

## Are Recent Outbreaks of Arctic Air a Reason to Revise Genotype Specifications?

Throughout the winter of 2014 and in February of 2015, outbreaks of arctic air associated with the southward migration of the polar vortex brought lengthy periods of bitter cold to the Midwest. More persistent high amplitude jet stream configurations may be resulting from climate change, tied to the rapid warming of the arctic and the resulting decline in arctic sea ice. These same anomalous jet stream patterns were also linked to the exceptional warmth of March 2012 when high temperature records were shattered across the Great Lakes states. This increasing variability will likely continue as the jet stream adjusts to the changing climate. For restoration ecologists who have recently realigned their genotype specifications to favor more southerly origins, this variability may cause them to question these modifications. However, if one examines the temperature records, it becomes evident that recent cold outbreaks do not threaten the viability of genotypes from more southerly origins. Hardiness zones for plants are typically based on the winter minimum temperature, so examination of minimums in recent cold snaps is the best way to evaluate whether plants subject to recent genotype revisions are likely to thrive.

As an example, I will use the Chicago region as a location where many of the genotype restrictions have been recently revised. The Indianapolis area of central Indiana would be near the southern limit of the acceptable genotypes if the typical 150-200 mile radius were used. By examining the temperature records during these recent arctic outbreaks, it can be shown that relatively few actual daily record lows were set and even those new records were well within the range of historical extremes from areas at the southern limit of the revised genotype restrictions. For example, the only daily record low that was set in Chicago during the winters of 2013-2014 and 2014-2015 which was -16 F on January 6, 2014. This is not even close to all-time record low in Indianapolis of -27 F. In fact there are twelve daily record lows of -20F or below in the Indianapolis weather records, so the notion that plants originating from central Indiana are would not be able to tolerate recent cold winters is obviously erroneous.

Climate change will likely continue to cause considerable variability in our weather due to shifting circulation patterns. However, as the background temperature of the earth continues to warm, the growing season will lengthen and the cold extremes will become less cold making the revised genotype restrictions favoring southerly origins entirely appropriate.

### PLANT FEATURE – JUSTICIA AMERICANA (WATER WILLOW)

This unique member of our flora is a common denizen of sand and gravel bars in rivers and large streams. It occurs in the mid Mississippi and Ohio Valleys north to the southern edge of the Great Lakes. It typically grows to about 18 inches in height, spreading rapidly by stolons to form large colonies in favorable habitats. Small but beautiful orchid-like flowers adorn the plants in mid summer. Its riverbank habitat makes it extremely tolerant of flooding. The tenacious root system allows it to thrive in areas subject to powerful currents during high water events.

Due to its specialized habitat, Water Willow often grows without associates, however it occasionally mingles with [Lizard's Tail \(\*Saururus cernuus\*\)](#) and [Riverbank Tussock Sedge \(\*Carex emoryi\*\)](#) along the edges of rivers. Its tenacious roots, tolerance of flowing water, and unpalatability to muskrats makes it an ideal plant for the water's edge in stream relocations and river bank stabilizations.

