

Washington Island Weather
January 2020
A Barotropic January

With one of the mildest January's (ave. temp. 24.8°F/6th mildest) in 75 years of record just finished, it is difficult to talk about winter storms. However, we all know the reality: there are still at least two, maybe even three months of winter-like weather possible.

Even as we write this, there is another powerful storm off the coast of Alaska, which is poised to plunge through the Northwest, and into the interior West this first week in February.

Right now, thankfully, that storm is programmed to miss the Upper Great Lakes (us), and affect the Lower Great Lakes (Chicago and South). At the time of its birth, just south of the Bering Sea and the Aleutian Islands, this storm was a "baroclinic bomb" by all standards.

At Buoy #46085, some 265 miles east of the Aleutians, in the central Gulf of Alaska, the barometric pressure dropped from 1000.6mb/29.55" down to 956.6mb/28.25" in 24 hours.

That's equivalent to 44mb drop in 24 hours, or about 1.83mb per hour: well above the bomb threshold of one millibar per hour. In the icy depths of the Gulf of Alaska (12,205' deep at Buoy 46085), there are two 6-meter hulls deployed: one operational, and one spare (maybe).

Perhaps it is a testimony to the severity of the Gulf's storms. And you may be wondering at this point: what is a barotropic day (or month), and what is a baroclinic day?

Think of yourself basking in the sun, like a salamander in the Tropics: that is a *barotropic* day. Call it benign, quiet weather.

Then, think of those guys in the movie "The Guns of Navarone", as their ship is engulfed by waves and winds smashing against the rocks and 400' cliffs of the Greek Island.

That is a *baroclinic* day: you are lucky if you make it to the Island, alive. You may need to go to the Clinic.

Winter snowfall for Washington Island, as of February 6th, stands at 54.5" and we are currently in 20th place. If we look at the storms that have built-up (or saved) our snow and ice pack, there have been at least four, so far.

As reported in the December 19th issue of the Observer, the December 1st-2nd storm was another bomb cyclone that left a trail of destruction from Portland, OR to Portland, ME.

Two-day records for snowfall and precipitation were shattered with this behemoth storm. Here on this Island, the number for precipitation was 1.30" with a snowfall of 12". This was heavy-duty industrial stuff, not your typical fluffy, light, Lake Effect snow.

Some 20 miles up the waters from us, in the Town of Rapid River (by Little Bay De Noc), they received 28.2" of heavy, water-laden snow. The Cooperative Observer at that site reported it was the worst single storm he has ever measured.

Robert Cornell, our Island Electric Cooperative Manager described this storm as the worst he has seen. He and his crew (including directors) worked long hours, under extreme conditions, to restore power to numerous locations.

As we climbed the iceberg of snowfall accumulation, there were some smaller contributors. We received 6.2" between December 12th and the 15th. These squalls had some embedded mesolows that passed through, with moderate snowfall at times.

But the overall effect was minimized with lighter winds (maximum was 28 knots) and fluffier LES snowfall (snow to liquid ratio of 16:1). With the reduced character of these squalls, there were some very picturesque scenes of dancing snowflakes in the sunlit snowfall.

The last days of December ended with yet another significant storm. When you have a 500mb Closed Upper Low right on top of you, and a

Shortwave swirling 37 knot gales around you, it is the equivalent of Excedrin headache #365. The 1.32" of freezing rain (before it changed to 8" of heavy snow) did not help, either.

We limped into January with extraordinary grace, snow shovels and pick axes held high, while awaiting the next bomb. But the next storm (January 11th) was a no-show ("nary a flake").

The Island was caught between a strong Arctic High Pressure system over Northern Ontario, and another developing Shortwave across the Lower Mississippi Valley that was programmed to lift North during the day.

What happened is that the High Pressure system over Ontario shifted slightly West, and brought cold (-26 to -31°F), dry Arctic air into the advancing Lower Great Lakes Shortwave.

This cold, dry, Arctic air eroded the moisture in the deformation zone of the advancing Shortwave, at both the lower and mid-levels. The convergent Northeast flow downwind of Michipicoten Bay pushed the deformation band further Southeast.

However, the progressive (some might call it regressive) storm track from Texas through New England continued, with multiple Shortwaves lifting through the Central and Eastern USA.

Snowfall relief for snowmobilers came with storm #4 on January 18th and 19th. The Island ended up receiving another 10.4" of snow, and that was a conservative number.

Snow in the tropics of January. Which hemisphere are we in?