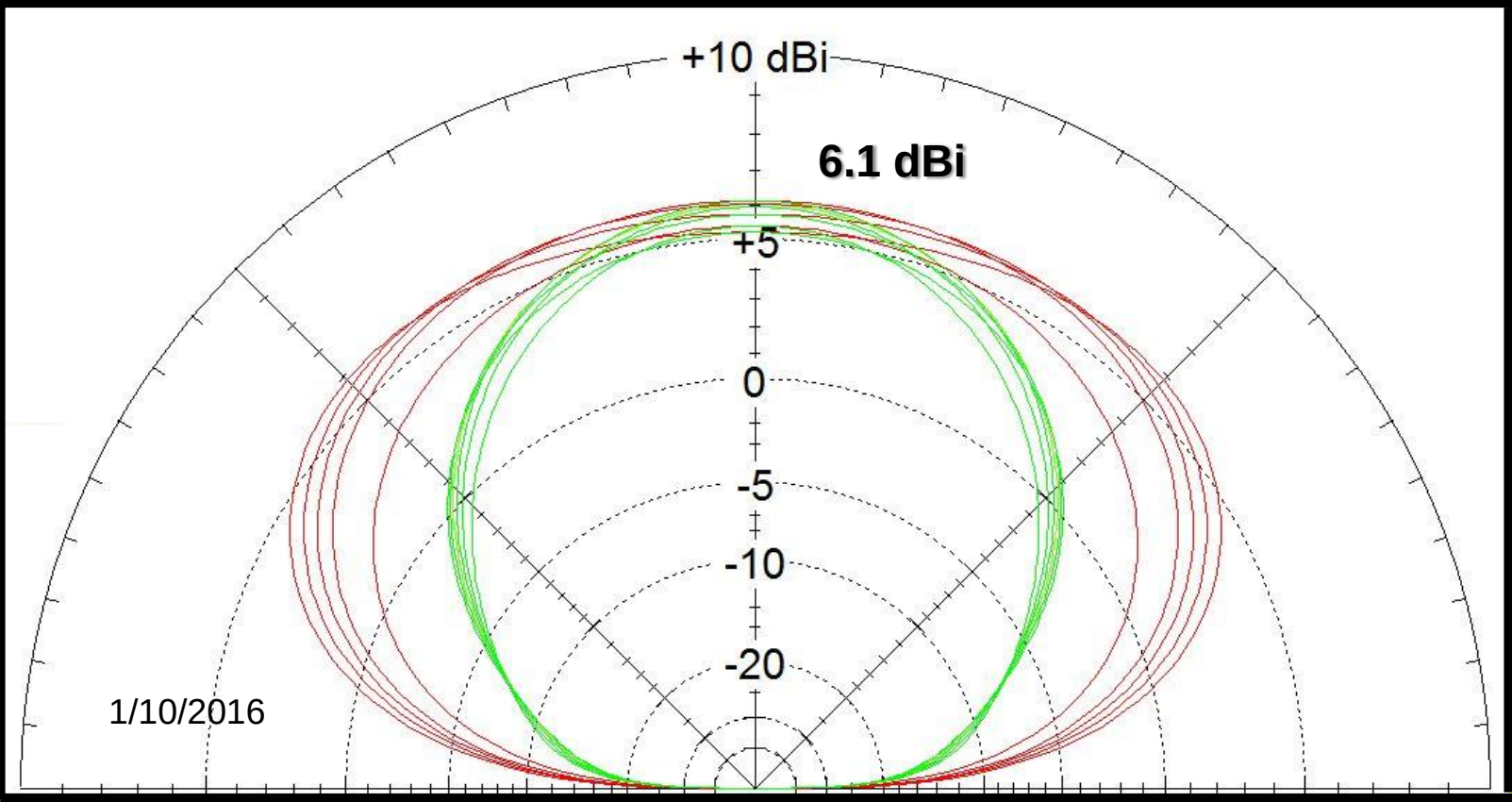
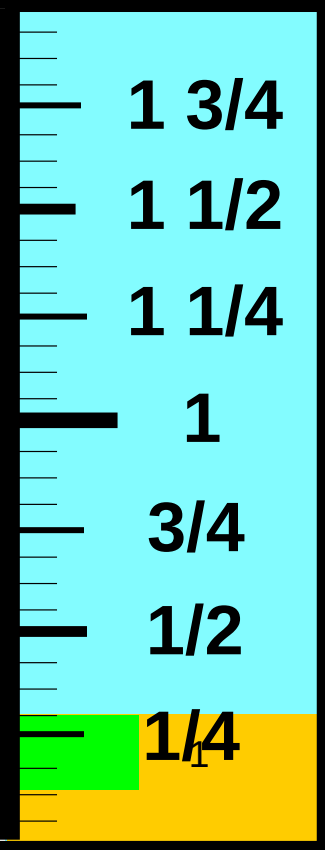
Radiation Pattern

Cloud Warmer or NVIS Antenna Height

Band	160	80	60	40	30	20	17	15	12	10
Max.	146	74	51	39	27	19	15	13	11	9
Min.	65	33	23	17	12	9	7	6	5	4

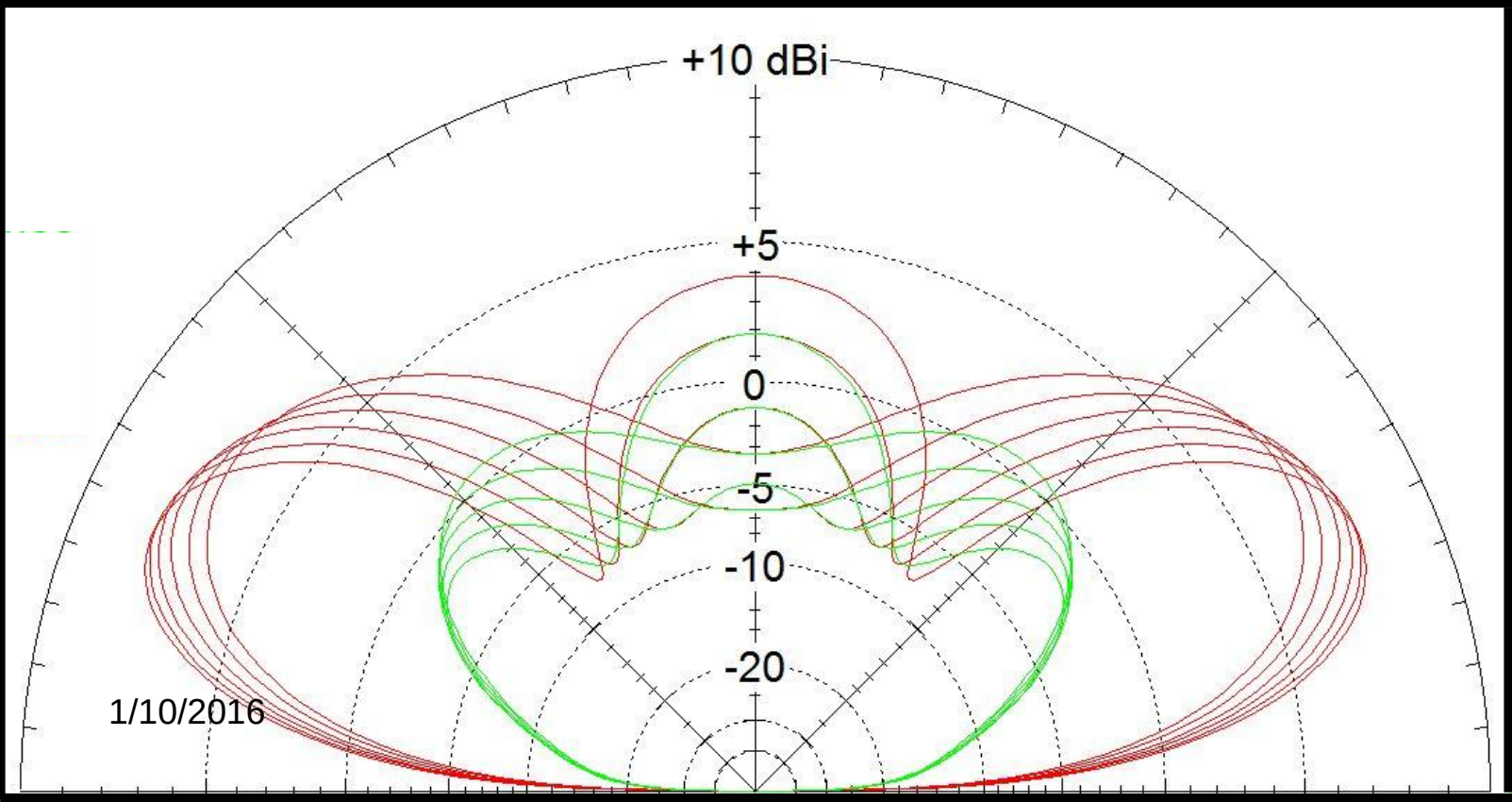


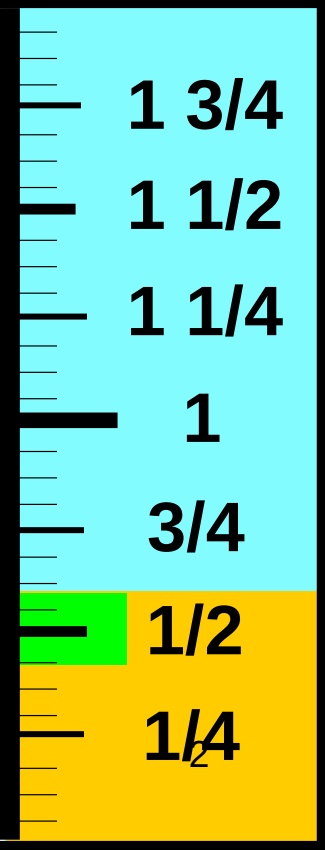


Radiation Pattern

Maximum to the Horizon

Band	160	80	60	40	30	20	17	15	12	10
Max. Rad.	308	156	109	81	58	41	32	27	23	20
Min. Ht	227	115	80	60	42	30	24	20	17	15





Antenna General Rules of Thumb

- Higher is not necessarily better, one should choose height for NVIS near ¼ λ or Maximum Gain near ½ λ.
- The type of ground below the antenna and at the reflection point effects performance with salt water being better and poorer for rocky ground.
- As frequency is increased the ground reflection is more dependent on the type of ground for all antennas.
- There is not much change from band to band when height is measured in wavelengths on how the ground effects the antenna pattern.
- The middle 50% of a dipole has the biggest influence on e gain and pattern allowing the ends to be bent.
- Bending the ends of a dipole lowers the impedance at resonance.
- When cutting wire remember that traditional dipole length formula of $468/f$ MHz can be off by as much as 8%.
- All antennas types are influenced by ground reflections in the same way.