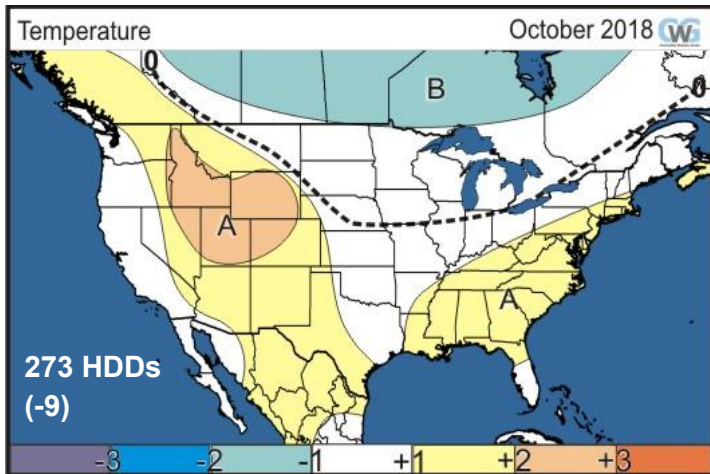


October Trends Warmer; Slightly Colder November: Winter Unchanged

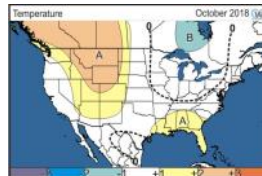
October 2018



Near Normal October Demand

- 273 Gas weighted HDDs (-9)
- Slightly warmer East
- Strongest warmth remains over the Interior West with strongest cold locked in Canada
- Analogs range from 200 to mid 300 HDDs

Prior Forecast

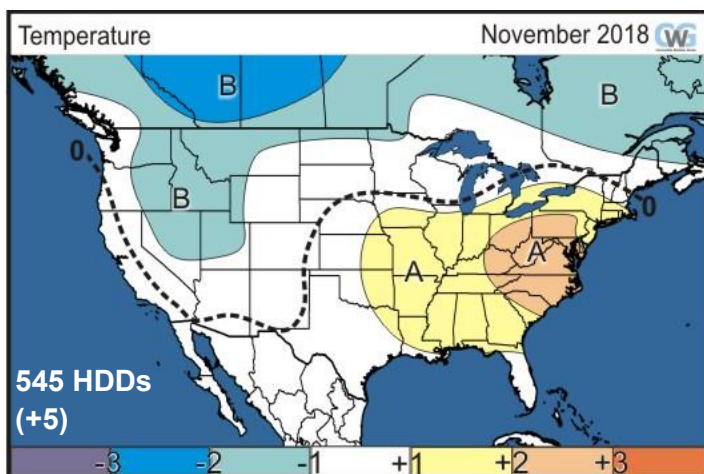


Preferred Analog Blend

**2016, 2002, 2015,
2009, 1999, 2017,
1993, 2001**

Note: No two years exactly same, but this analog blend has more similarities to CWG outlook than others

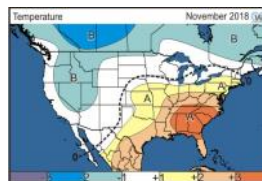
November 2018



November Slightly Colder

- 545 HDDs (+5)
- Not as warm Southeast/Texas, slightly warmer California
- Warmer than 30-year, colder than 10-year

Prior Forecast

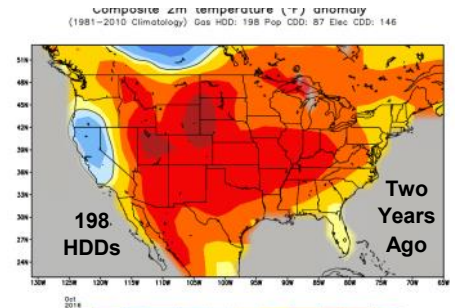
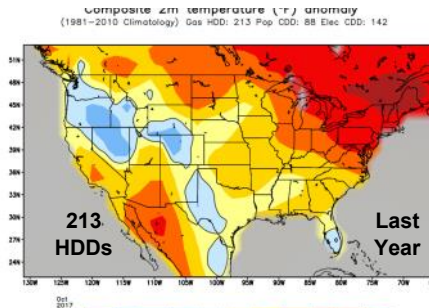
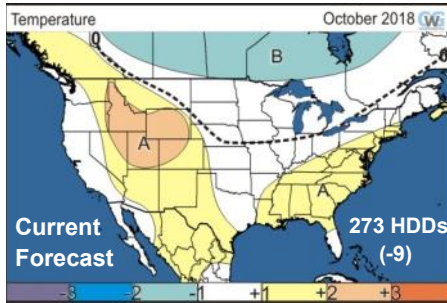


Preferred Analog Blend

**2014, 2004, 1994,
2009, 2006, 2002**

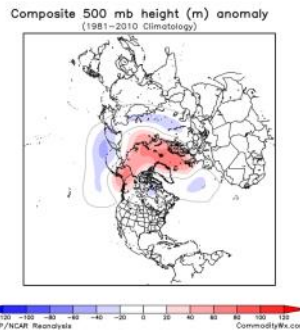
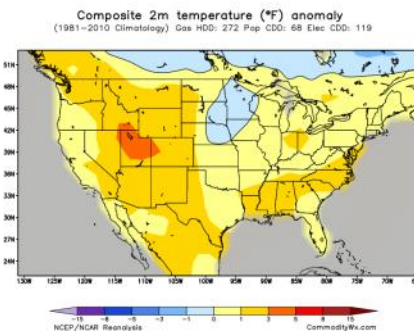
Note: No two years exactly same, but this analog blend has more similarities to CWG outlook than others

Monthly Outlook

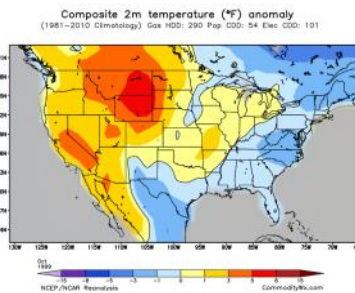
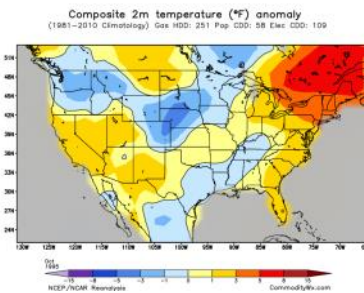


Primary Rationale and Expectations

Preferred Analogs



Preferred Risk Range

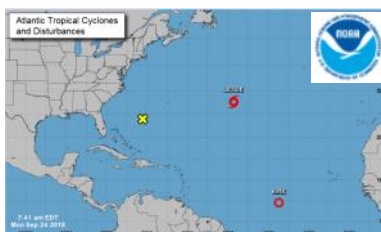


- Forecast moves slightly warmer across the East (current HDD total between the 10 and 30 yr norms, 252-292); coldest Oct since 2013
- Cool Mid Continent, warm South and East early month; cooling more Midwest focused mid month
- Risk range remains large depending on how much cooling can reach the East (~250-300 HDDs)
- Persistent Alaska ridge should help send colder air into Midwest/East at times but SE sub-tropic ridge will work against
- More negative NAO would help send cold farther South/East
- CFS Monthly leans a bit colder mid con to Northeast; CFS and Euro Weeklies also colder mid to late month
- Global Wind/MJO progression remain wildcards
- Dry conditions out West could aid stronger heat there

Atlantic Hurricane Season



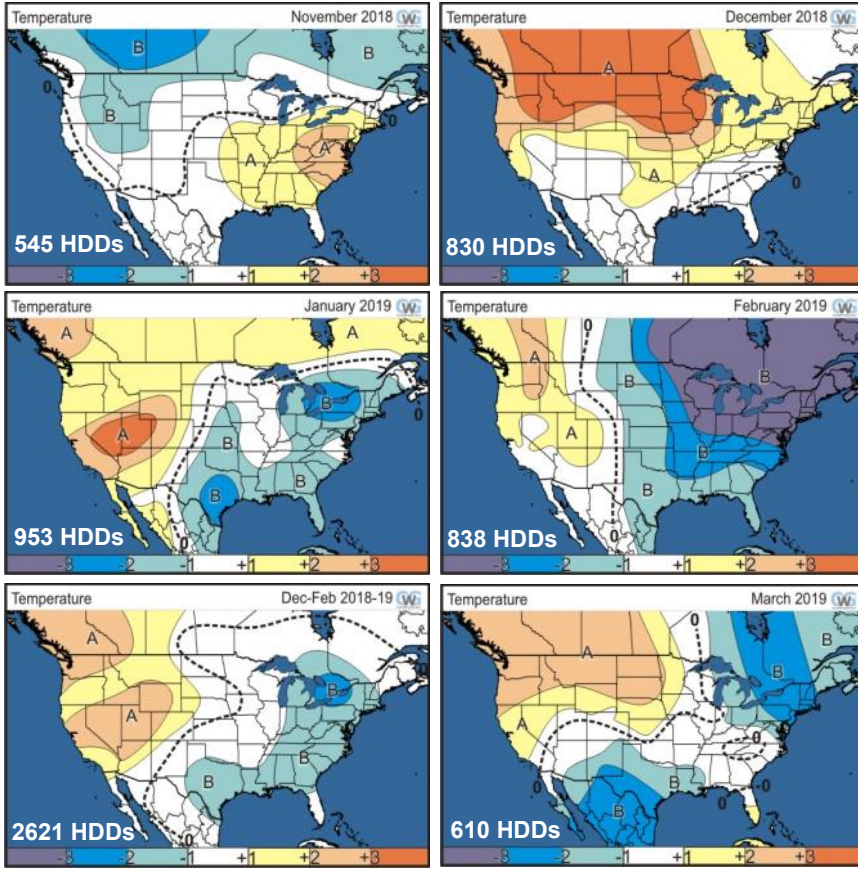
Official CWG 2018 Atlantic Hurricane Forecast
15 Named Storms (+3)
6 Hurricanes (+1)
2 Major Hurricanes (NC)



- Atlantic storm count is currently at 12 named storms, 5 hurricanes, and 1 major hurricane; increased our forecast due to more active season than expected thus far
- Slower El Niño transitions and warmer waters in the Atlantic basin have likely allowed for elevated storm numbers so far; Leslie (no threat to land) and Kirk (expected to strengthen to a tropical storm as it moves west) are the current Atlantic storms

Monthly Outlooks

Heating Season Outlook



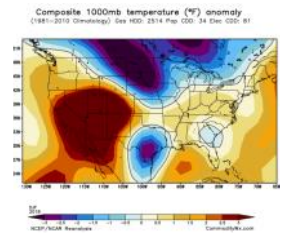
Primary Rationale and Expectations

- **545 HDD November (+5)** now 14 warmer than the 30-year normal; warmth focused more in the Mid-Atlantic; not as warm Southeast/Texas
- **December** warmth to start off the winter (**830 HDDs** vs. 867 HDDs for the 30-year); warmth stretches across the N. tier into Northeast; risks lean to the warmer side
- **January** features cold in the East and South; warmth in the West; **953 HDDs** is 1 colder than 30-year normal
- **February** is still the favored coldest month of winter with risks even colder per some analogs (but would likely need help from solar minimum/blocking); **838 HDDs** is 65 colder than the 30-year
- **Winter** (Dec-Feb) composite HDD total of **2621** is colder than 30-year normal (2592), would gain **107 HDDs** vs. last winter
- Similar +ENSO years with maintained warmth in NE Pacific favor warm start, cold finish to winter; El Niño has been slow to develop thus far but should still warm into weak range in time for autumn/winter
- **Warmer risks** if blocking fails to materialize and/or strong Pacific jet materializes; 1994-95, 2004-05 and 2006-07 are weak-moderate El Niño cases that were warmer; risk exists for El Niño to fail but failure does not necessarily equal warmer risks

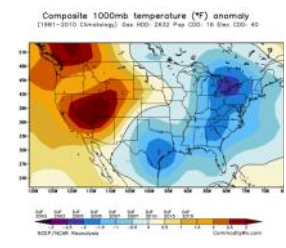
National Natural Gas Weighted Heating Degree Days					
	2018-19	Change	Last Year	10-Year	30-Year
Overall	3776	25	3690	3681	3773
Dec-Feb	2621	-	2514	2549	2592
November	545	5	524	541	559
December	830	-	880	839	867
January	953	-	944	936	952
February	838	-	690	774	773
March	610	20	652	591	622

Winter 2017-18 vs. 2018-19

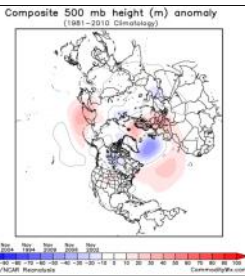
2017-18
2514 HDDs



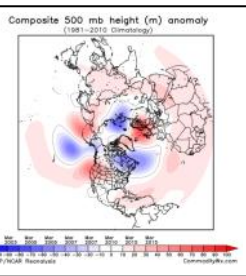
2018-19 Forecast
2621 HDDs



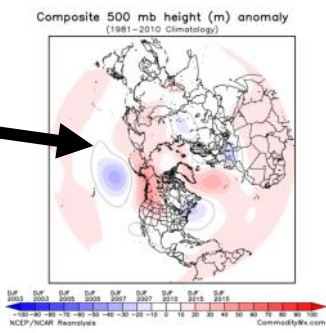
Best Analog Nov. Upper-Level Pattern



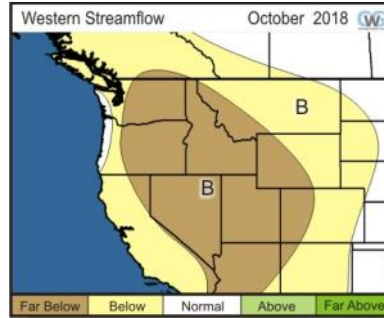
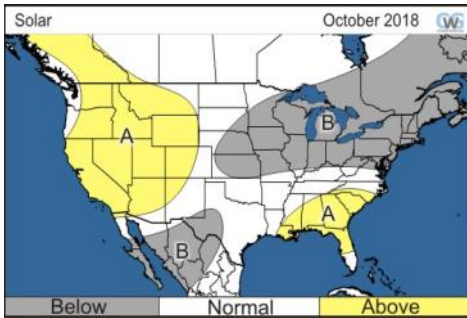
Best Analog Mar. Upper-Level Pattern



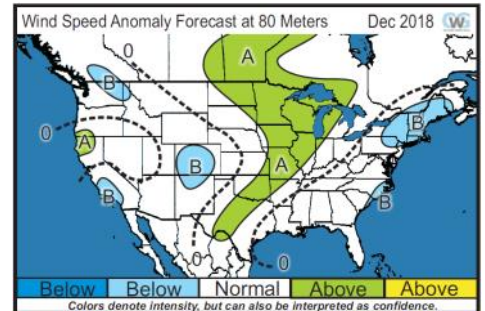
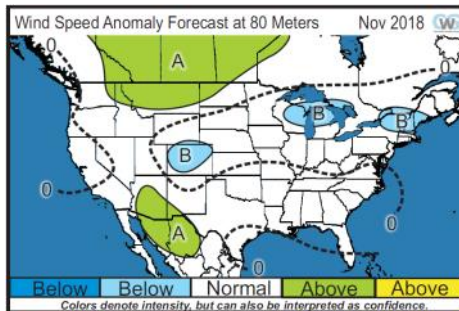
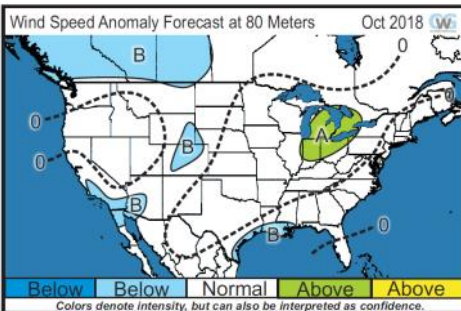
Analog Winter Upper-level Pattern



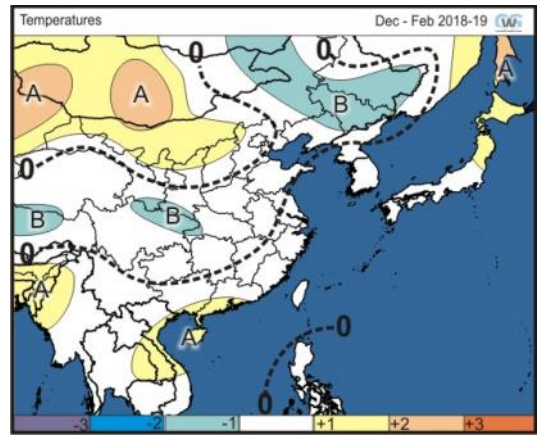
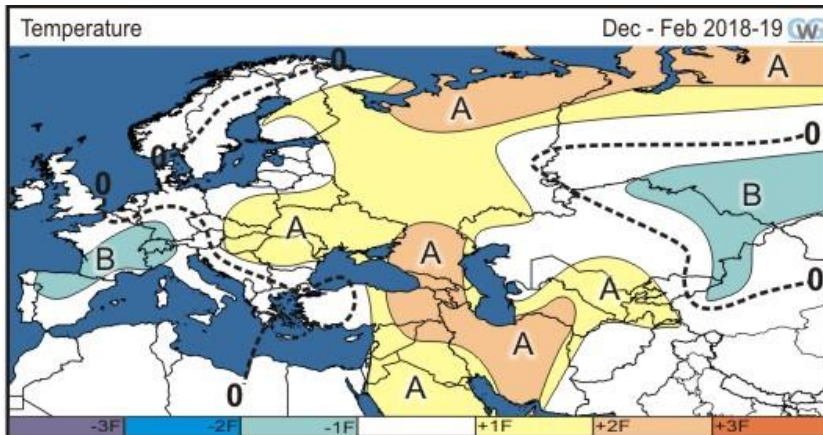
Renewables



- While some precipitation is possible in the northwest, a mostly dry situation keeps streamflow well below normal.
- Variable wind anomalies the next three months. In ERCOT, winds are generally forecast normal to slightly above normal.



International



- Slightly colder than normal for parts of Western and Central Europe, mainly mid to late winter; warmer lean for E Europe/Russia
- Colder risk if SSTs cool off in the Western Atlantic
- Forecast holds with a colder than normal look overall, but coldest conditions mid to late winter; Dec. warmer than normal
- Main risk is to colder side for Asia if warm pool in NW Pacific holds strong or intensifies and ENSO remains neutral positive