A Climatology of Superrefractive Conditions for Assessing Wind Farm Impacts on Radars
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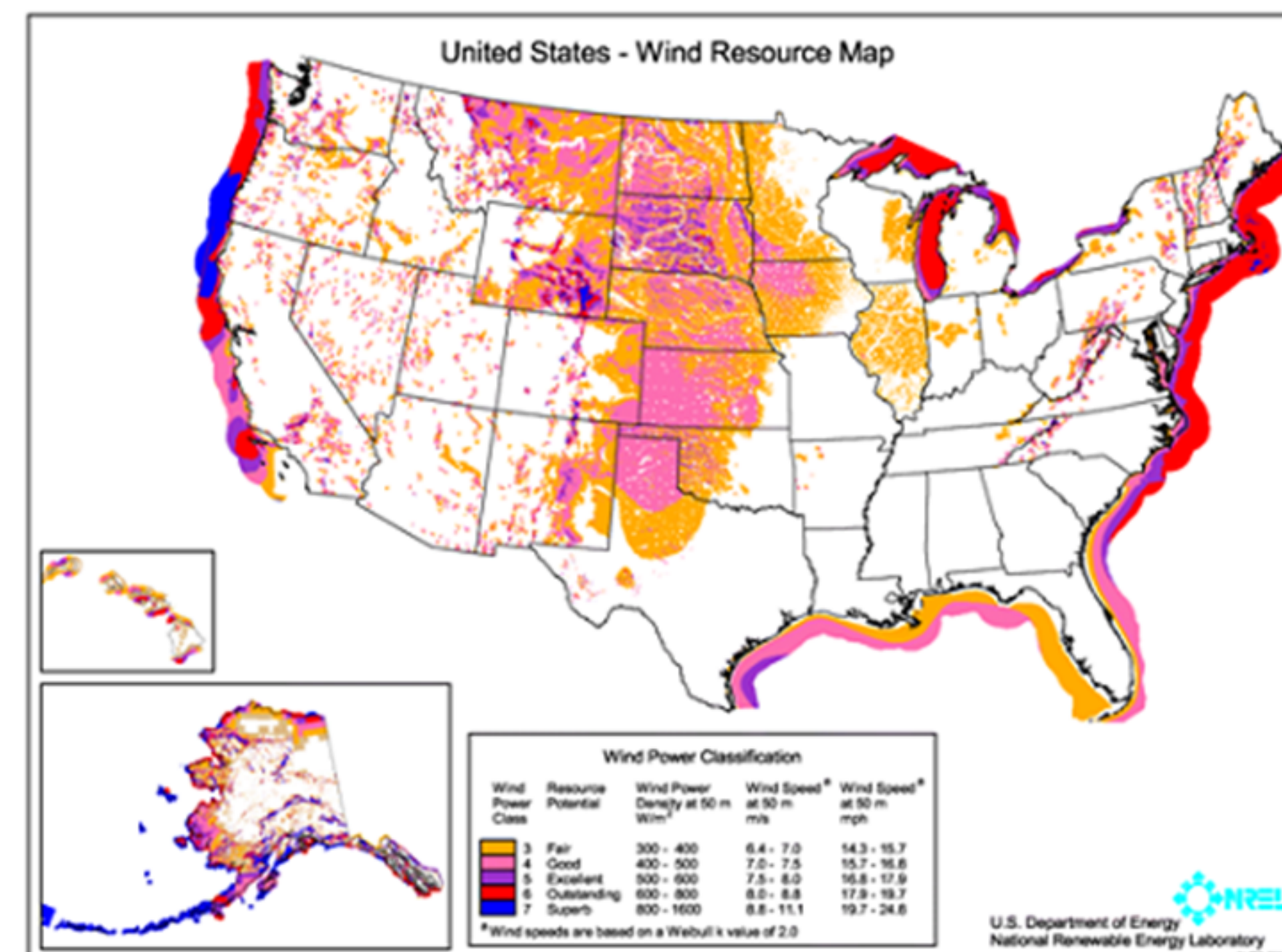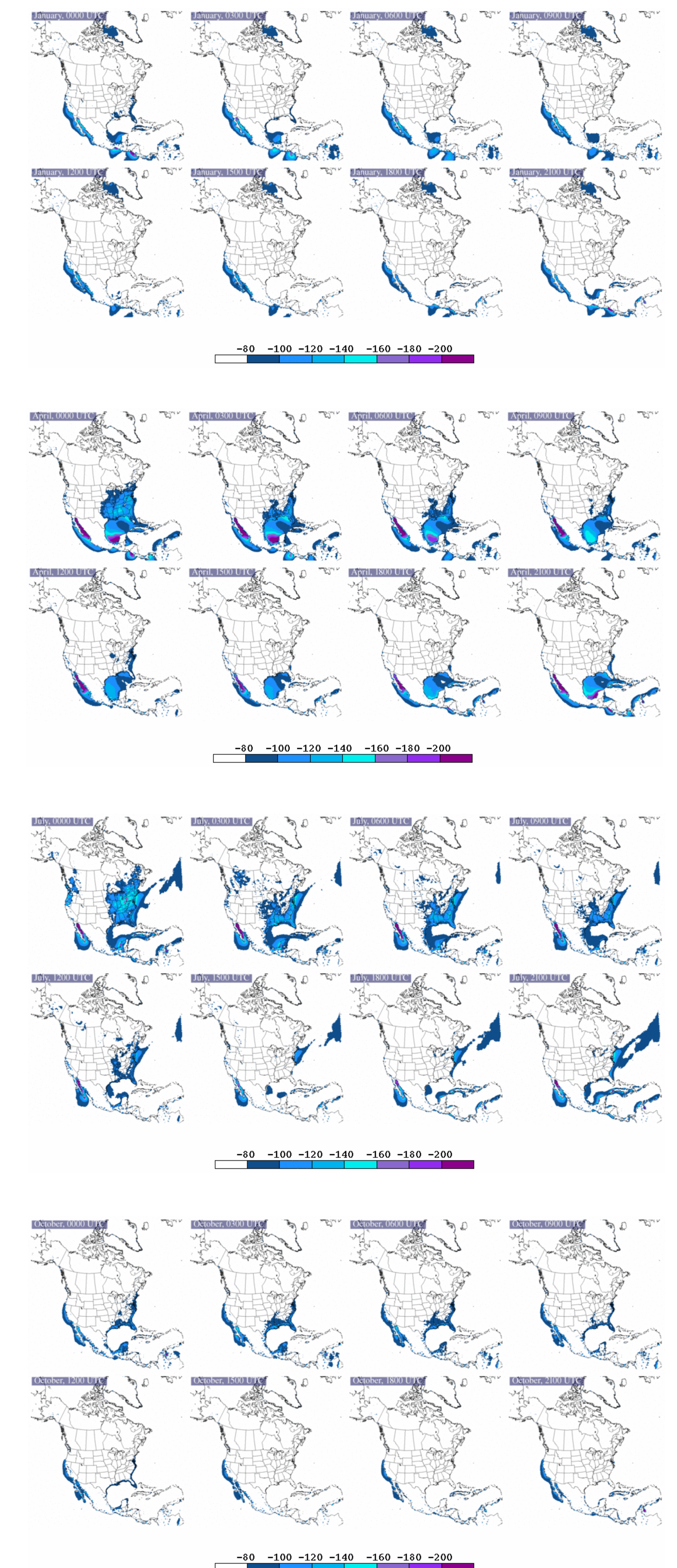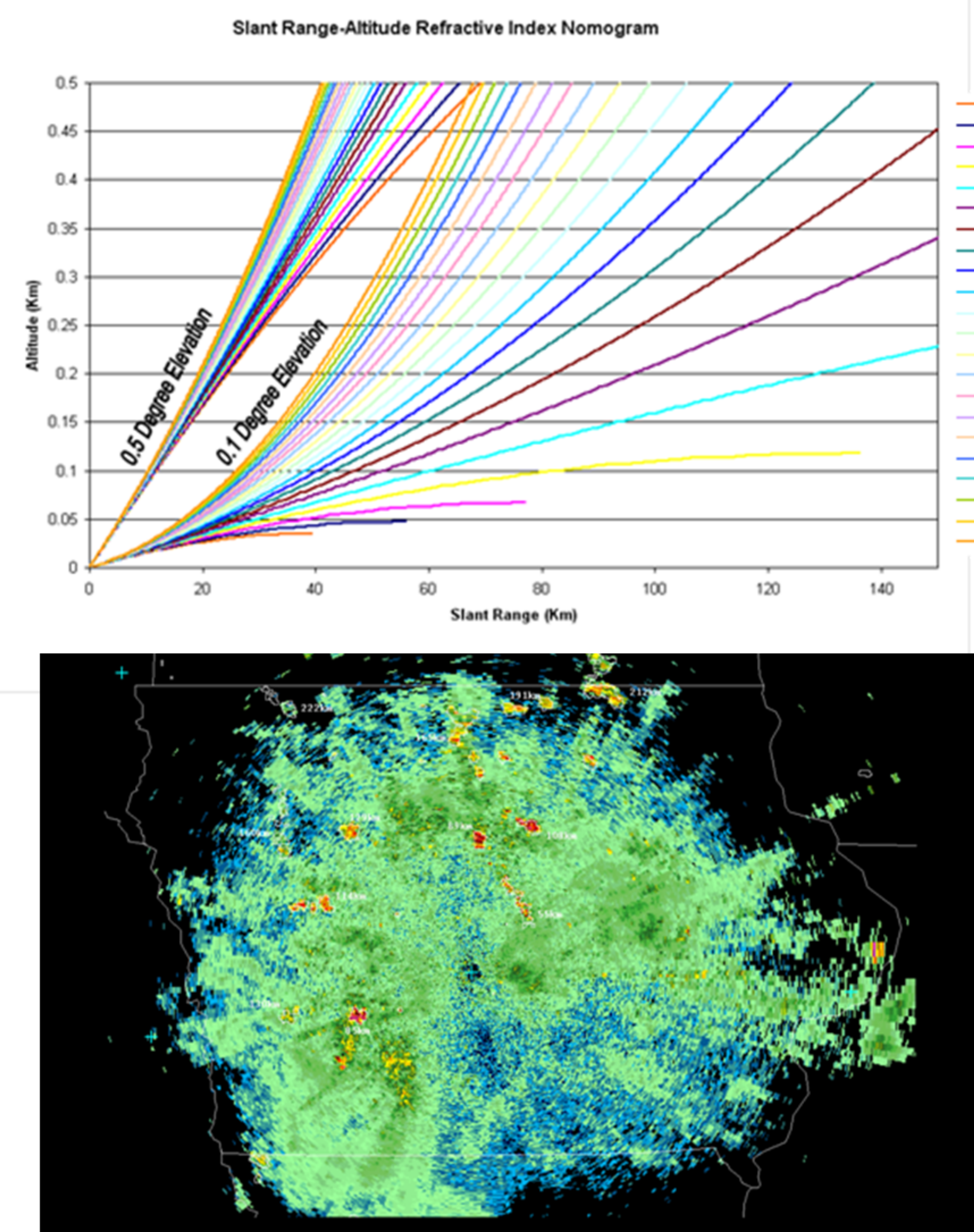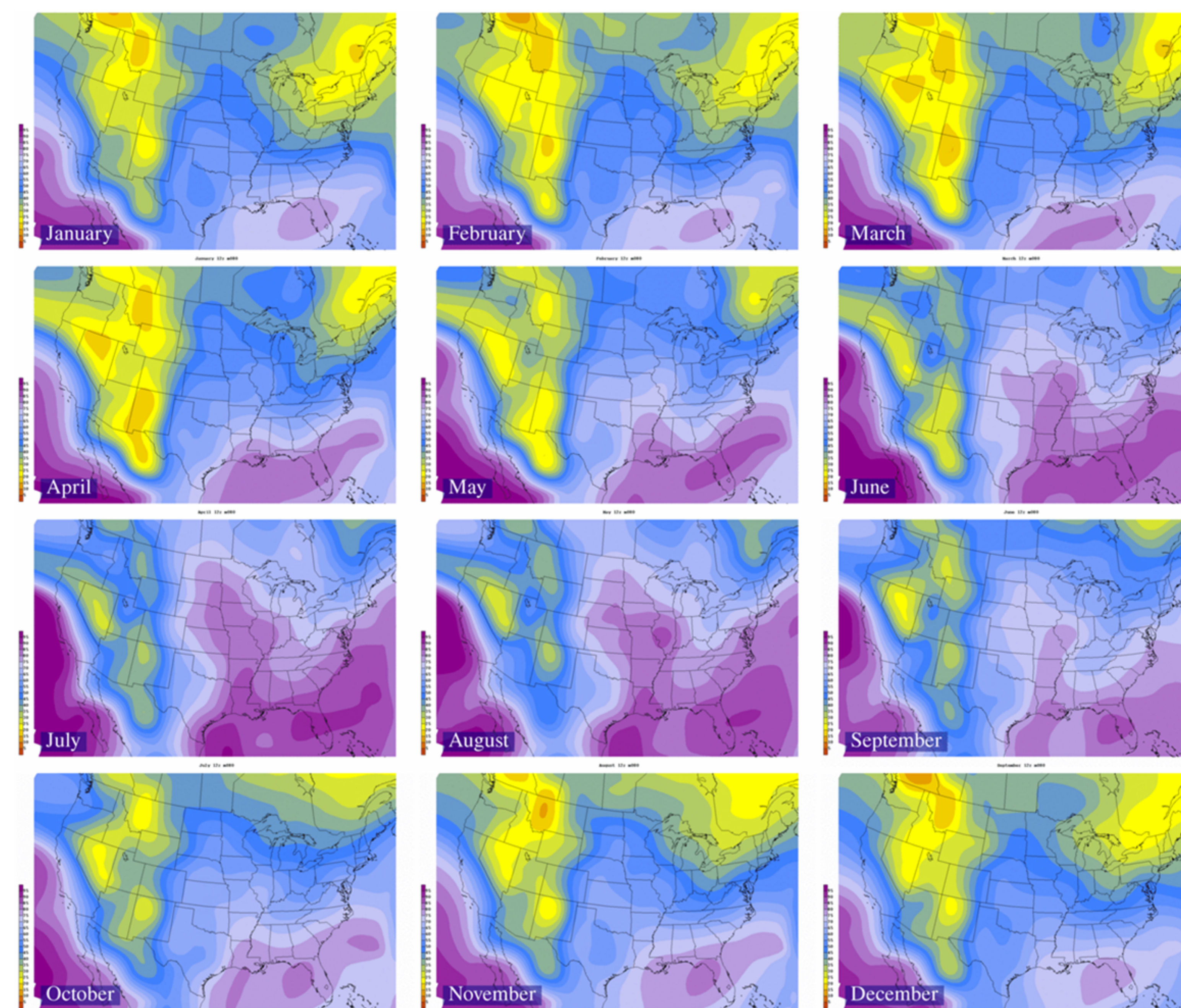Slant Range-Altitude Refractive Index Nomogram

At present, many of the wind farm installations within the United States are in areas with climatologically low moisture and therefore relatively low atmospheric refractivity gradients, but an increased interest is being placed on coastal and border locations where additional wind power capacity exists and the standard atmosphere approximation is not well suited.

United States - Wind Resource Map

Above - Des Moines, IA Radar reflectivitity showing impact of wind turbines on 27 April, 2011 1200 UTC.
Below - Modeled Radar beam elevation above ground for a -40 km⁻¹ b) -80 km⁻¹ c) -120 km⁻¹ d) -140 km⁻¹ with existing wind farm regions (orange polygons).

Monthly Probability of Superrefractive Conditions from NDCD/IGRA Radiosonde Archive

Climatology of Superrefractivity Derived from North American Region Reanalysis (NARR)