tips for shelter are really practical. The obvious measures given in other Power Squadron Texts apply in our region as well as in others, and should be a part of every boater's plan.

X. Sources of weather information:

Good weather forecast sources in this area:

Television:

- The Weather Channel (cable channels differ with city)
- Time Warner Local Weather, (Channel 10 in Syracuse/Utica area).
- Local network news stations.

Radio:

- NOAA Weather Radio (VHF Channel 3 and 4 in our area)
- Environment Canada Radio (VHF Channel 2 and 83)
- Govt: National Weather Service broadcasts
- FAA Wx broadcasts (requires aero VHF/UHF)