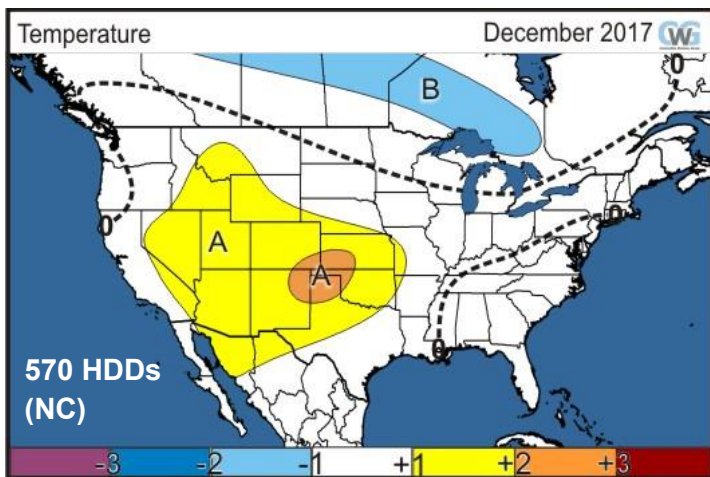


**Slightly Warmer December/Colder January; Winter Leans Just Colder than 30Y**

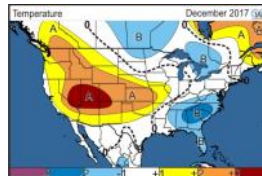
## December 2017



### December Warms Slightly

- 880 HDDs (-10); slightly colder than last year
- Warmer Southeast; weaker warmth across the West
- Top analogs range from upper 700 to lower 900 HDDs so risk range remains large and confidence remains low

### Prior Forecast

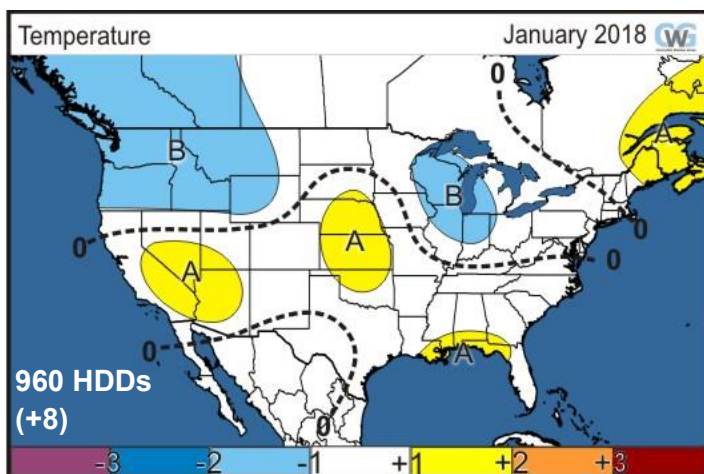


### Preferred Analog Blend

**1965, 1998, 1973,  
1996, 2005, 1985,  
2010, 1981**

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

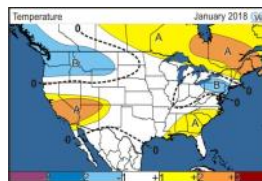
## January 2018



### January Marginally Colder

- 960 HDDs (+8)
- Colder Midwest, Warmer Mid-Continent
- Slightly colder than 30Y

### Prior Forecast

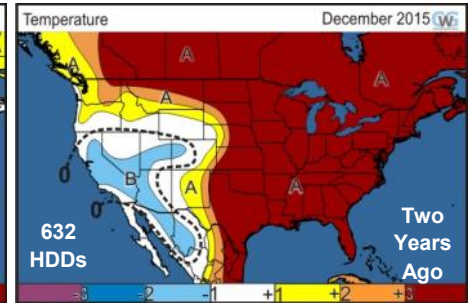
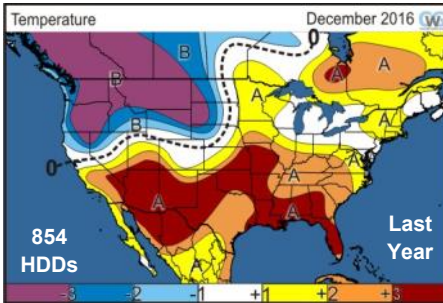
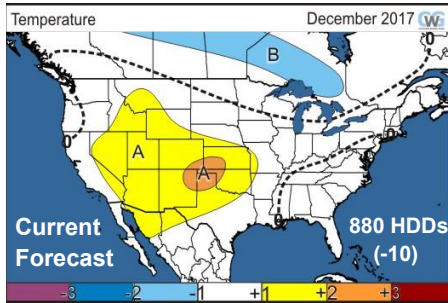


### Preferred Analog Blend

**Multiple**

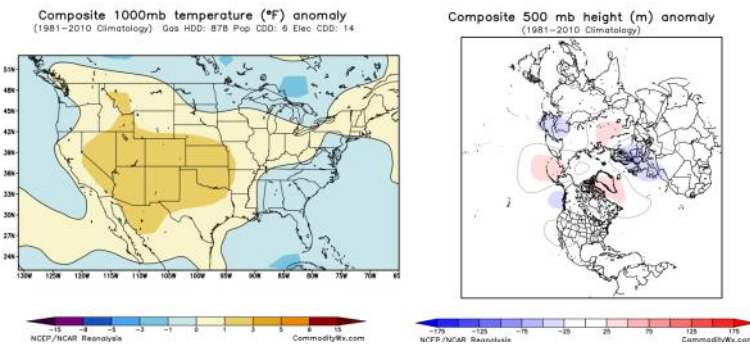
Note: No two years exactly same, but this analog blend has more similarities to CWG outlook than others

## Monthly Outlook

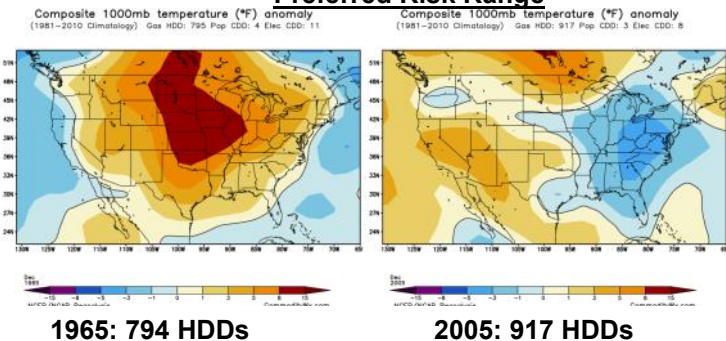


## Primary Rationale and Expectations

### Preferred Analogs

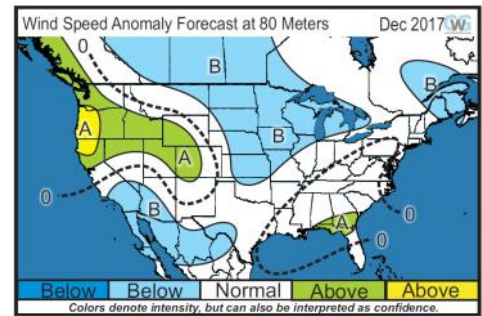
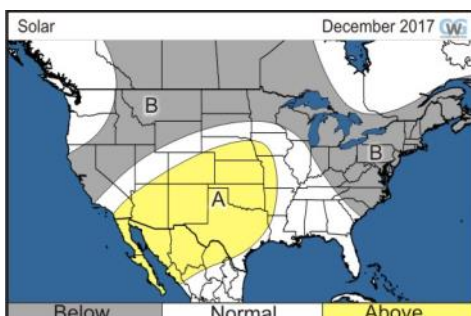


### Preferred Risk Range



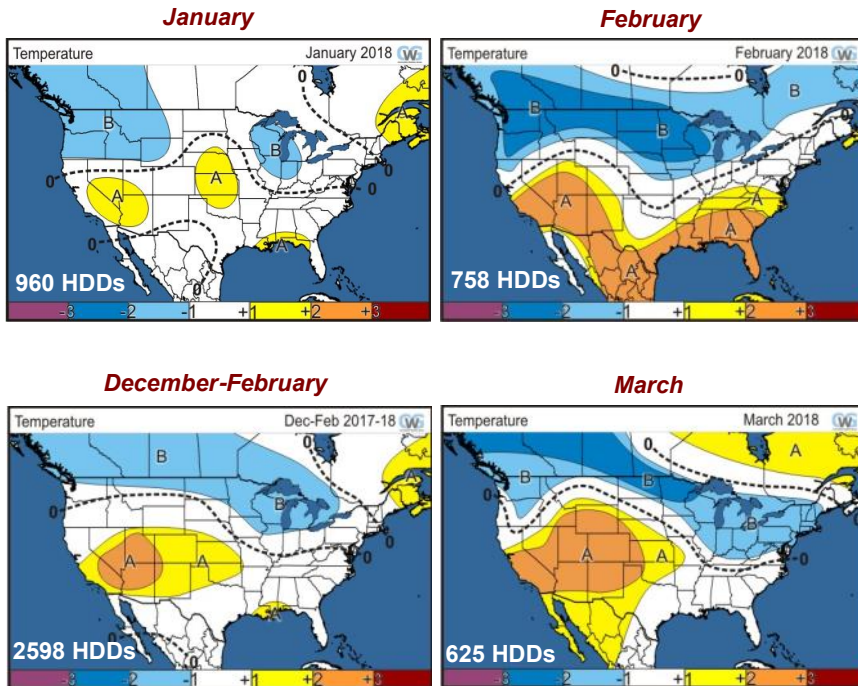
- Forecast warms to 880 HDDs (-10); colder than last year and both 10 (837) and 30 year (867) normals
- Near normal to slightly warmer than normal start to month for Midwest, East, and South
- Best chance for sustained warmth remains across West
- Analogs favor battle between +EPO (warm signal) and -NAO (cold signal); offering plenty of variability
- CFS remains warmer coast to coast; Euro Weeklies close to this look
- Best chance for warmer surprise Plains to Western Midwest; colder potential Southeast to Mid-Atlantic
- Cold air expected to rebuild in Canada offering cold source region for potential cold shots into Midwest and East mid month; sustained cold seems unlikely however

## Renewables



## Monthly Outlooks

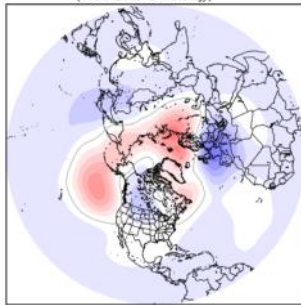
### Primary Rationale and Expectations



- **January** trended slightly colder (+8 HDDs) across Midwest; warmest anomalies Southwest, Mid-Continent, Southeast (8 national HDDs colder than 30-year normal)
- **February** remains unchanged at 758 HDDs (15 warmer than the 30-year normal); warm South, cold north La Niña-type pattern
- **Winter** (Dec-Feb) composite HDD total of 2598 (-2) colder than 30-year normal (2592), but still gains 340 HDDs vs. last winter (+15%)
- **March** unchanged; just barely colder than 30-year normal; warmth persists Southwest; colder Midwest/Northeast
- **Colder risks** include moderate La Niña (stronger than expectations) as well as potential blocking from partial solar minimum onset; weaker La Niña years (favored scenario) much more mixed
- **Warmer risks** still mainly hinge on suppressed Dateline precipitation (inhibiting cooler MJO phases) and/or unexpected stronger -PDO development/Pac jet; CFS model remains very warm for winter as a whole
- **MIXED WINTER STORY FAVORED:** While this winter looks to gain significant demand compared to the last two winters, we do not favor cold to "lock in". Most likely solutions includes both colder and warmer weeks with transient pattern.

### January Upper-Air

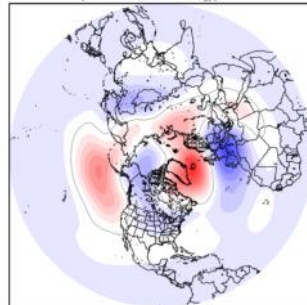
Composite 500 mb height (m) anomaly (1981-2010 Climatology)



NCEP/NCAR Reanalysis

### February Upper-Air

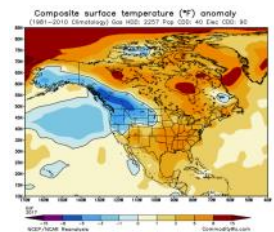
Composite 500 mb height (m) anomaly (1981-2010 Climatology)



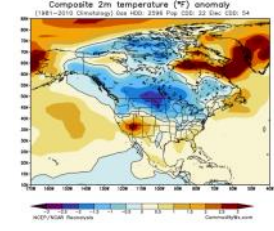
NCEP/NCAR Reanalysis

### Winter 2016-17 vs. 2017-18

2016-17  
2258 HDDs



2017-18 Forecast  
2598 HDDs



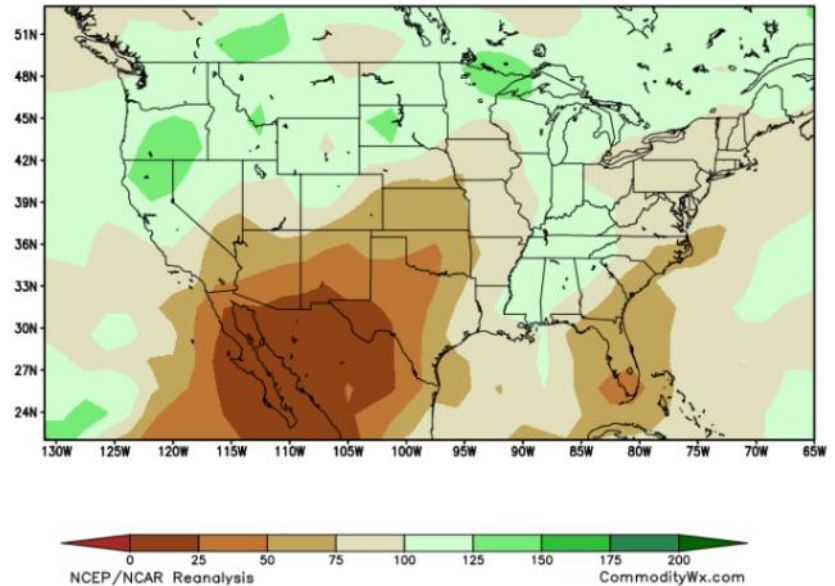
National Natural Gas Weighted Heating Degree Days						
	2017-18	Change	Last Year	5-Year	10-Year	30-Year
Overall	3771	-	3285	3661	3717	3773
Dec-Feb	2598	-	2258	2493	2588	2592
November	548	-	440	545	543	559
December	880	-10	854	784	837	867
January	960	8	822	928	943	952
February	758	-	582	781	808	773
March	625	-	587	623	586	622

## Pacific NW Hydro

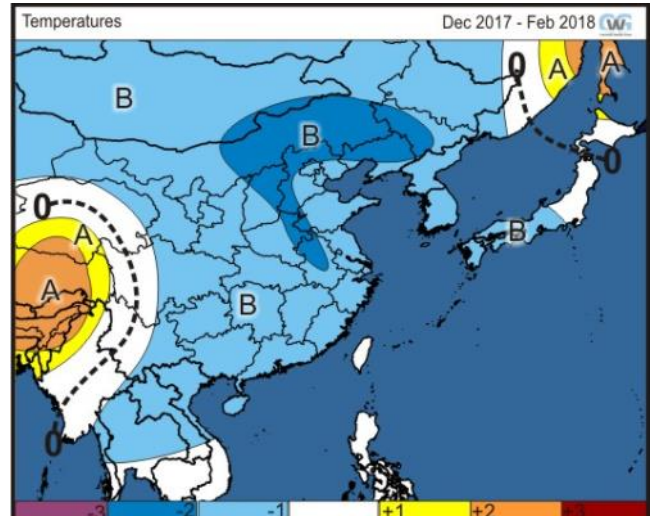
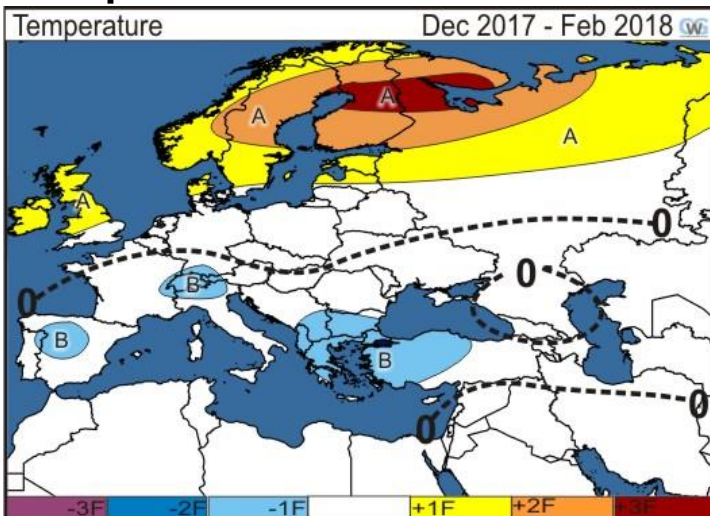
- No major changes with analogs still pointing toward wetter than normal winter for Pac NW (and even into northern California)
- CWG forecast still favors front-loaded winter with wettest conditions through January before turning little drier in February and March
- Long range guidance offers some variation on timing as European monthlies from earlier this month suggesting drier December and wetter Jan-March while CFS suggests more persistent wet pattern through winter

Composite precipitation rate: % of normal  
(1981–2010 Climatology)

### December to March



## European and Asian Winter Outlook



- Europe: Flat to slightly warmer vs. prior outlook—but still coldest winter potential since 2012-13
- Return of cold pool would increase cold risks, otherwise, risks lean warmer still
- Asia: Colder flip in winter outlook for much of eastern Asia— warm pool in west N. Pacific disappears to support colder view now