

Long Range Forecast 2018: Drought, Deluge, or “Normal”?



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Current Status

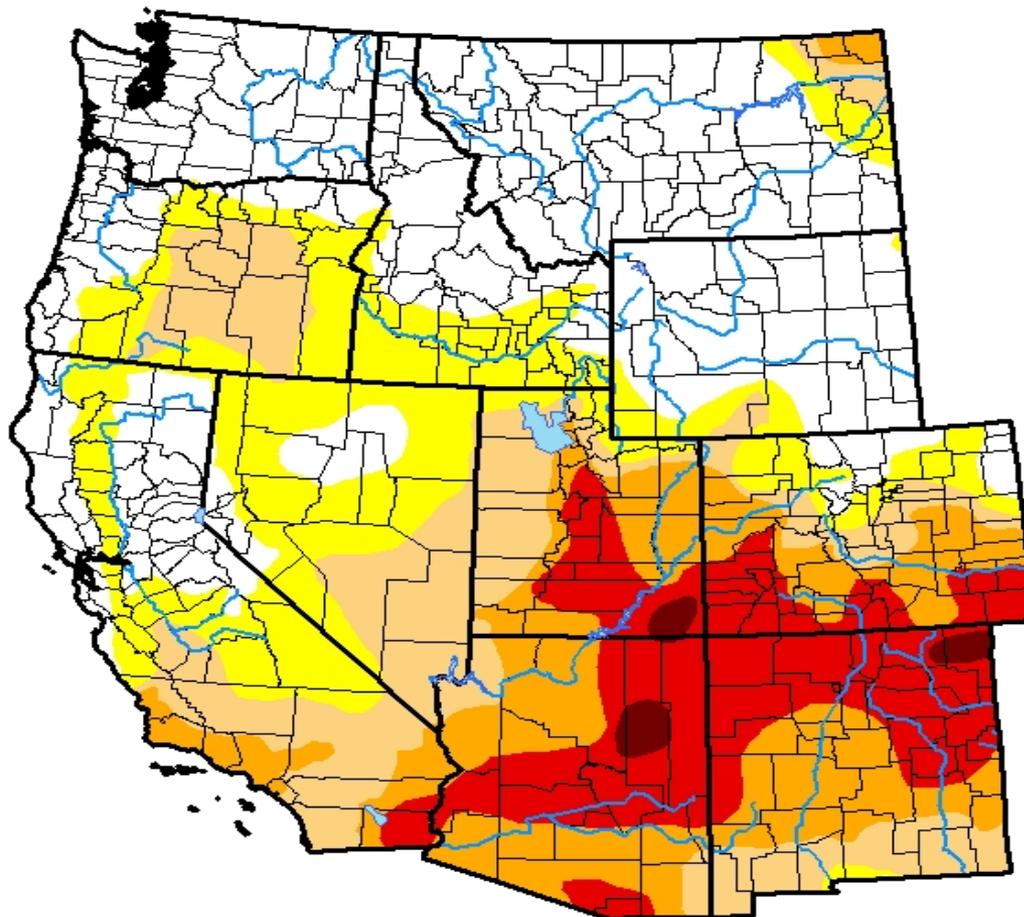


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Drought Worst in “Four Corners” States

U.S. Drought Monitor West

April 10, 2018
(Released Thursday, Apr. 12, 2018)
Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Moderate Drought
-  D2 Severe Drought
-  D3 Extreme Drought
-  D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

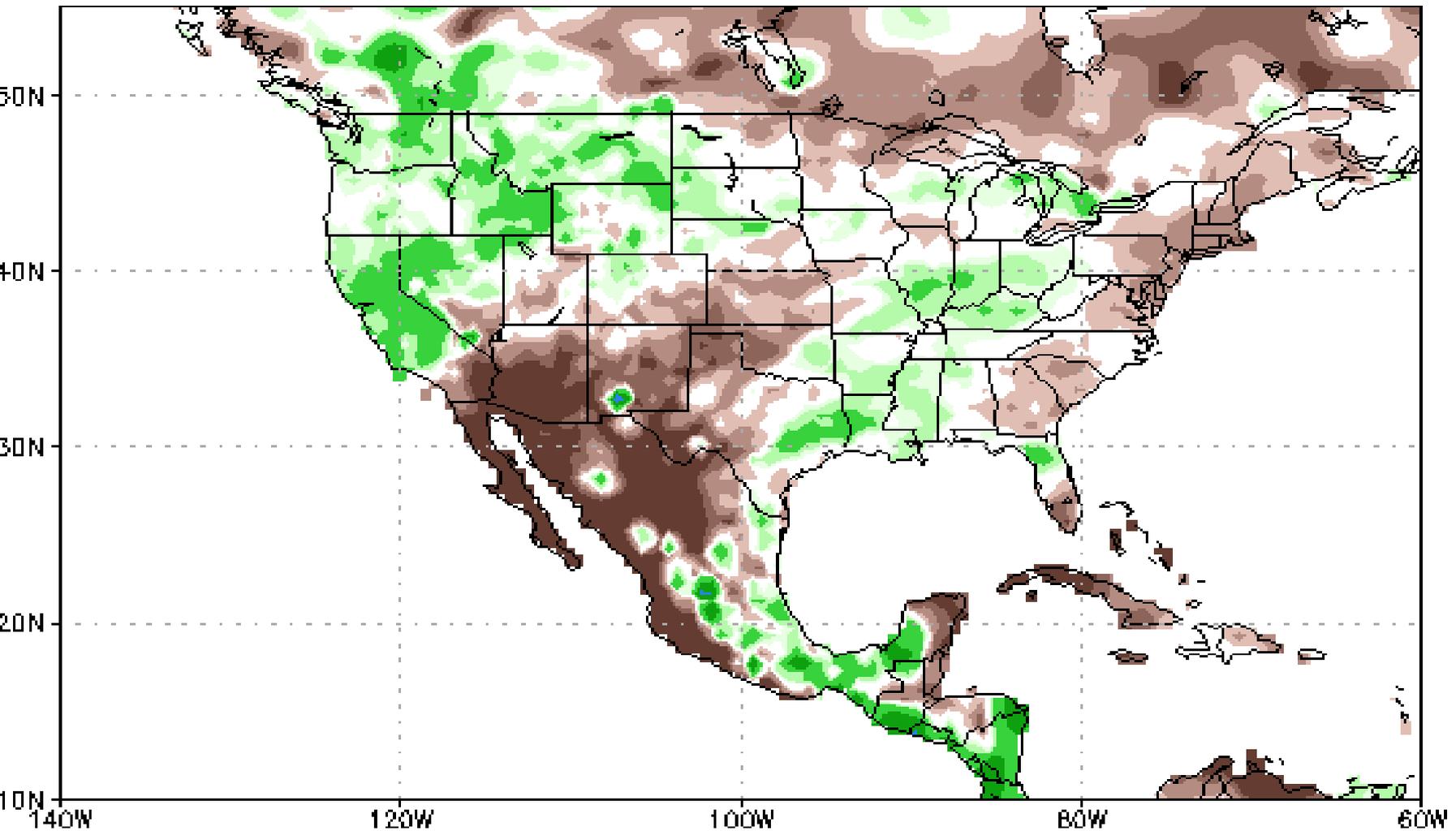
David Miskus
NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

Precipitation % of "Normal" Past 30 Days

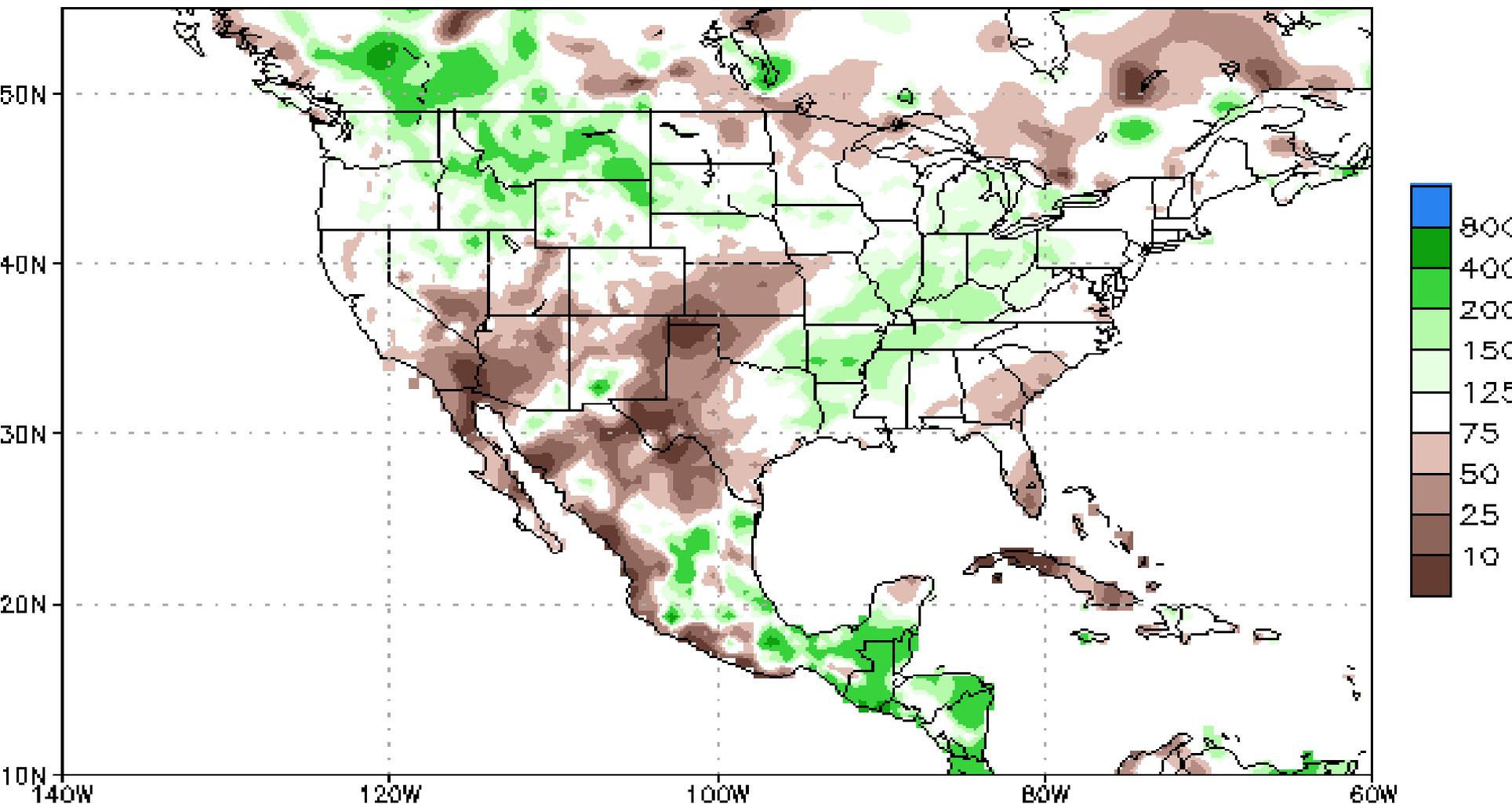
30-day Accumulated Prep % of Normal 17MAR2018-15APR2018



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)

Precipitation % of "Normal" Past 90 Days

90-day Accumulated Prop % of Normal 16JAN2018-15APR2018



Data Source: CPC Unified (gauge-based & 0.5x0.5 deg resolution) Precipitation Analysis Climatology (1981-2010)

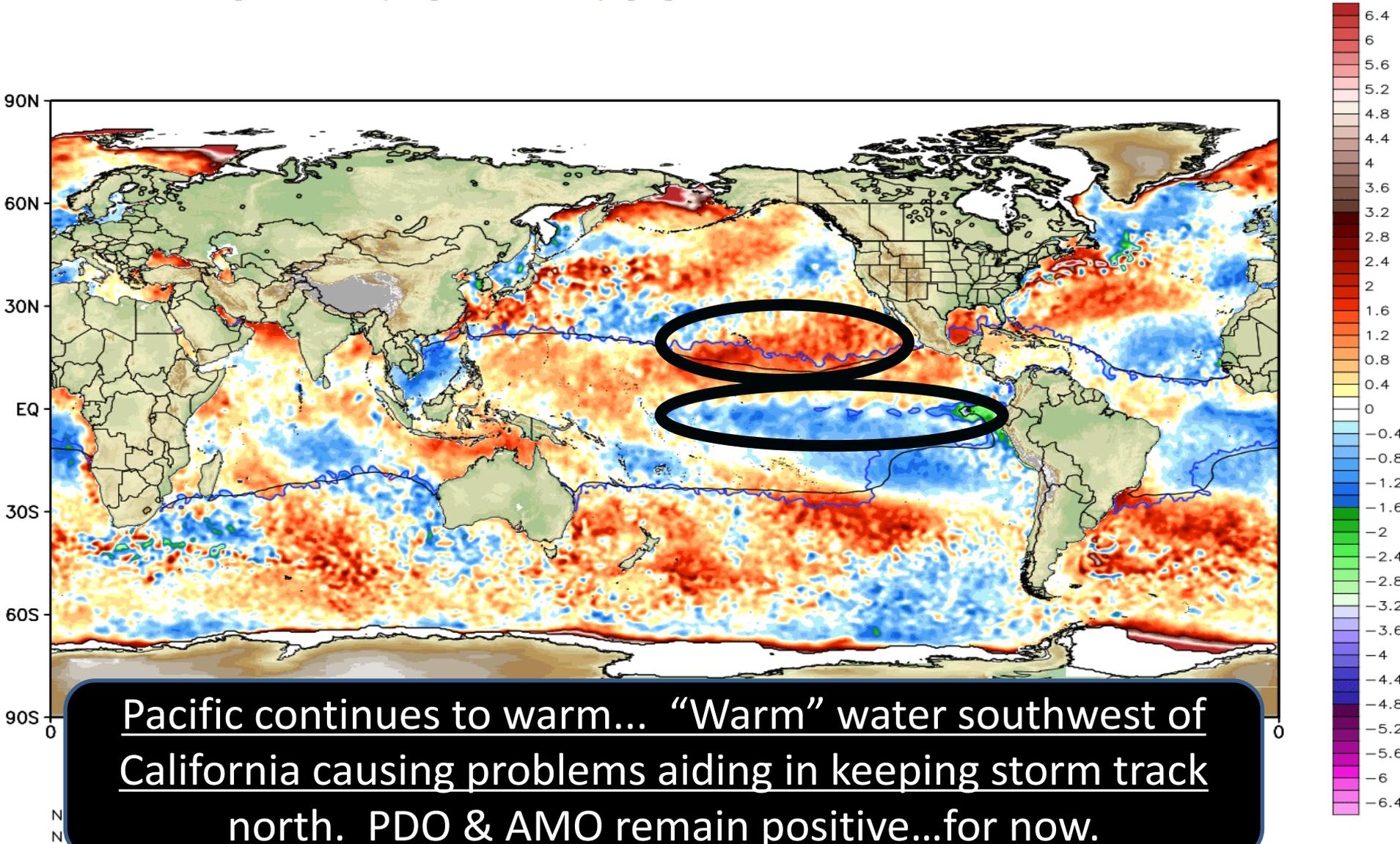
A Look at The Oceans



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Sea Surface Temperature Anomalies 4/16/18

NCEP CDASv2 [CFS Reanalysis] SST Anomaly [°C] 06Z16APR2018



Pacific Decadal Oscillation

Negative = Cold Positive = Warm

	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
2005	0.44	0.81	1.36	1.03	1.86	1.17	0.66	0.25	-0.46	-1.32	-1.50	0.20
2006	1.03	0.66	0.05	0.40	0.48	1.04	0.35	-0.65	-0.94	-0.05	-0.22	0.14
2007	0.01	0.04	-0.36	0.16	-0.10	0.09	0.78	0.50	-0.36	-1.45	-1.08	-0.58
2008	-1.00	-0.77	-0.71	-1.52	-1.37	-1.34	-1.67	-1.70	-1.55	-1.76	-1.25	-0.87
2009	-1.40	-1.55	-1.59	-1.65	-0.88	-0.31	-0.53	0.09	0.52	0.27	-0.40	0.08
2010	0.83	0.82	0.44	0.78	0.62	-0.22	-1.05	-1.27	-1.61	-1.06	-0.82	-1.21
2011	-0.92	-0.83	-0.69	-0.42	-0.37	-0.69	-1.86	-1.74	-1.79	-1.34	-2.33	-1.79
2012	-1.38	-0.85	-1.05	-0.27	-1.26	-0.87	-1.52	-1.93	-2.21	-0.79	-0.59	-0.48
2013	-0.13	-0.43	-0.63	-0.16	0.08	-0.78	-1.25	-1.04	-0.48	-0.87	-0.11	-0.41
2014	0.30	0.33	0.97	1.13	1.81	0.82	0.70	0.67	1.08	1.49	1.72	<u>2.51</u>
2015	<u>2.45</u>	<u>2.35</u>	2.00	1.44	1.22	1.54	1.84	1.56	1.94	1.47	0.86	1.01
2016	1.53	1.75	2.40	2.62	2.35	2.03	1.25	0.52	0.45	0.56	1.88	1.17
2017	0.77	0.70	0.74	1.12	0.88	0.79	0.10	0.09	0.32	0.05	0.15	0.50

Pacific Decadal Oscillation Phases

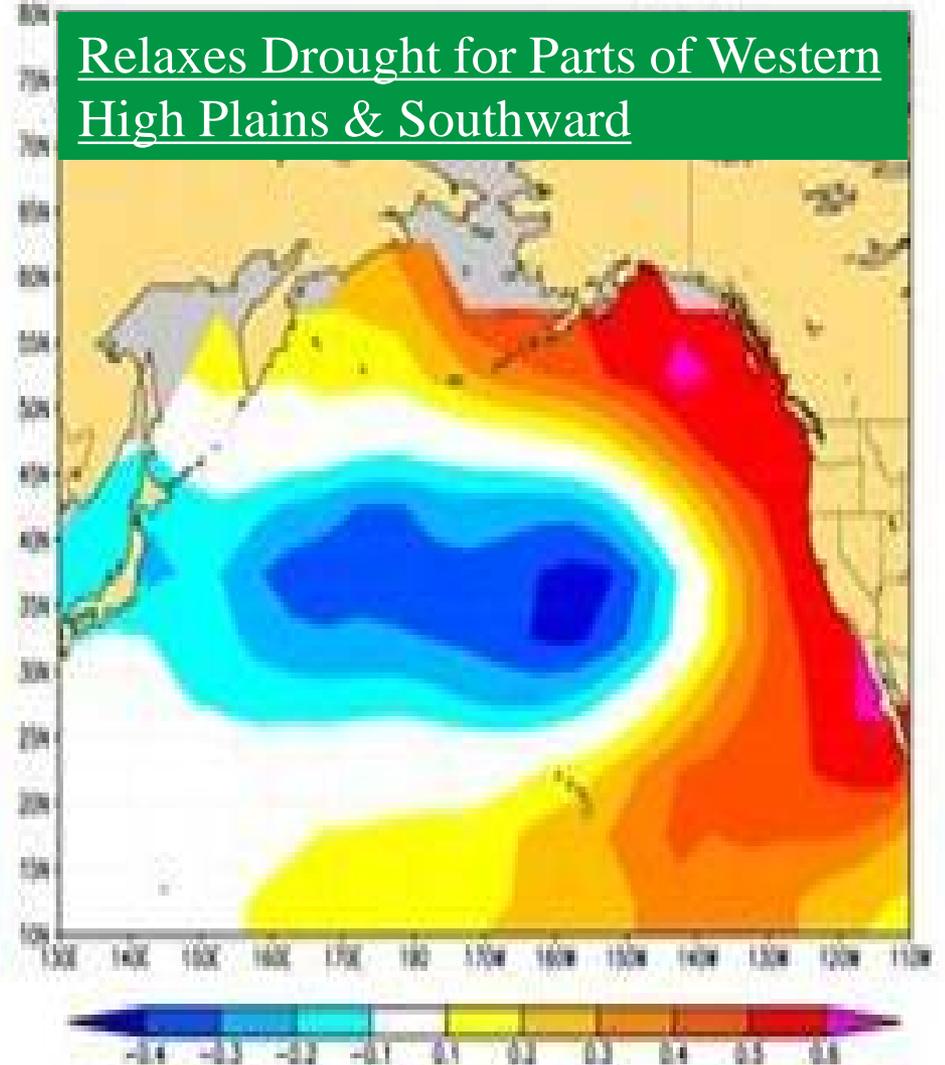
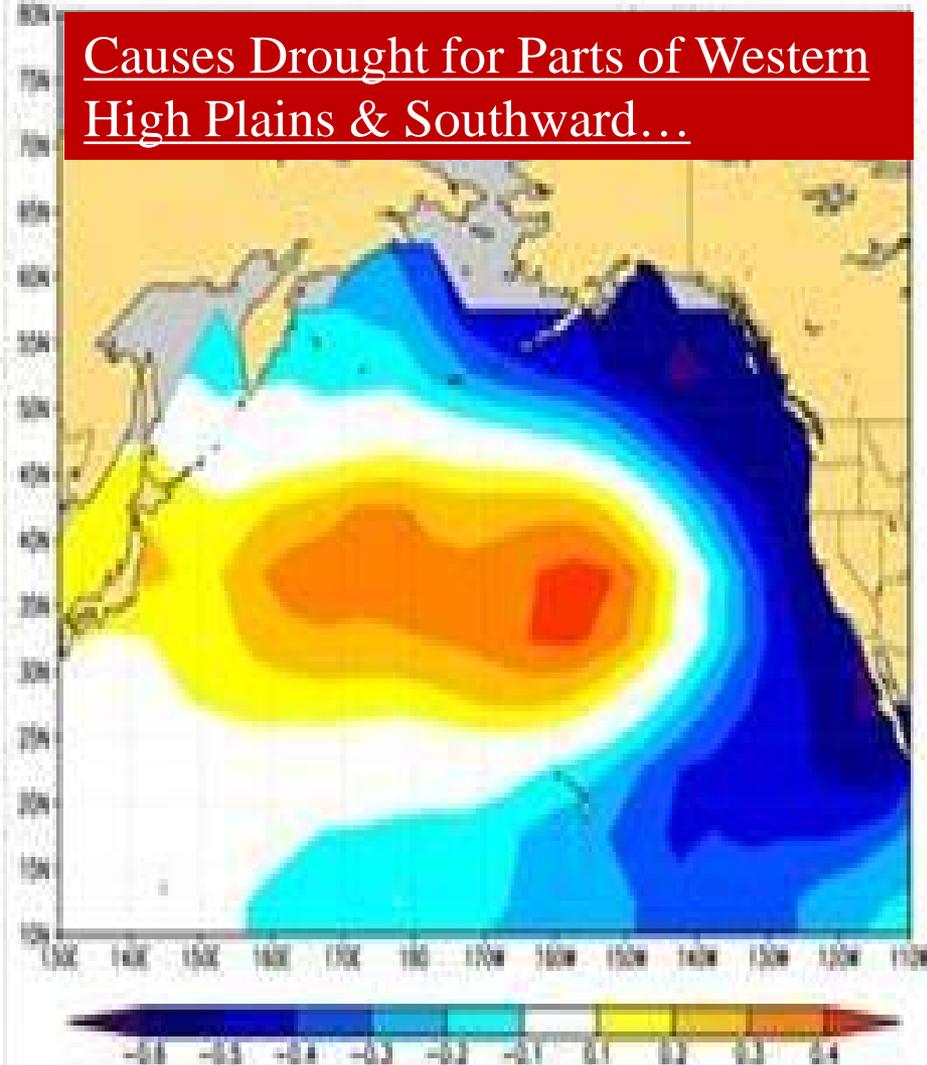
Pacific Decadal Oscillation
Cool Phase SST Anomaly (°C)



Pacific Decadal Oscillation
Warm Phase SST Anomaly (°C)

Causes Drought for Parts of Western High Plains & Southward...

Relaxes Drought for Parts of Western High Plains & Southward



Atlantic Multi-decadal Oscillation

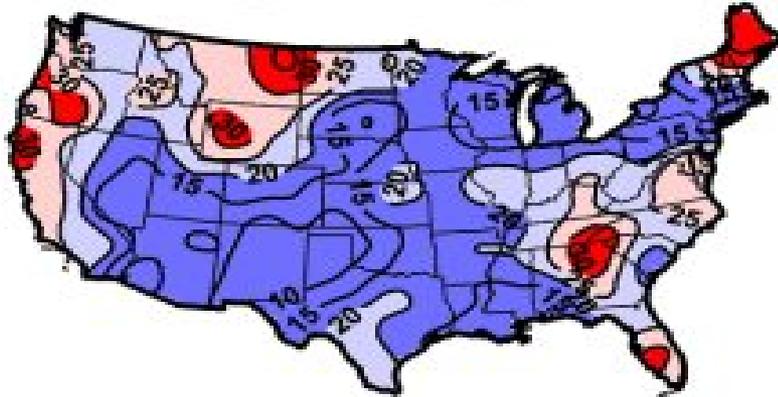
Negative = Cold Positive = Warm

	JAN	FEB	MAR	APR	MAY	JUN	JULY	AUG	SEP	OCT	NOV	DEC
2005	-0.04	0.06	1.37	0.51	0.88	1.65	0.71	1.05	0.77	0.99	0.34	1.00
2006	0.72	0.77	1.01	0.43	0.71	0.02	0.34	1.21	1.80	1.97	1.14	0.05
2007	0.32	0.95	-0.14	0.65	-0.14	0.82	1.56	0.81	1.07	1.21	1.11	0.65
2008	0.08	-0.09	-0.30	0.20	1.22	1.07	0.69	1.43	0.34	-0.16	-0.15	0.06
2009	0.15	0.13	-0.02	-0.58	-1.31	0.17	0.58	0.06	-0.81	0.96	0.19	0.59
2010	0.53	1.69	0.65	1.08	1.34	1.30	1.17	1.70	2.61	1.97	1.81	2.33
2011	1.76	1.02	0.23	-0.25	-0.81	-0.59	-0.39	0.54	0.20	0.20	0.28	-1.04
2012	-0.81	-0.59	-0.65	-0.26	-0.07	1.50	1.96	1.67	0.99	1.69	0.58	0.67
2013	0.44	0.21	1.30	0.10	-1.09	-1.10	-0.26	0.28	0.44	1.55	0.30	-0.19
2014	-0.30	-0.55	-1.12	-0.94	-1.08	0.08	-0.26	1.15	0.67	0.56	-0.10	-1.20
2015	-1.56	-1.47	-1.88	-1.81	-2.24	-2.37	-0.76	-0.87	-0.26	-0.22	-0.57	-1.39
2016	-0.86	-1.72	-1.74	-1.64	-1.43	-0.32	-0.07	0.50	-0.16	0.25	0.17	-0.18
2017	-0.58	0.08	-0.61	-0.81	0.22	0.06	-0.089	0.00	0.31	0.16	0.39	0.33

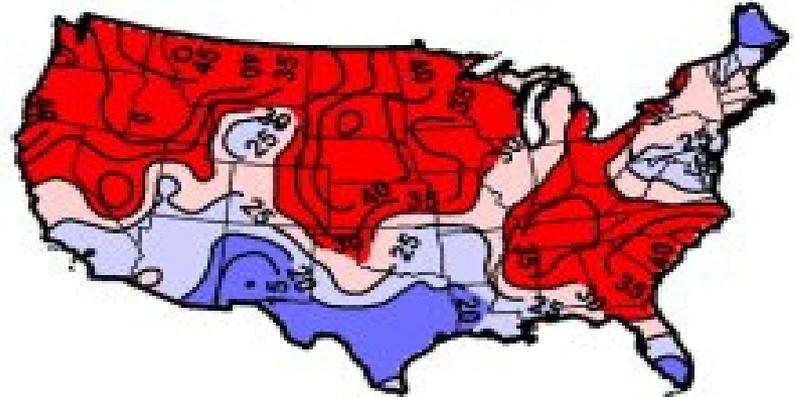
Pertaining to Drought Frequency (McCabe 2004)

Blue = Lower Frequency Red = Higher Frequency

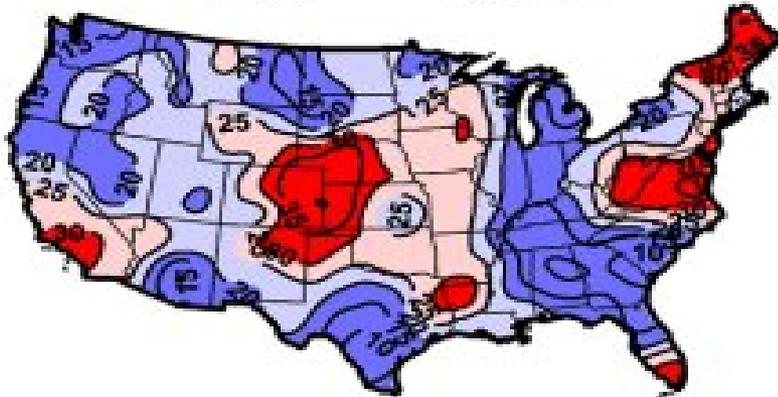
+PDO -AMO



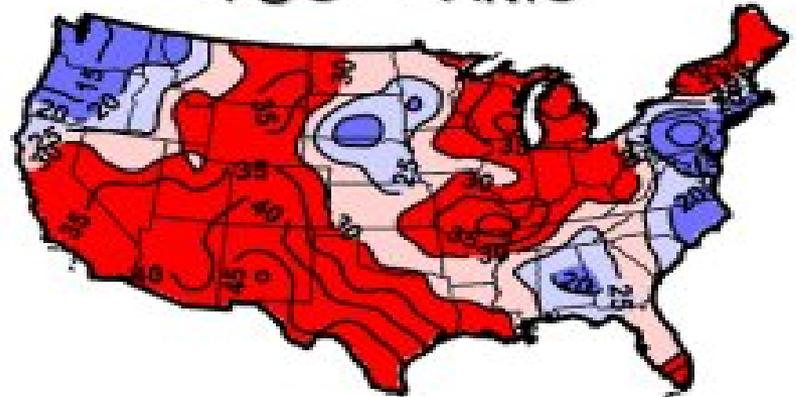
+PDO +AMO



-PDO -AMO



-PDO +AMO



25% = normal drought frequency

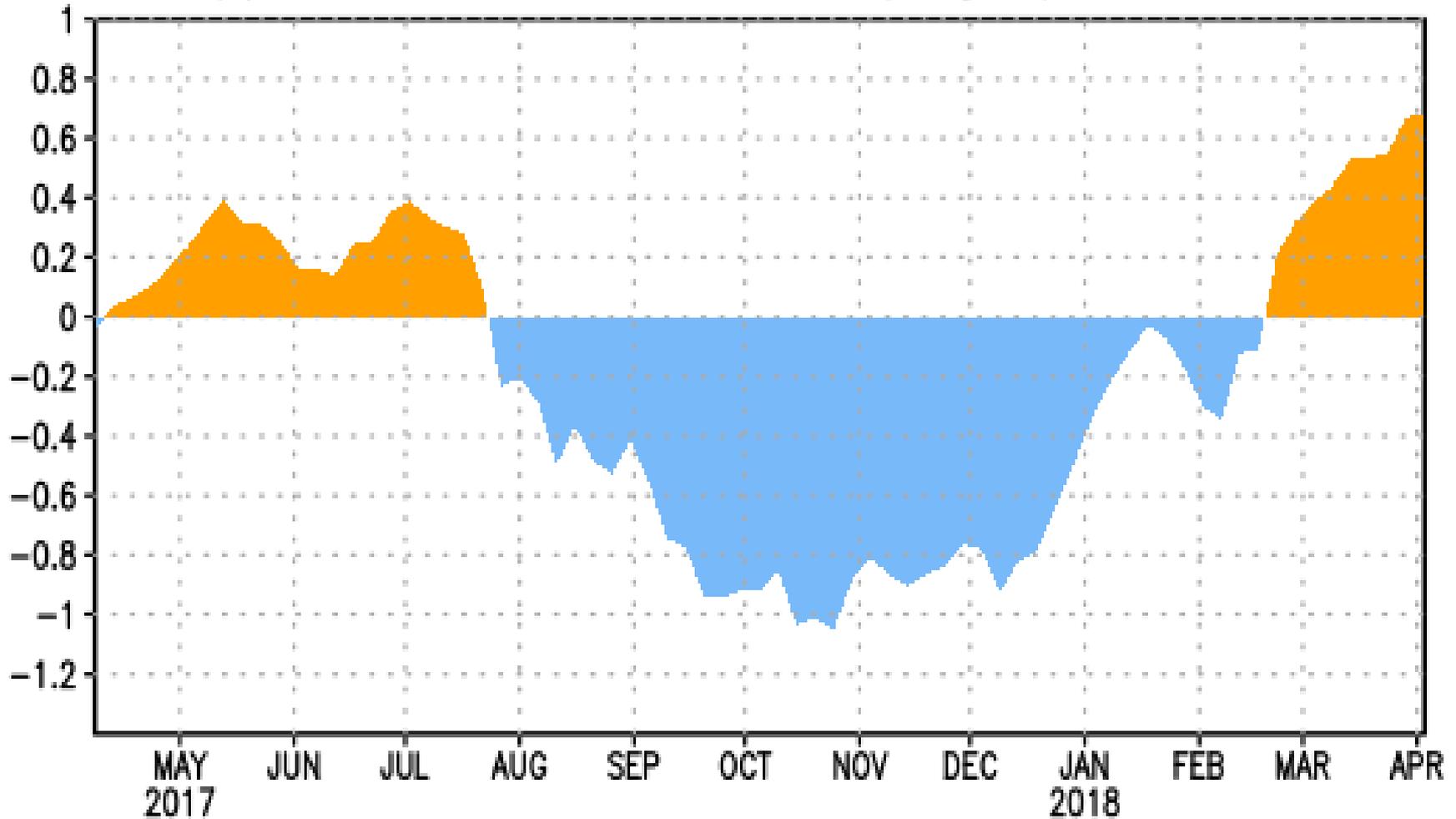
ENSO Forecast Update!



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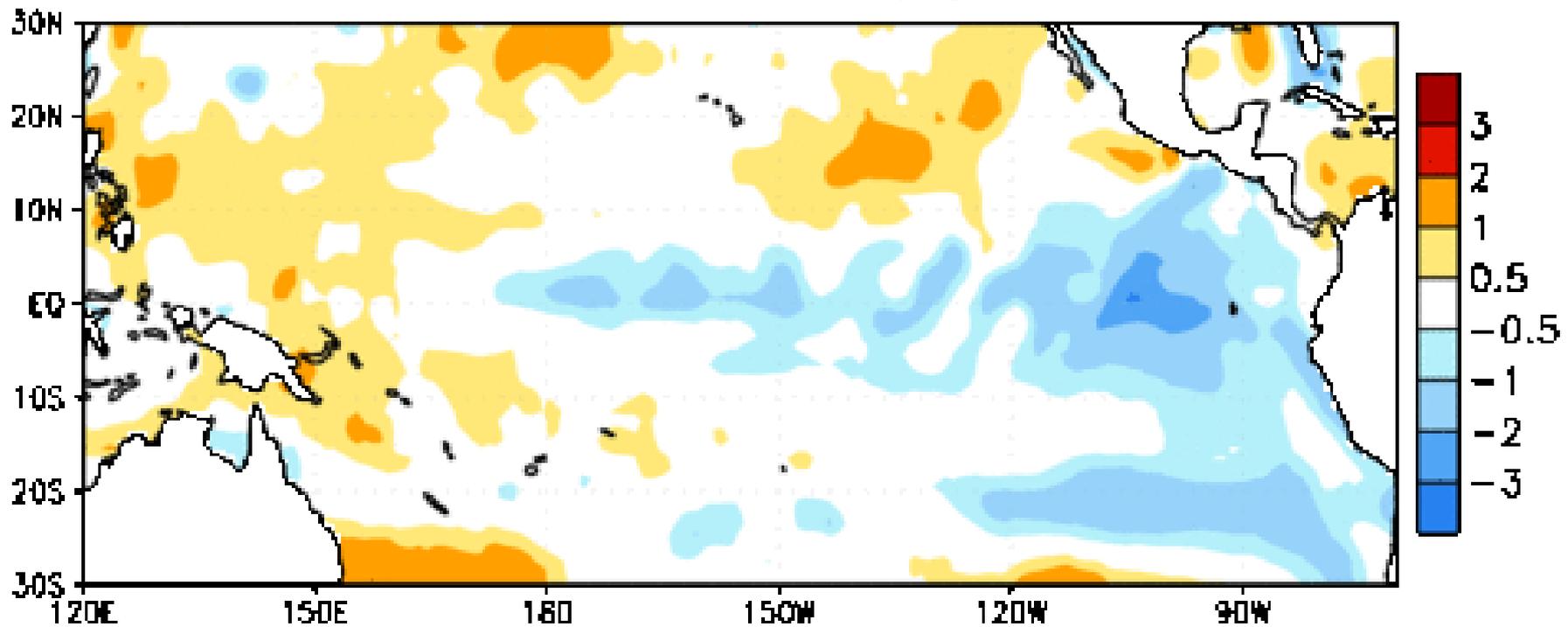
La Niña Prevailed Fall 2017 – Winter 2018

EQ. Upper-Ocean Heat Anoms. (deg C) for 180–100W



La Niña Continues to Dissipate as Pacific Warms

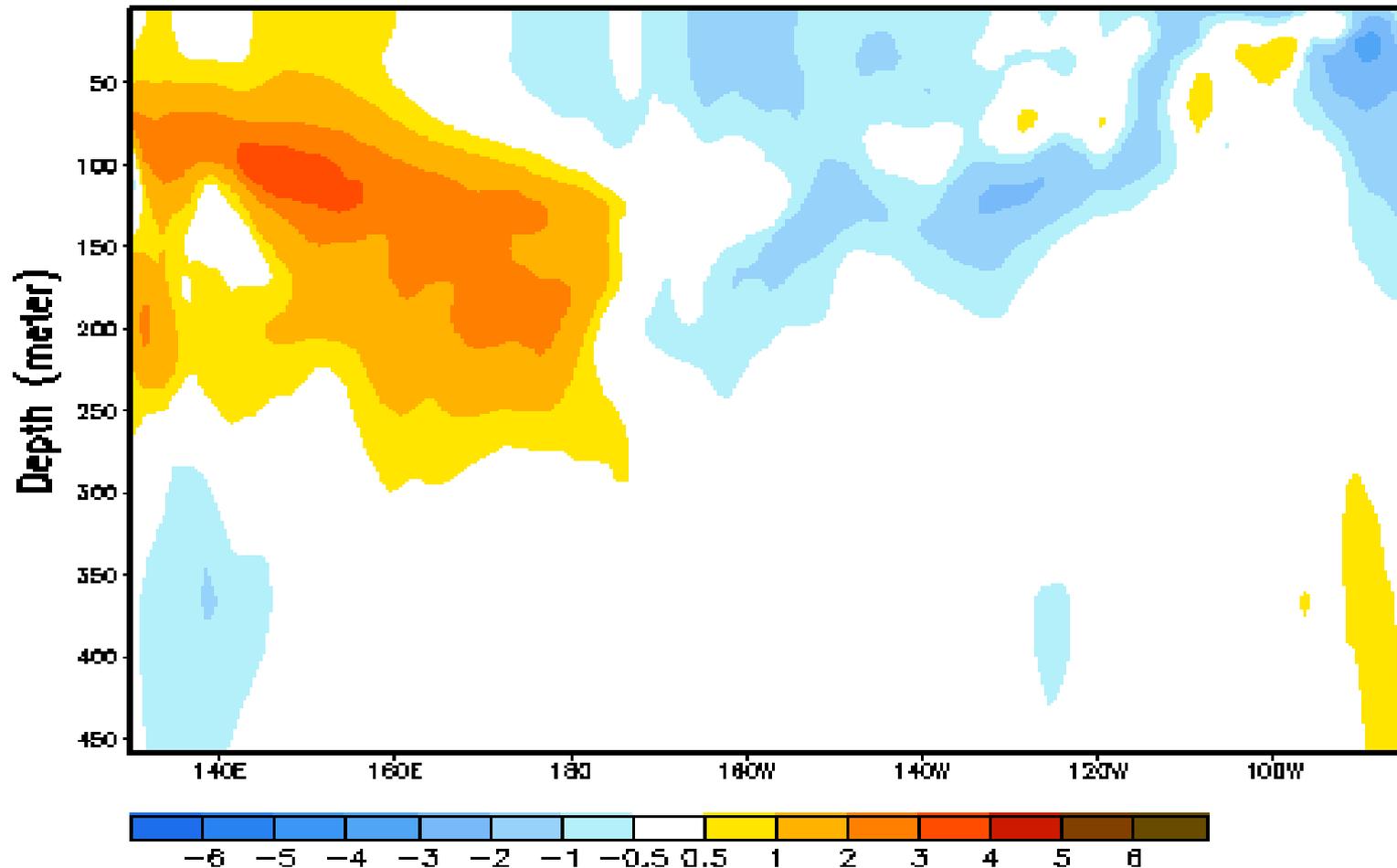
Week centered on 24 JAN 2018
SST Anomalies (°C)



Something to watch...

Warmer than average water beneath the surface...

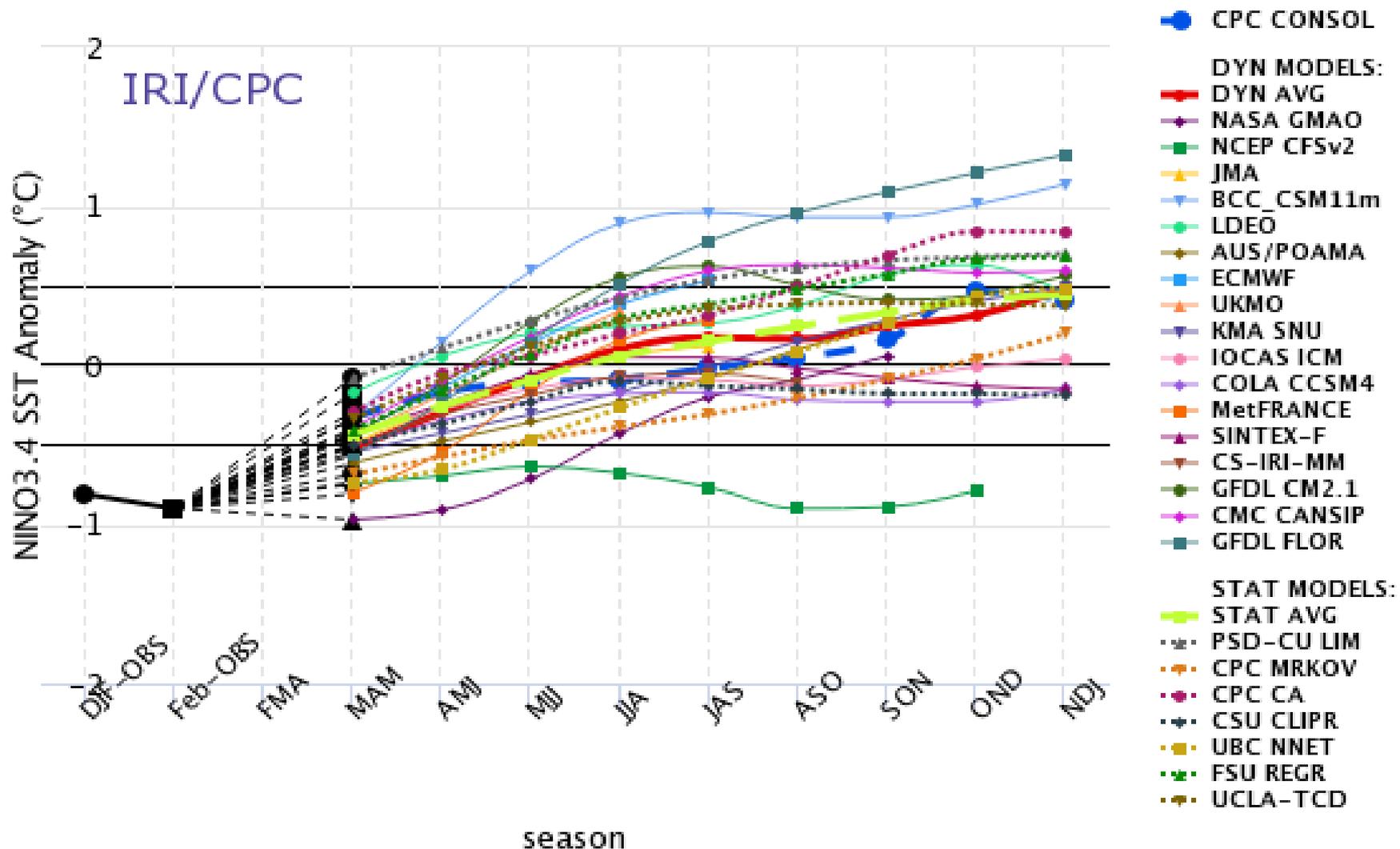
Equatorial Temperature Anomaly (°C)
Pentad centered on 07 FEB 2018



ENSO Plumes Ensemble

Favors Neutral to Weak El Niño Development

Mid-Mar 2018 Plume of Model ENSO Predictions



Long Range Forecast: NMME Computer Model Forecast



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NMME Model Precipitation Forecast

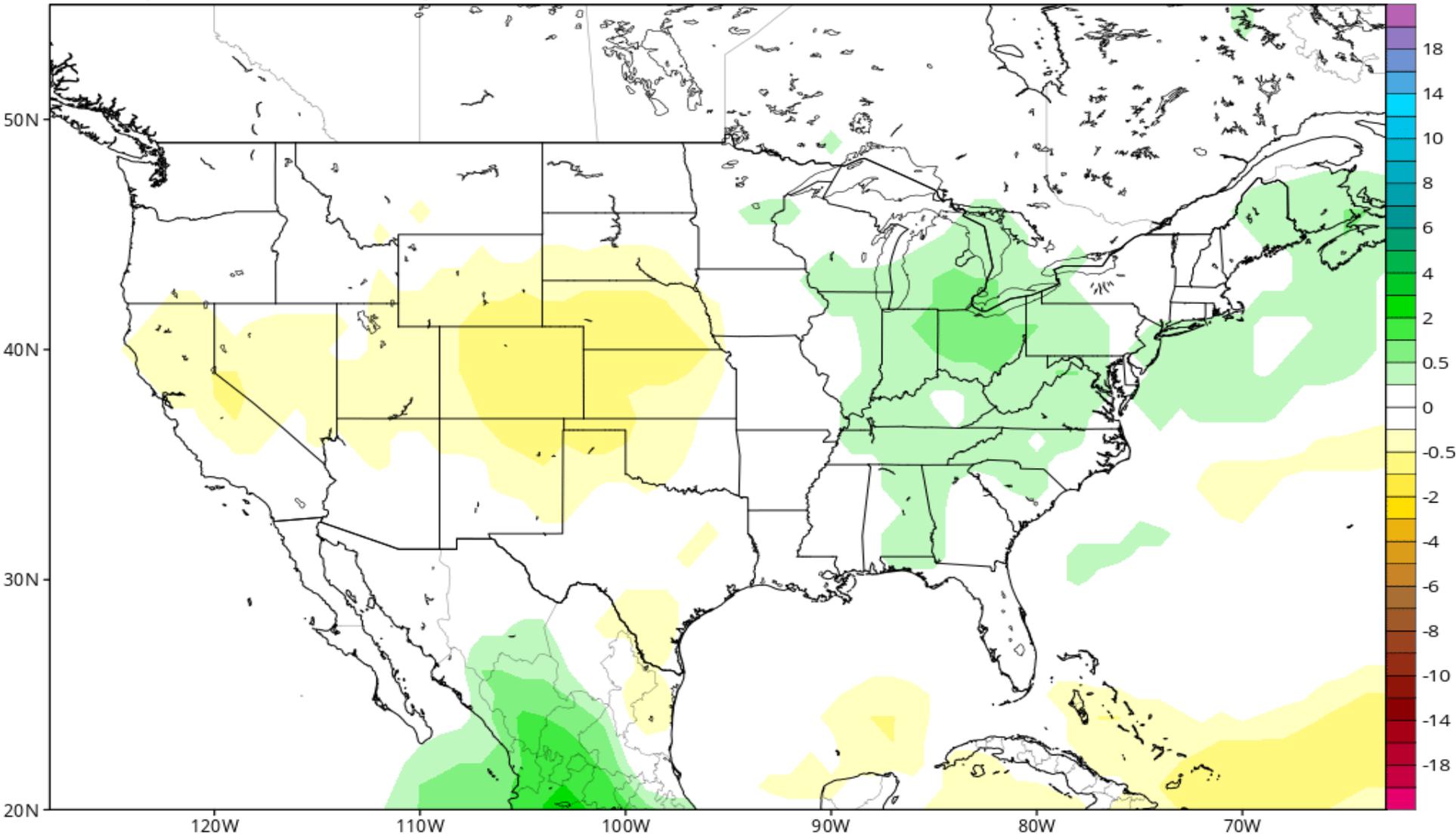
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: May 2018

TROPICALTIDBITS.COM



NMME Model Precipitation Forecast

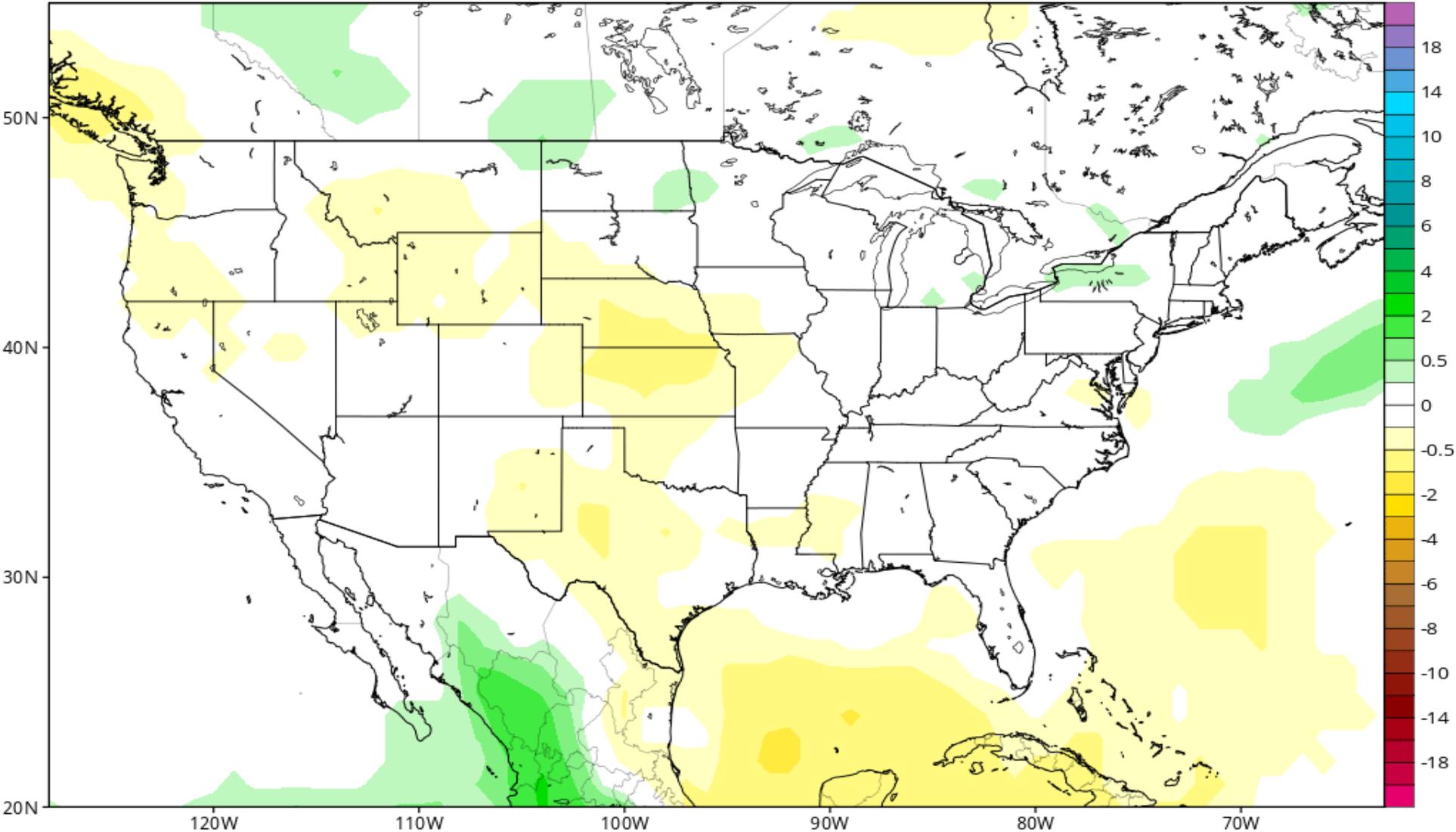
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Jun 2018

TROPICALTIDBITS.COM



NMME Model Precipitation Forecast

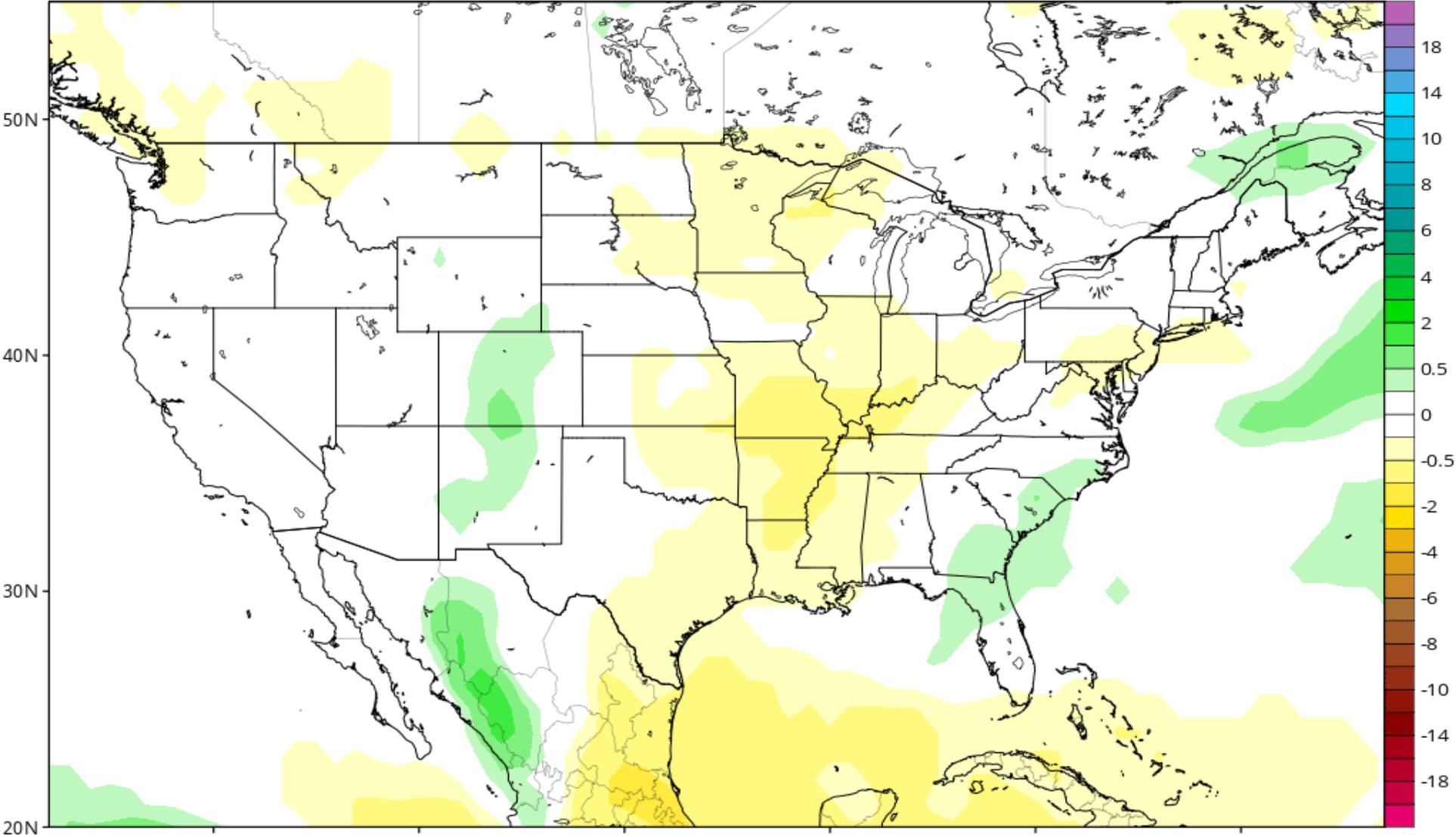
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Jul 2018

TROPICALTIDBITS.COM



NMME Model Precipitation Forecast

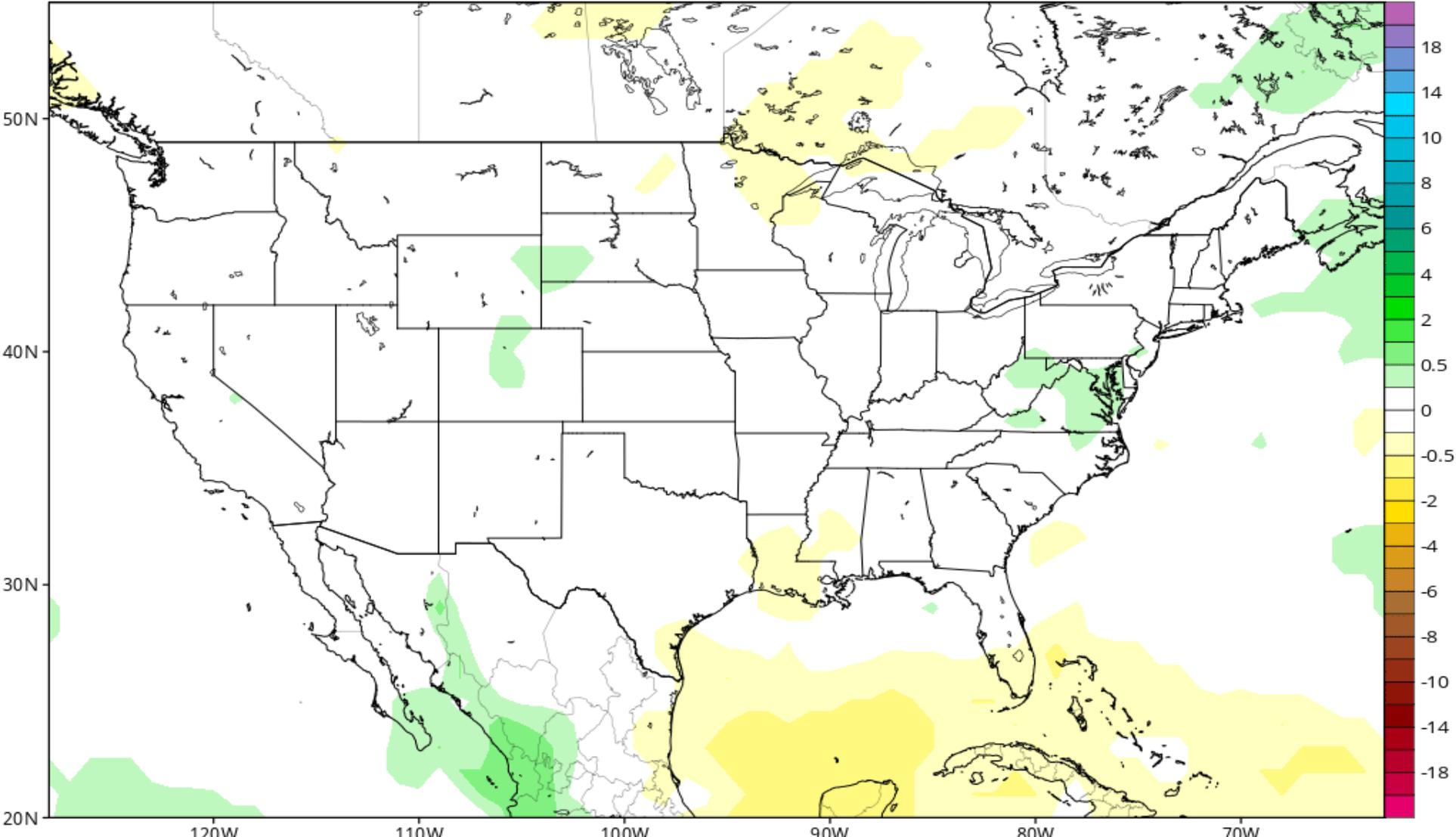
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Aug 2018

TROPICALTIDBITS.COM



NMME Model Precipitation Forecast

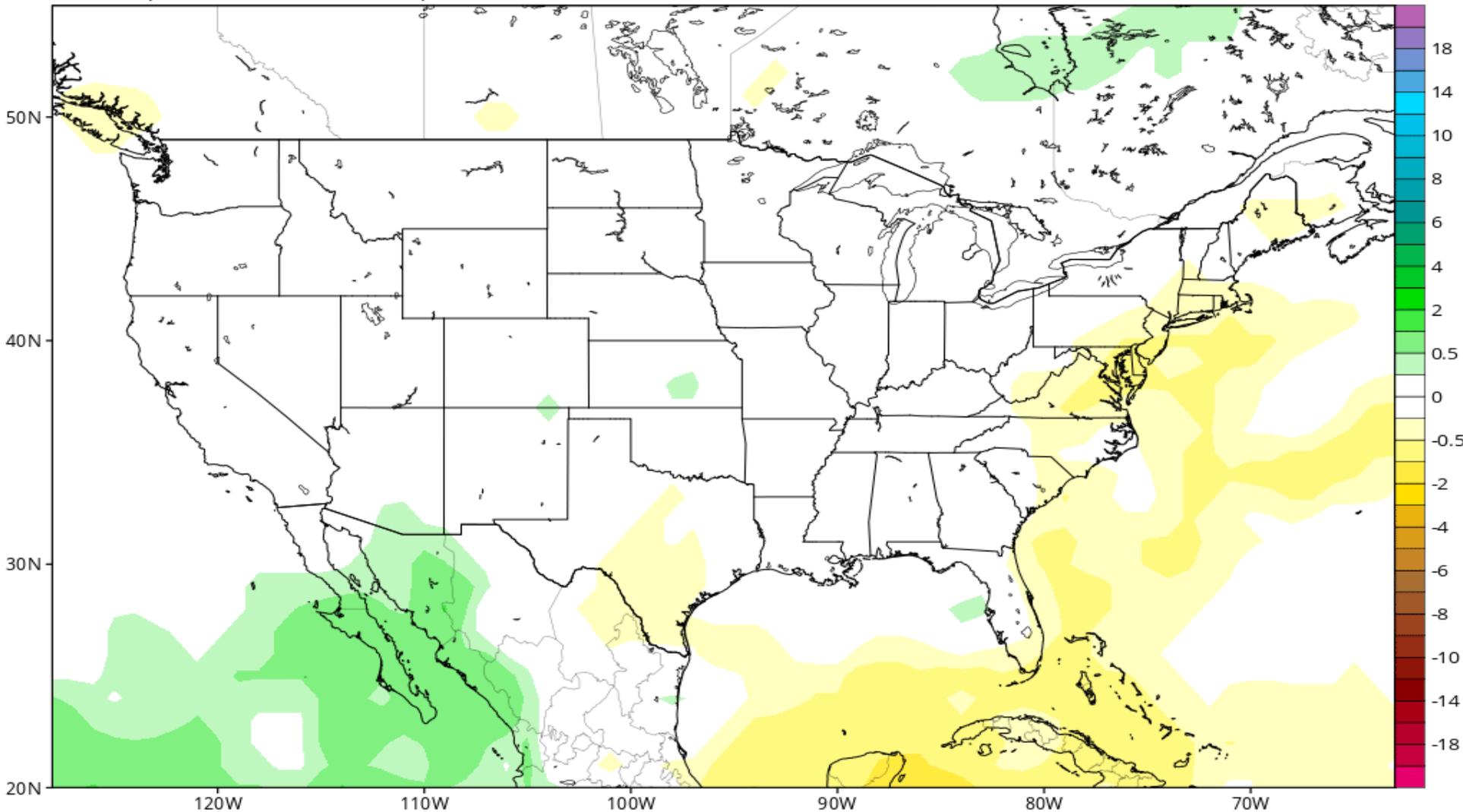
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Sep 2018

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NMME Model Precipitation Forecast

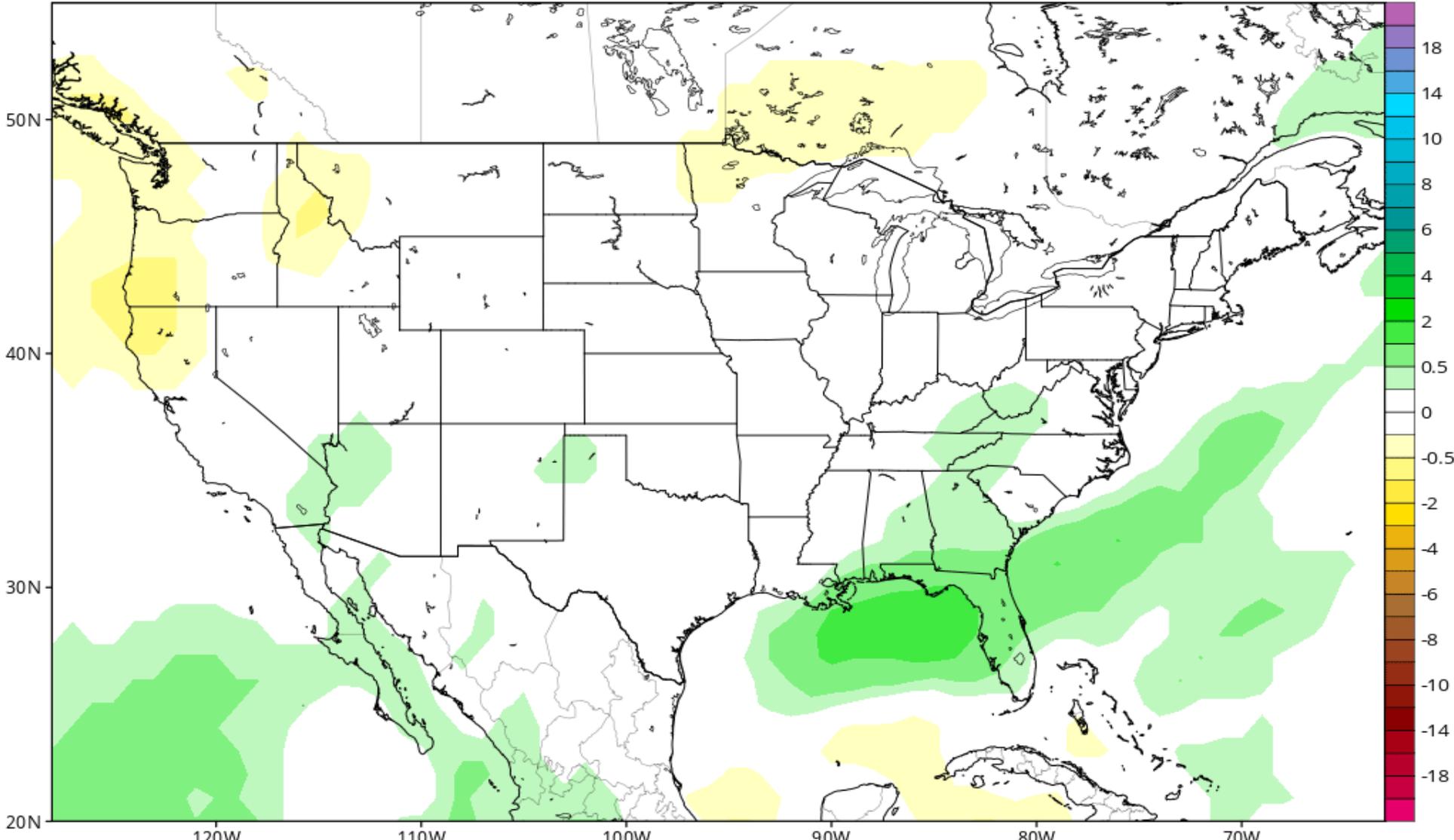
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Oct 2018

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NMME Model Precipitation Forecast

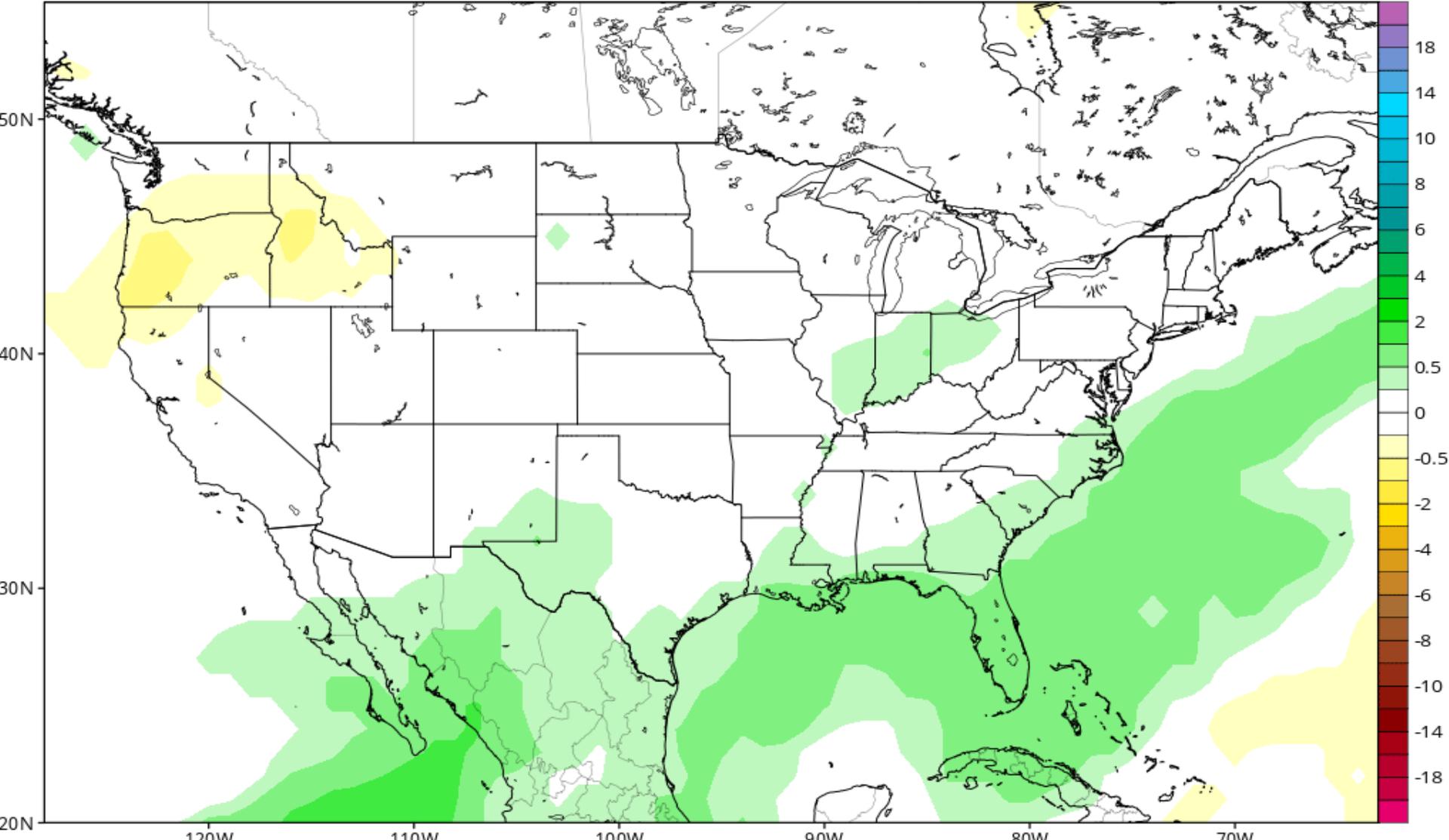
Green = Wetter Brown = Drier White = "Average"

NMME Total Accumulated Precipitation Anomaly (inches)

Init: 00z Apr 08 2018

Valid for: Nov 2018

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Long Range Forecast: JAMSTEC Computer Model Forecast

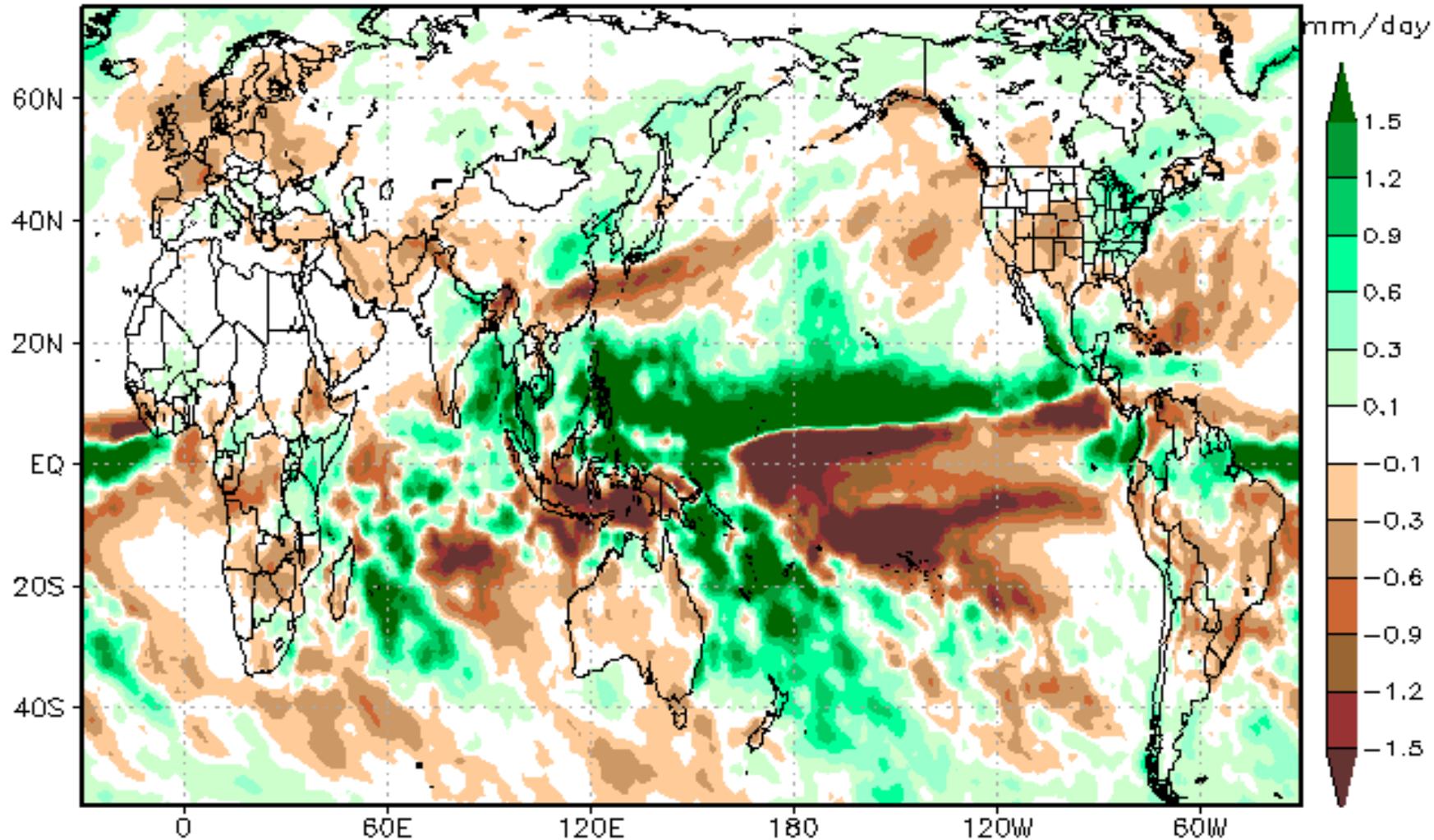


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JAMSTEC Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

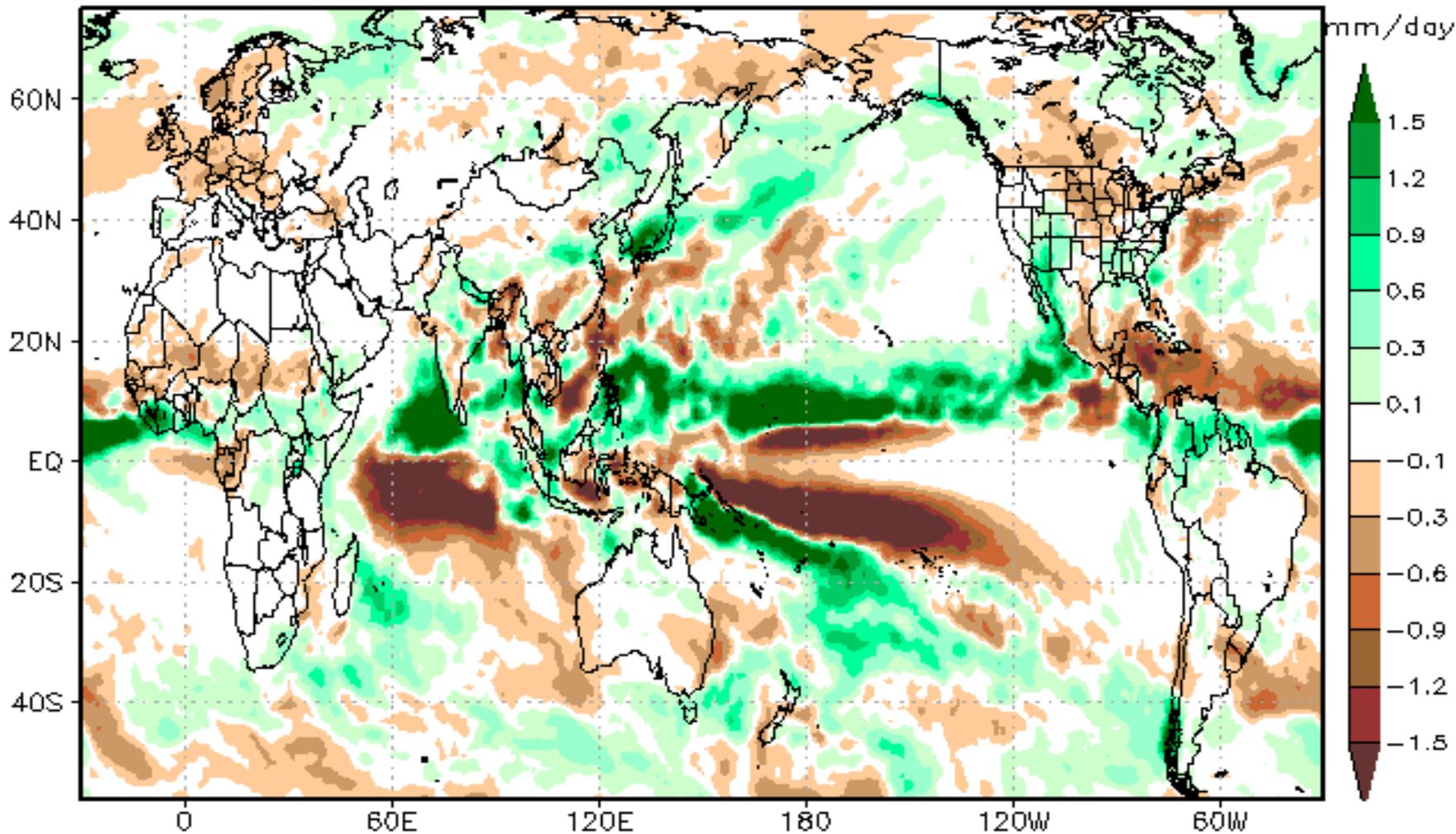
Predicted MAM2018 tprep anom. from 1mar2018 (9-member)



JAMSTEC Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

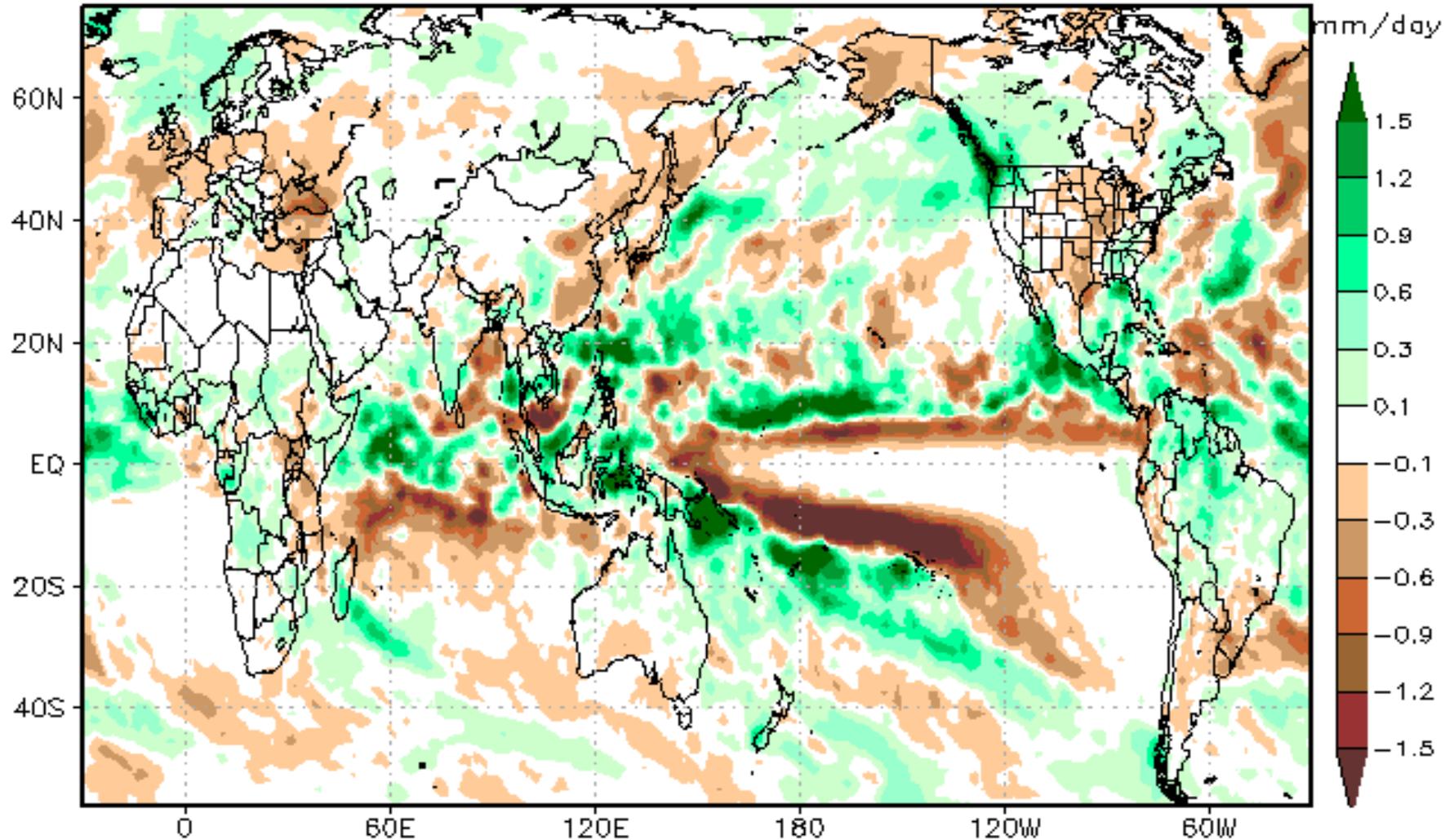
Predicted JJA2018 tprep anom. from 1mar2018 (9-member)



JAMSTEC Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

Predicted SON2018 tprep anom. from 1mar2018 (9-member)



Long Range Forecast: CFSv2 Computer Model Forecast

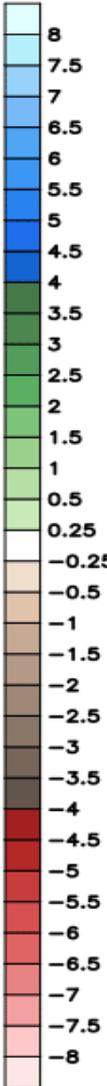
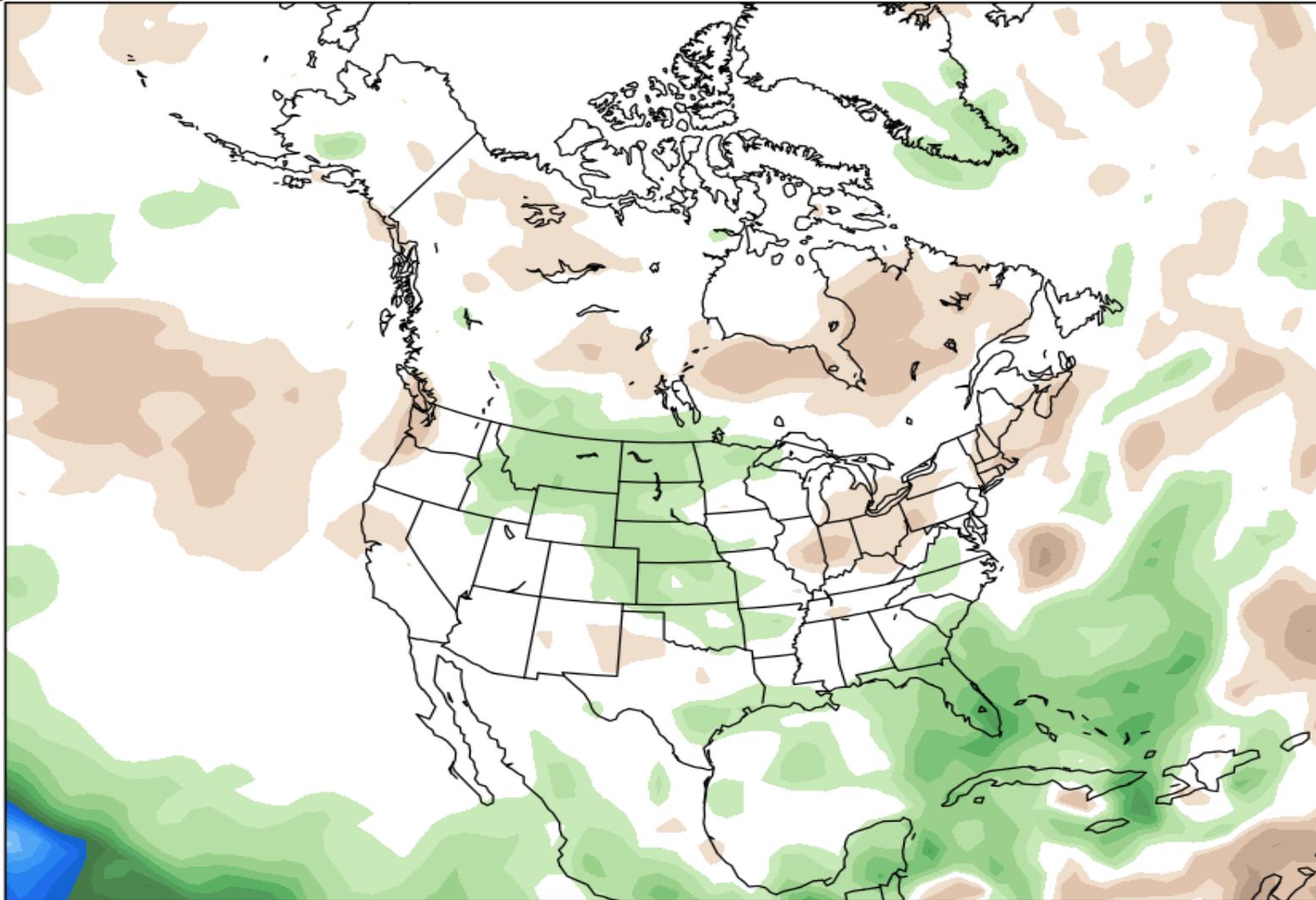


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CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: MAY 2018

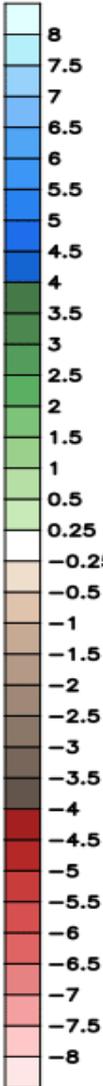
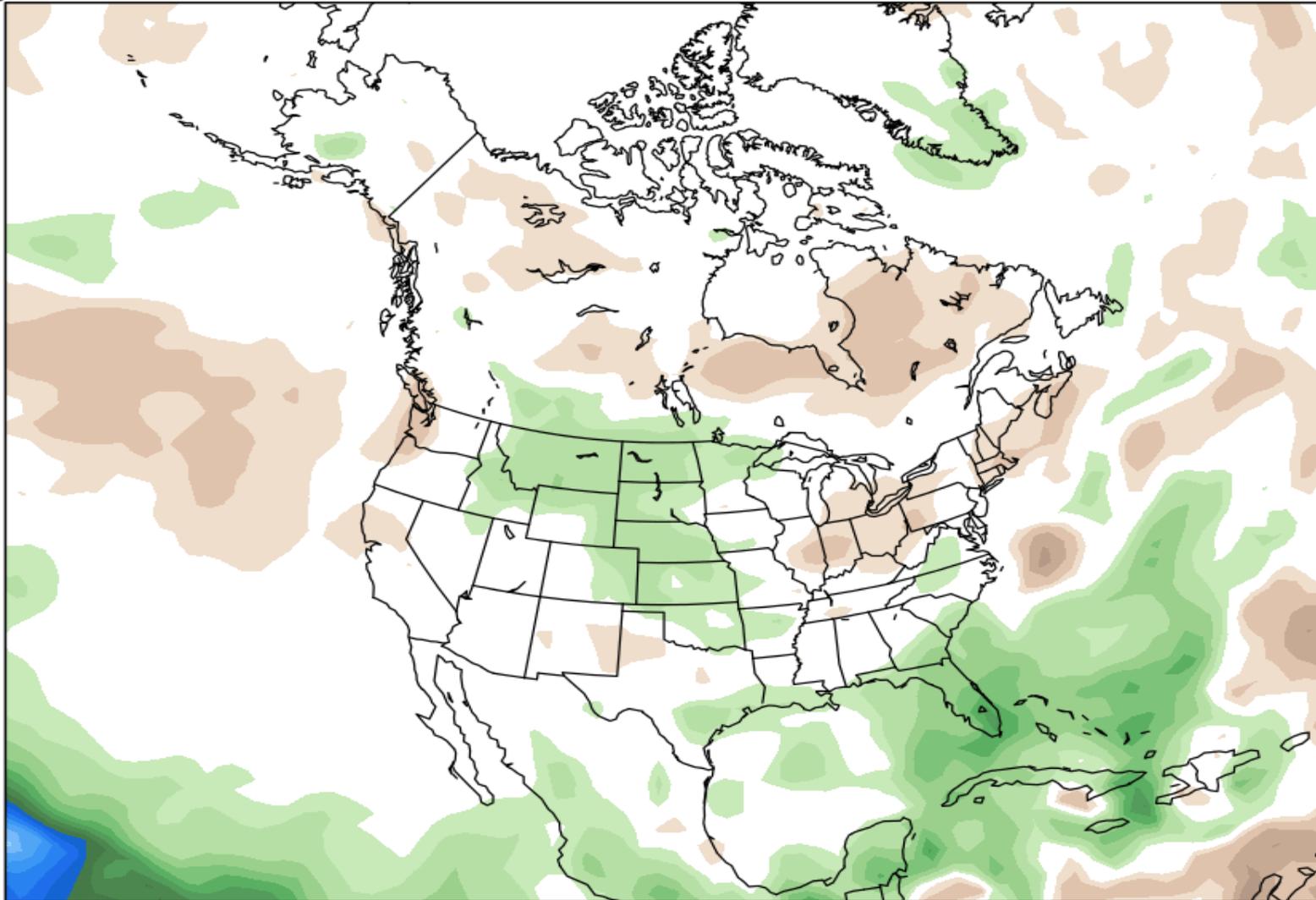


Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: MAY 2018

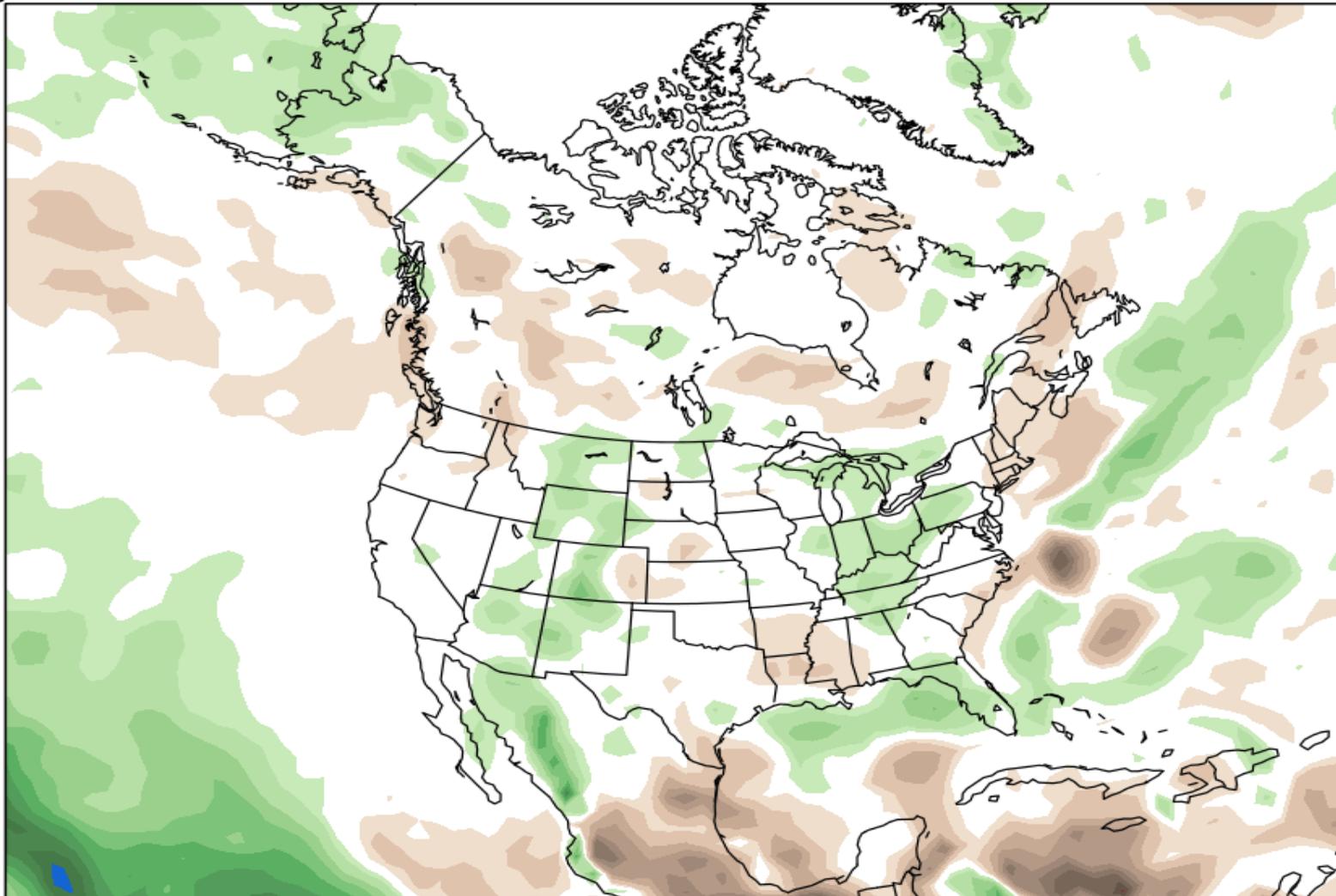


Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: JULY 2018

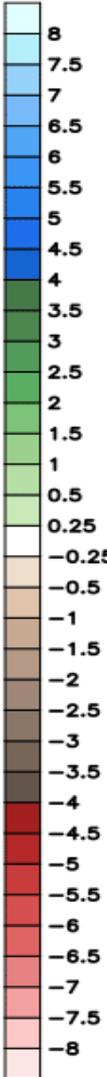
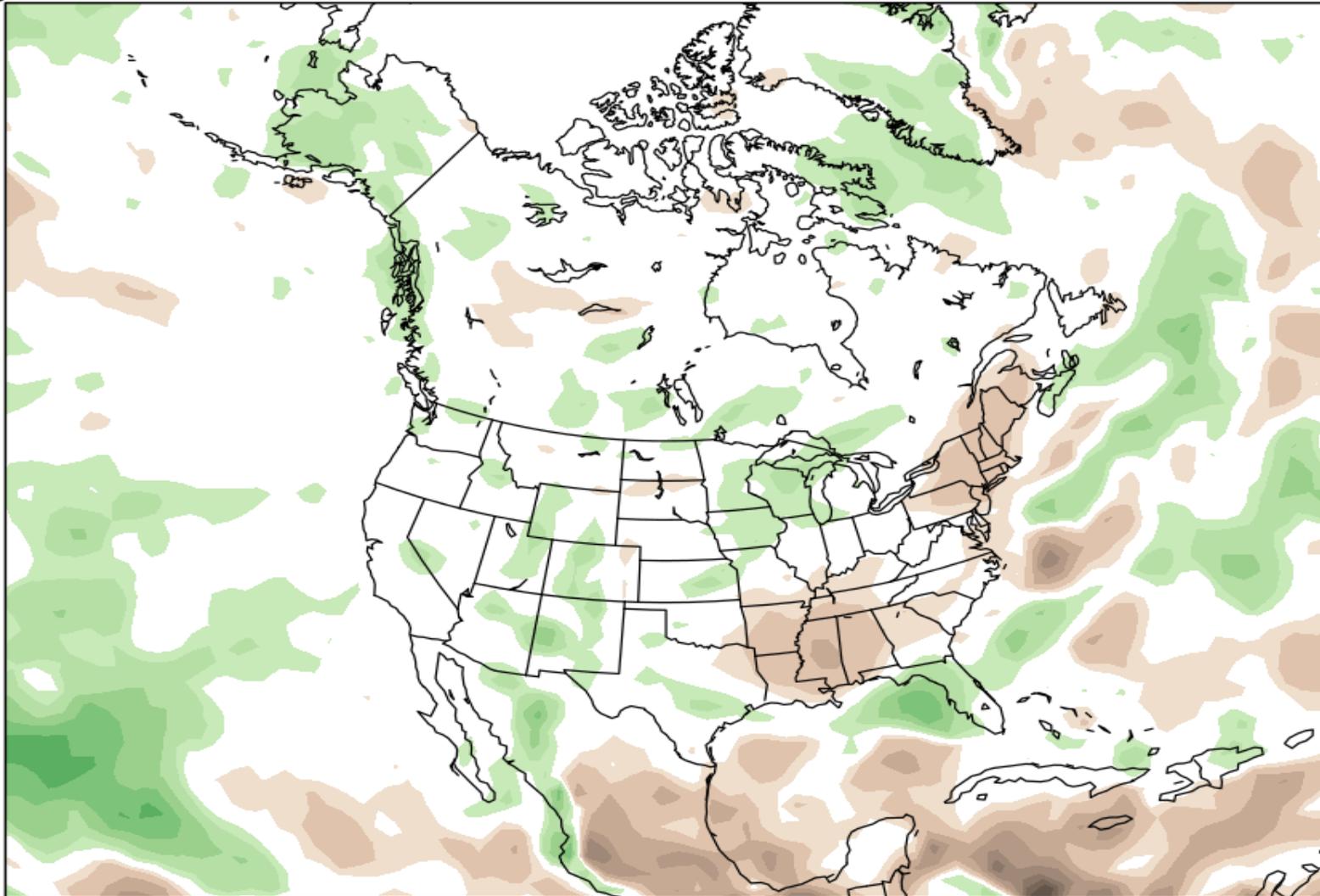


Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: AUGUST 2018

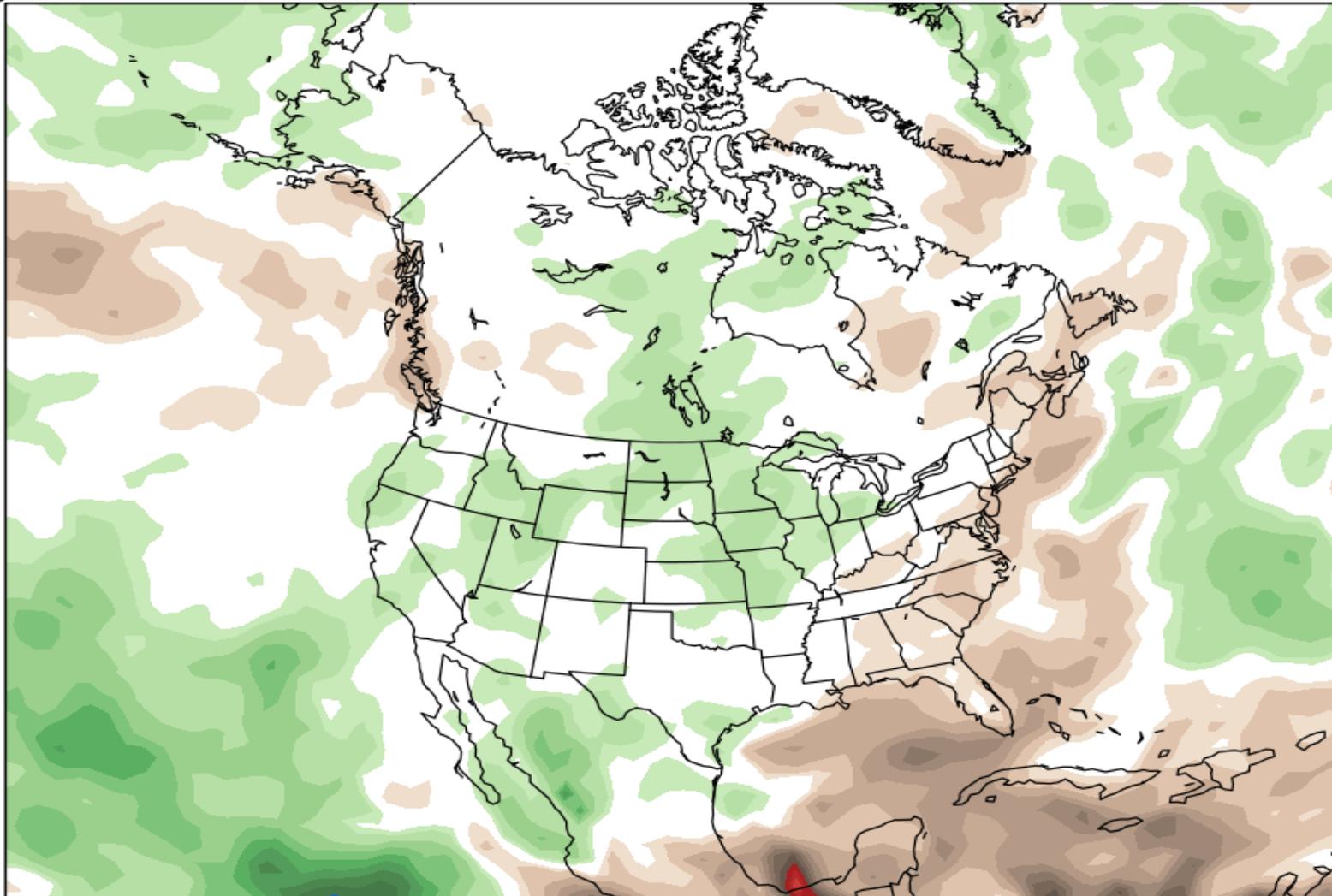


Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: SEPTEMBER 2018



Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

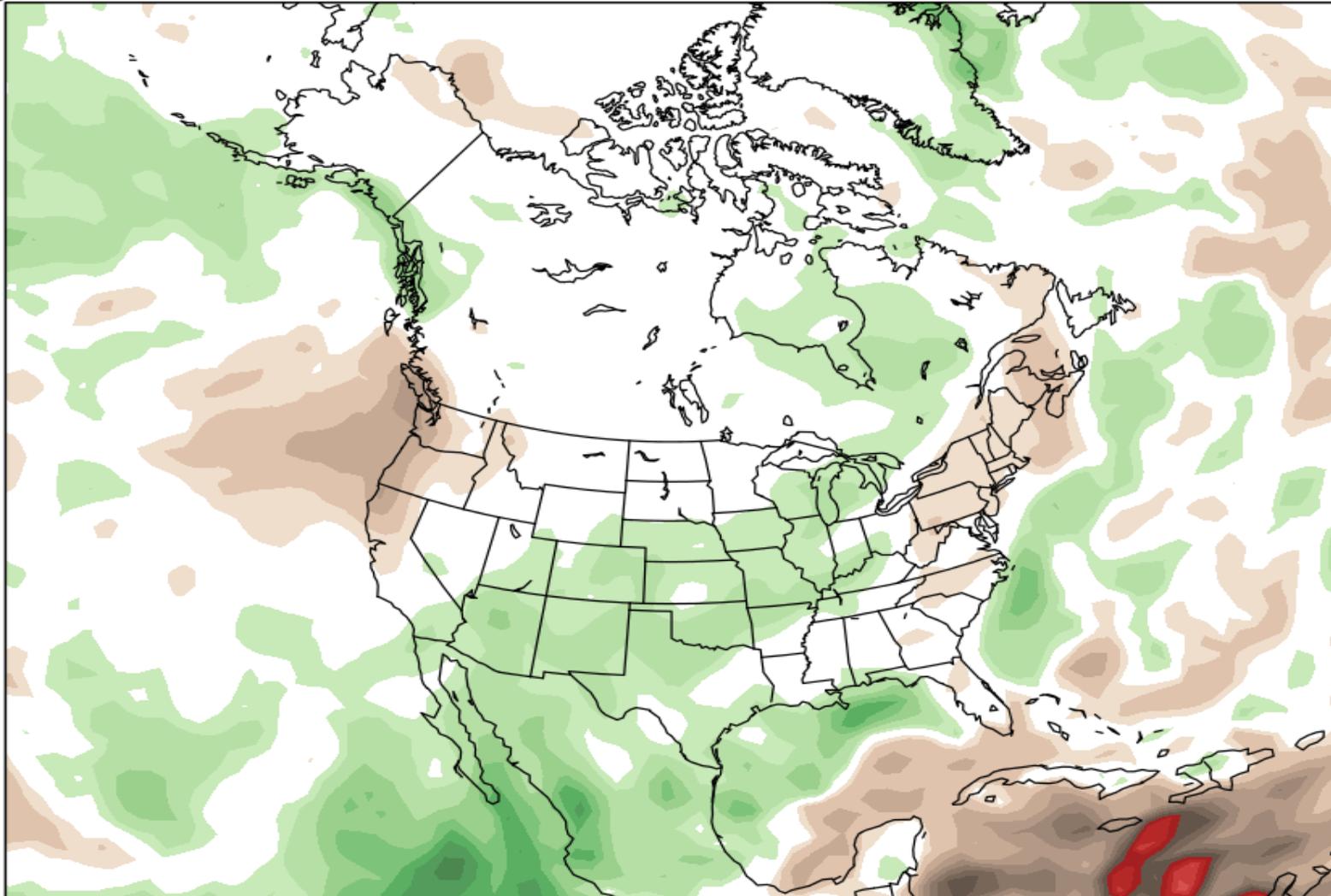
CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure

4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk

Target Month: OCTOBER 2018

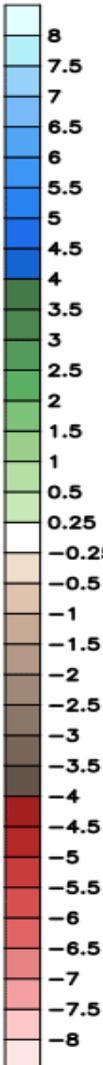
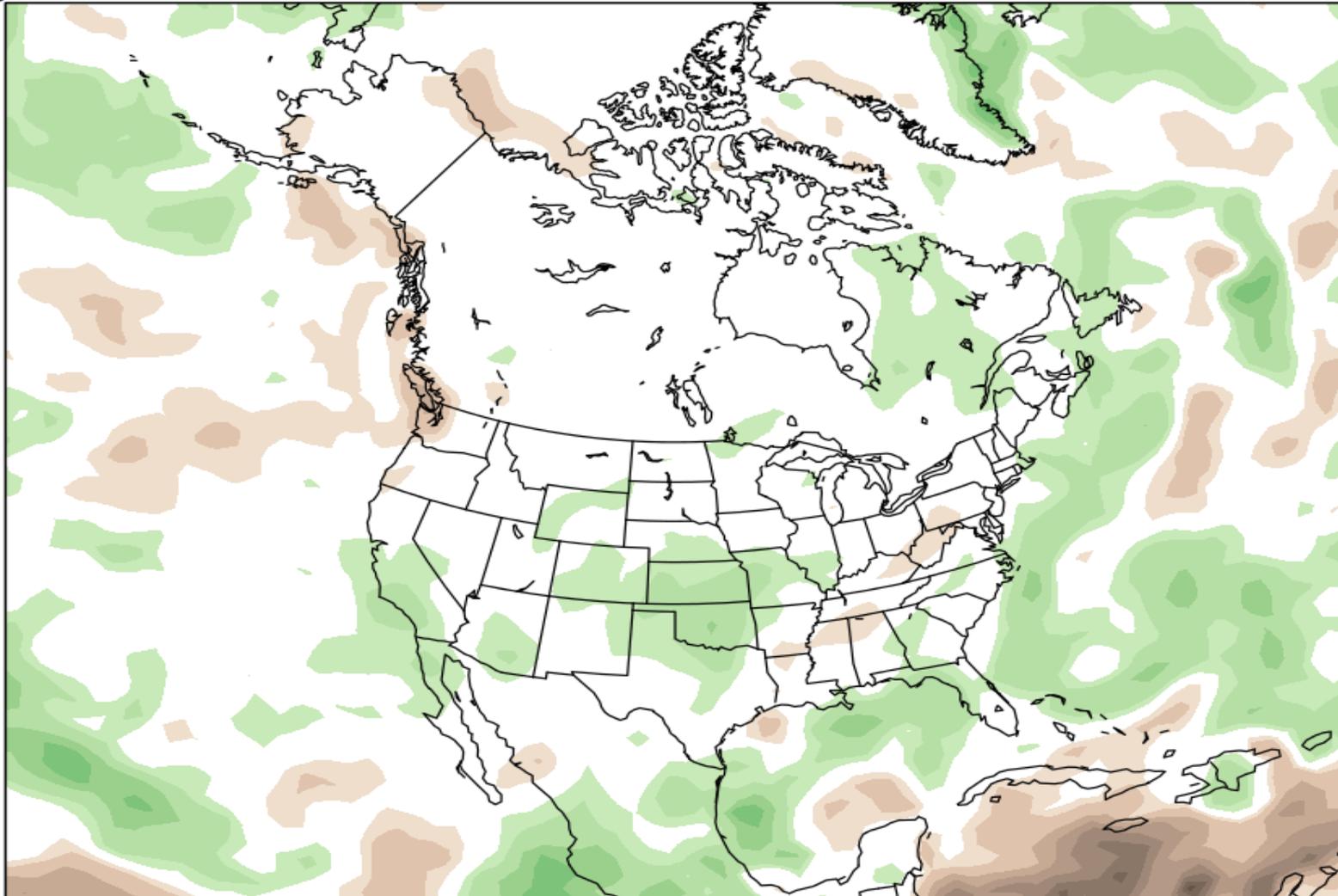


Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

CFSv2 Model Precipitation Forecast

Green = Wetter Brown = Drier White = "Average"

NCEP CFSv2 Precipitation [inches] Monthly Mean Forecast Departure
4 Daily Ensemble Runs Averaged from: 00Z06APR2018 --> 00Z16APR2018 10-day Chunk
Target Month: NOVEMBER 2018



Precipitation (shaded) -- Monthly Average
NCEP CFSv2 384x190 Surface Flux Thinned Gaussian Forecast Grid

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- *My Thoughts...*
- La Niña continues to die as Pacific warms. No immediate transition to El Niño, but gradual transition could occur later this year.
- That would dry out the Pacific Northwest, Northern Rockies, and Northern Plains.
- Until that happens, moisture should continue to be at least average if not above average.
- Drought relief in The Southwest, Southern Rockies, and Southern Plains will take time.

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- brianbledsoewx@gmail.com
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