The 2014 Primera drought over Central America

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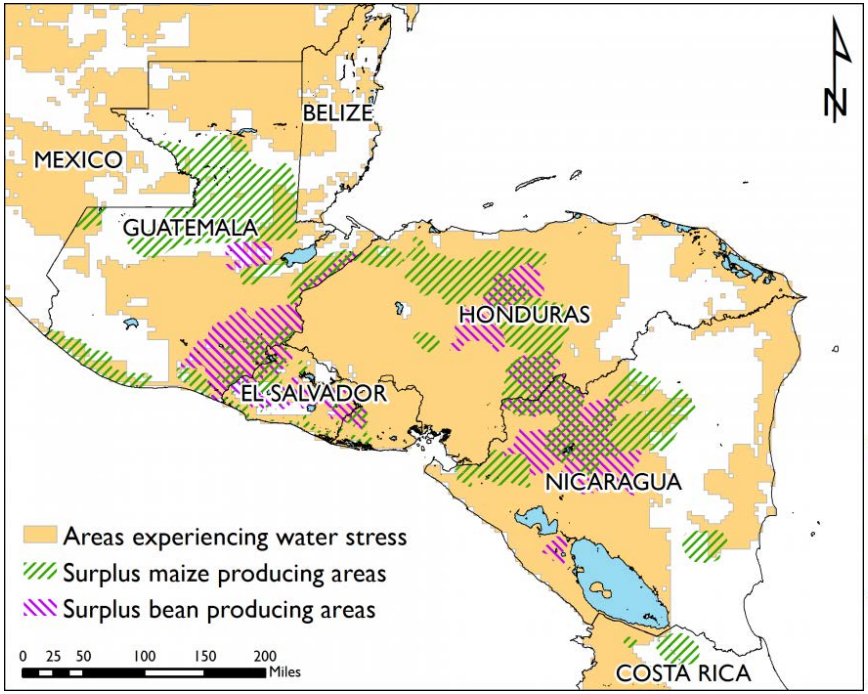
Outline

- **Annual cycle of precipitation**
- **Characteristics of the 2014 Primera drought**
- **Attribution**
- **2015 Primera drought**
- **Summary**

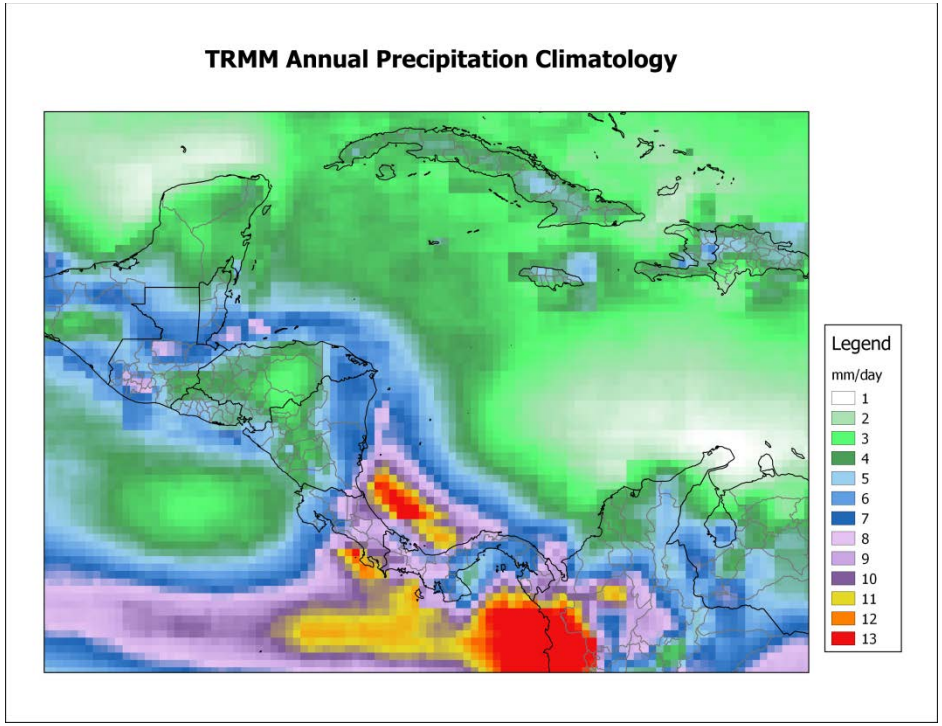
Impacts on agriculture

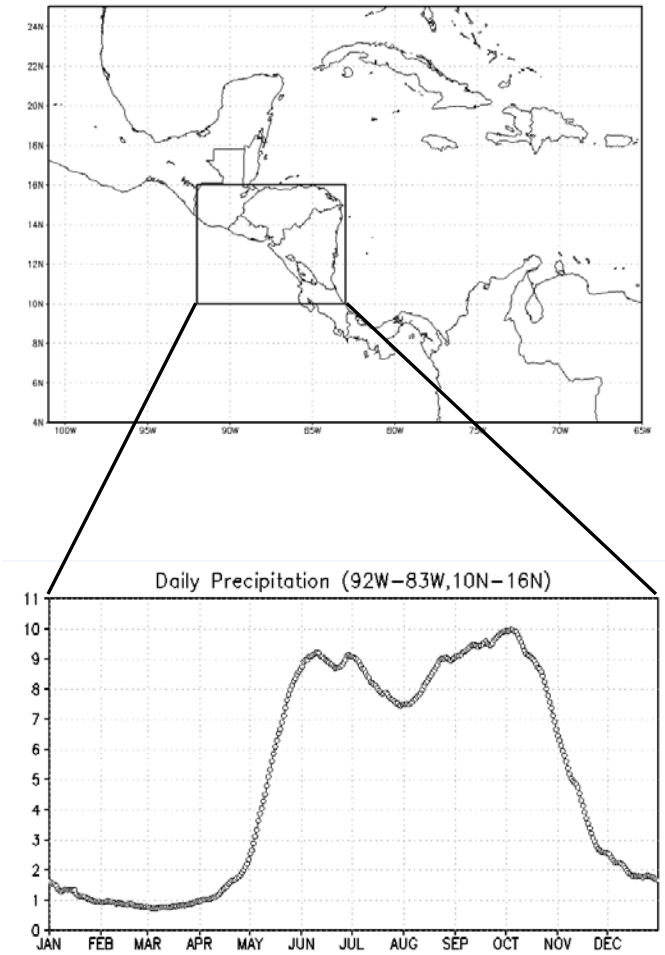


Country	Commodity	Contribution of *Primera* season to annual prod. (%)	Loss, in quintals (46kg/quintal)	Expected *Primera* 2014 production vs 2013†
El Salvador	White maize	85	2,600,000	-14.0
	Red beans	15	86,107	-20.0
Honduras	White maize	80	1,666,675	-17.0
	Red beans	30	180,159	-44.0
Nicaragua	White maize	60	5,879,926	-75.0
	Red beans	30	1,056,328	-75.0
Guatemala	White maize	60	1,890,559	-9.0
	Black beans	40	661,695	-66.2

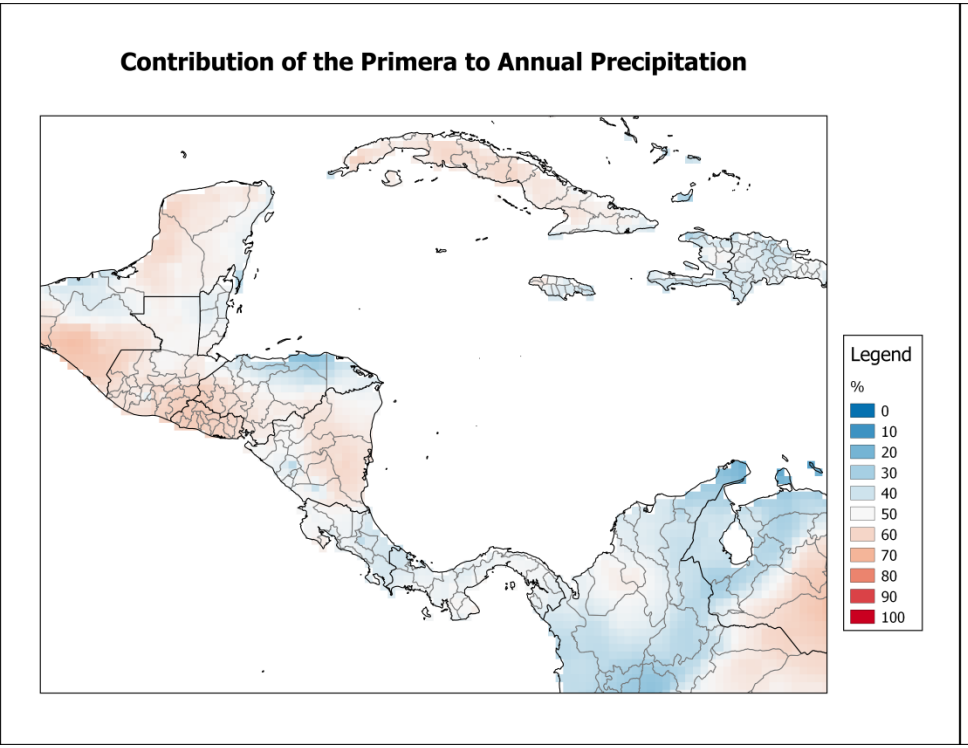
Source: FEWS NET, August 2014

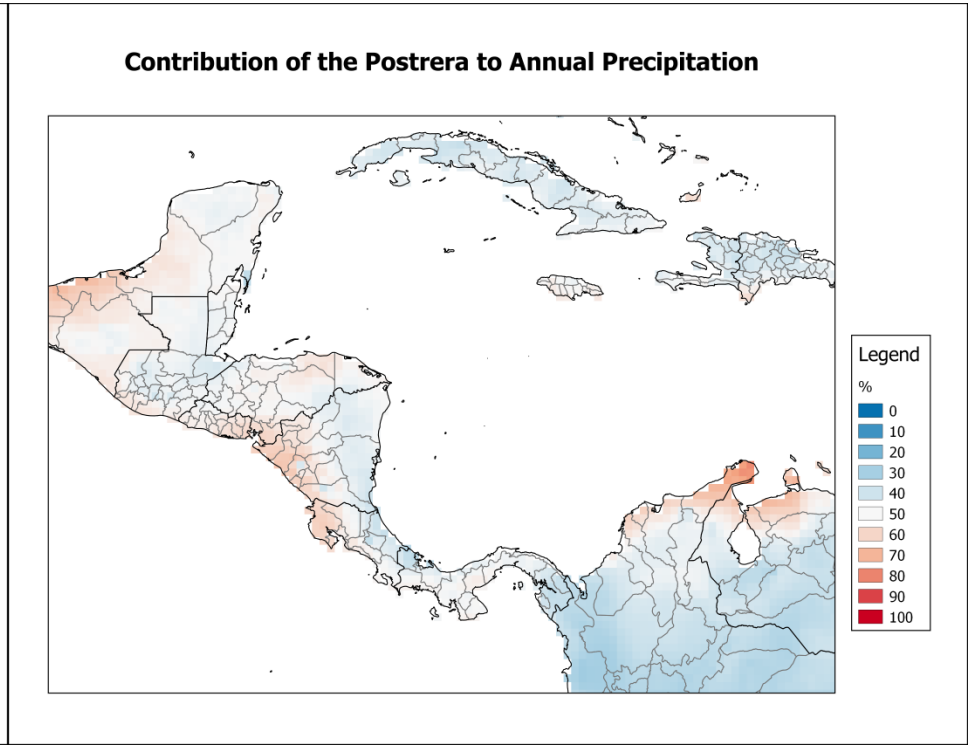
Annual Cycle of Precipitation



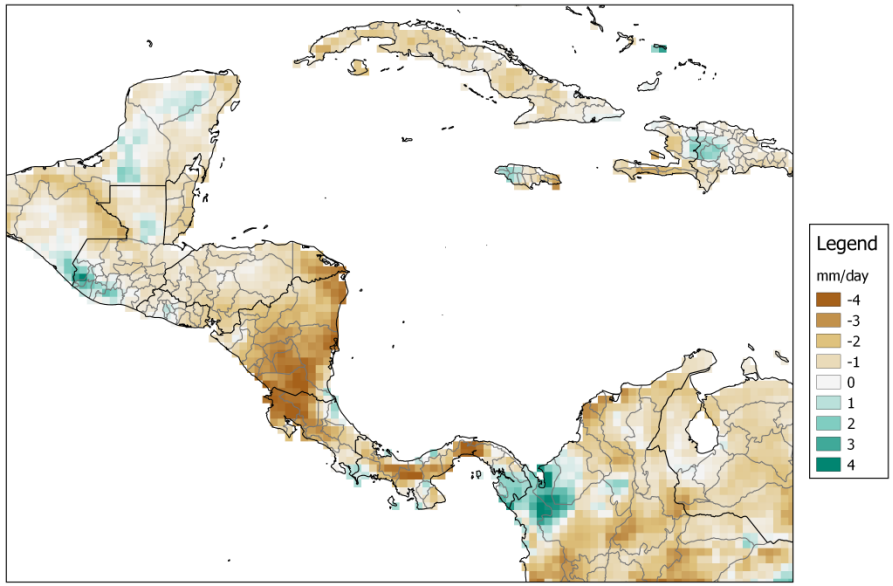


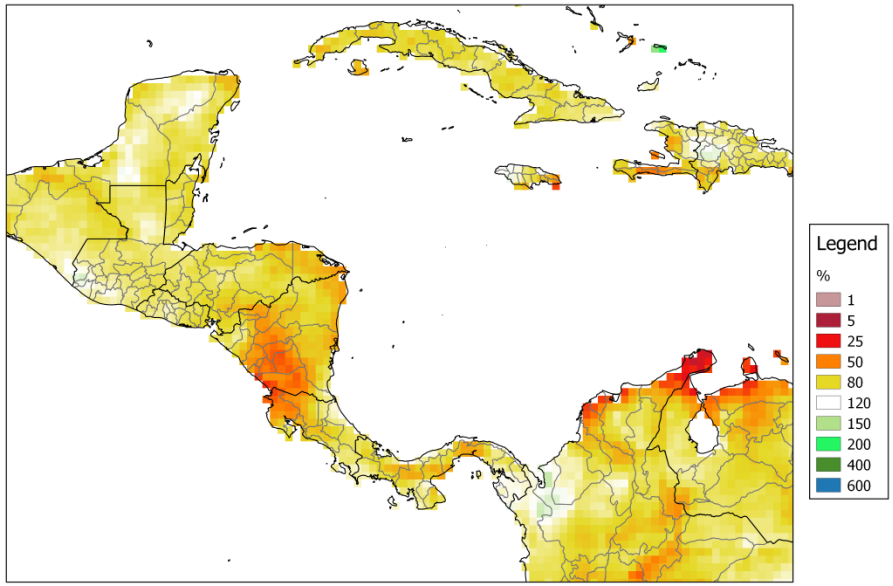
Contribution to Annual Totals



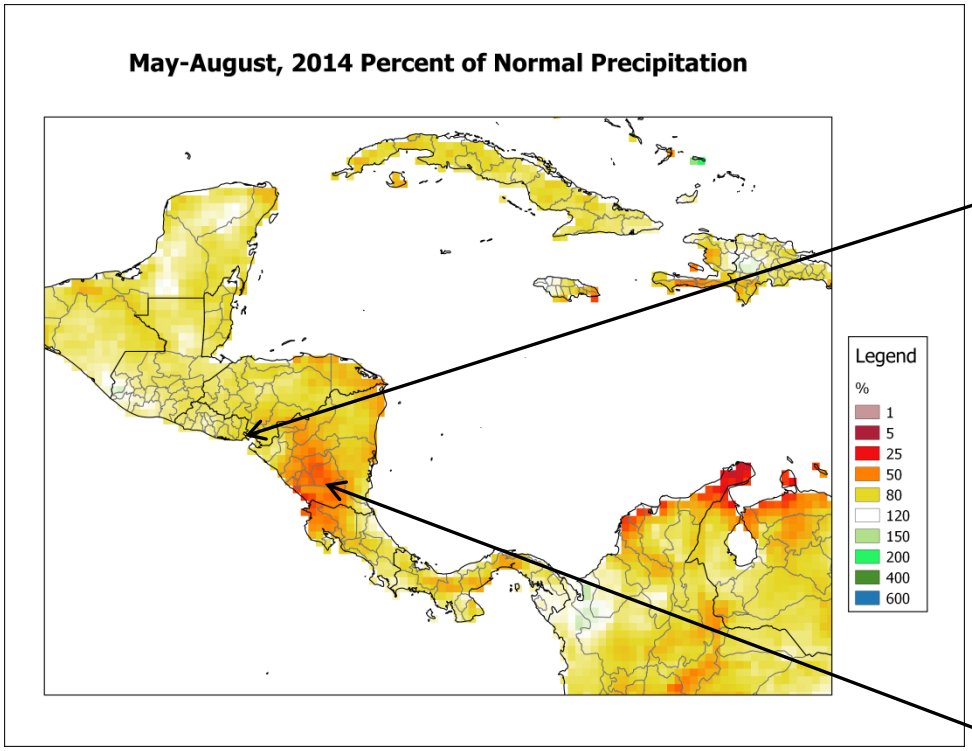


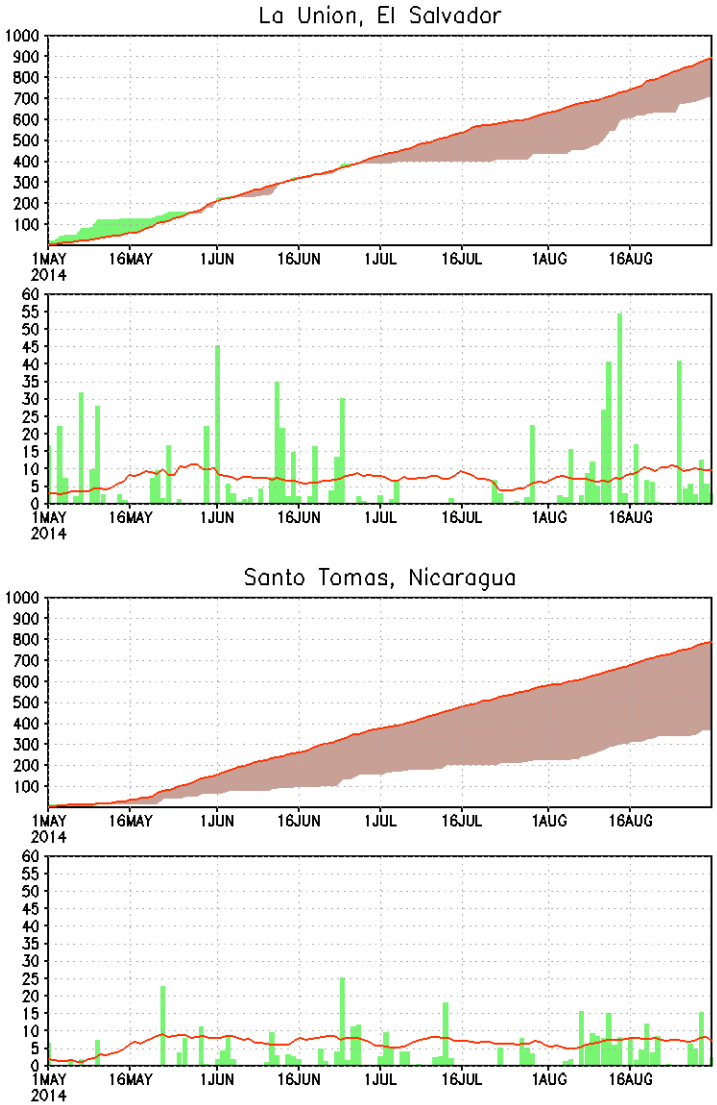
2014 Primera Anomalies



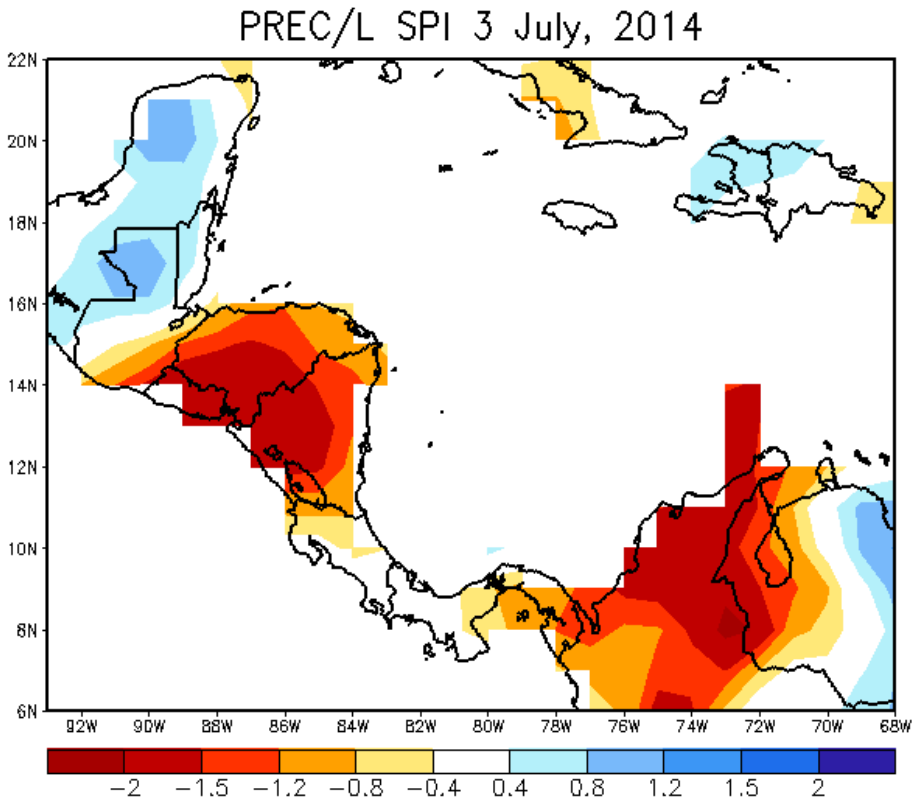


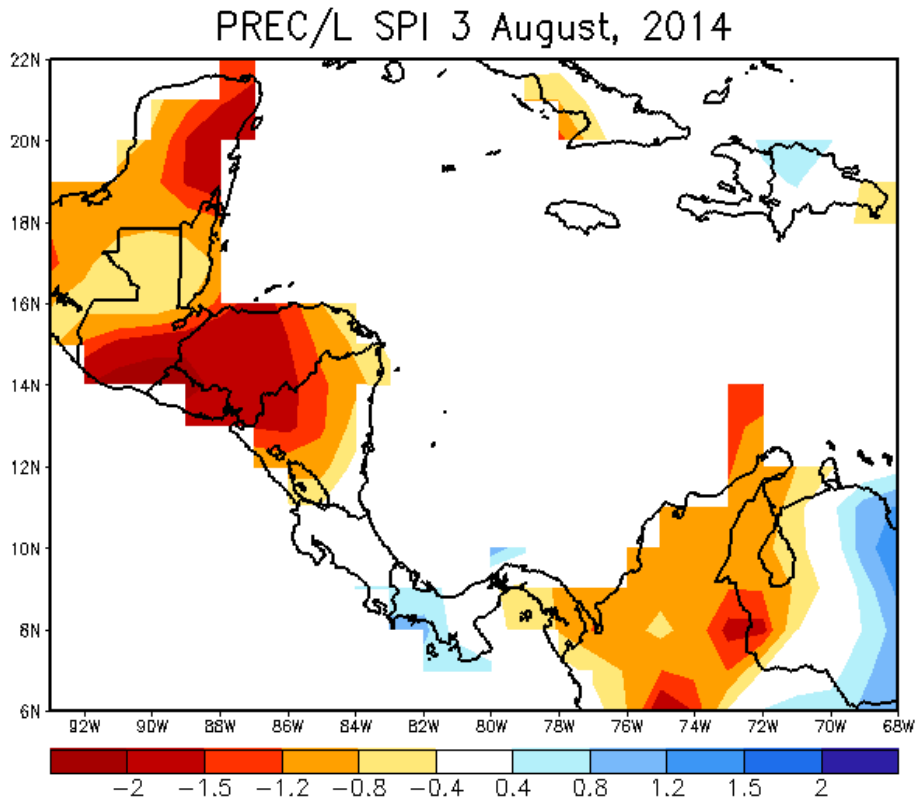
Precipitation Time Series



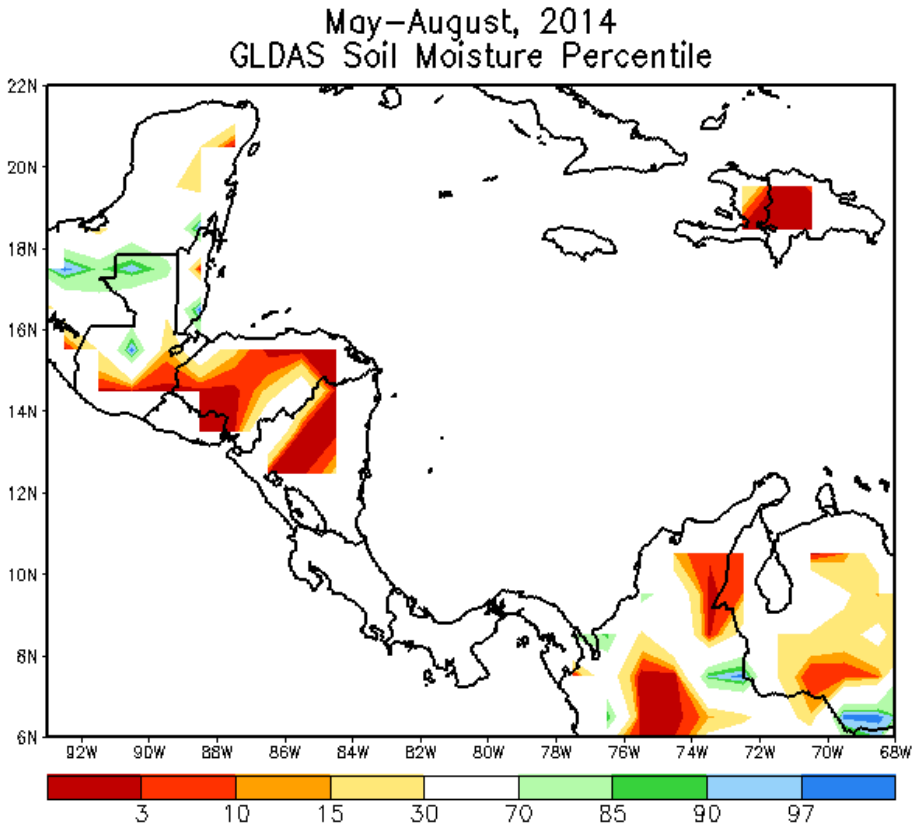


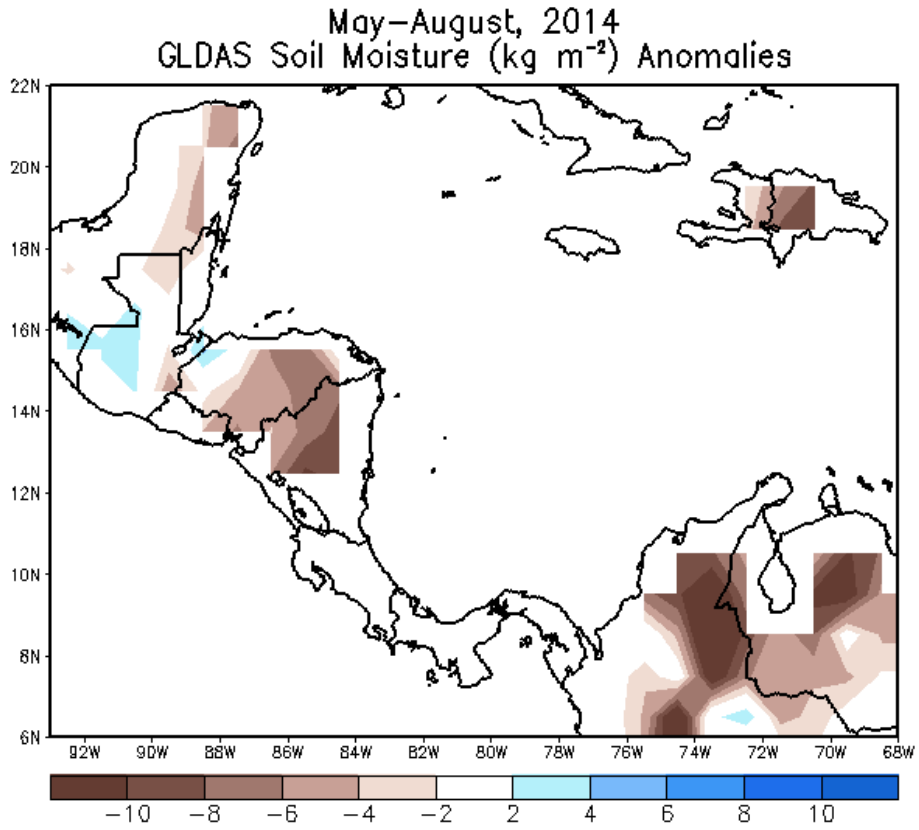
Standardized Precipitation Index



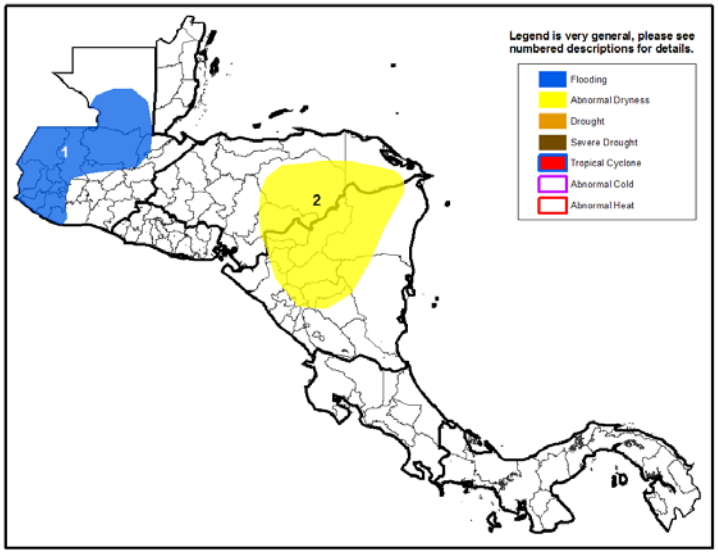


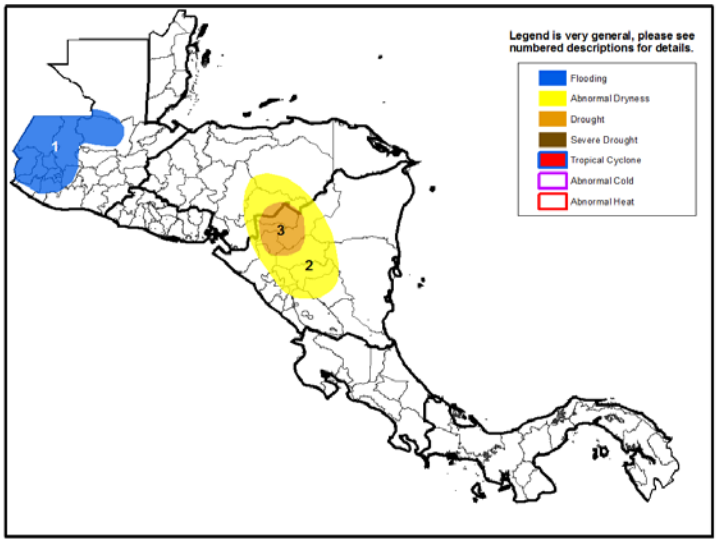
Soil Moisture Anomalies

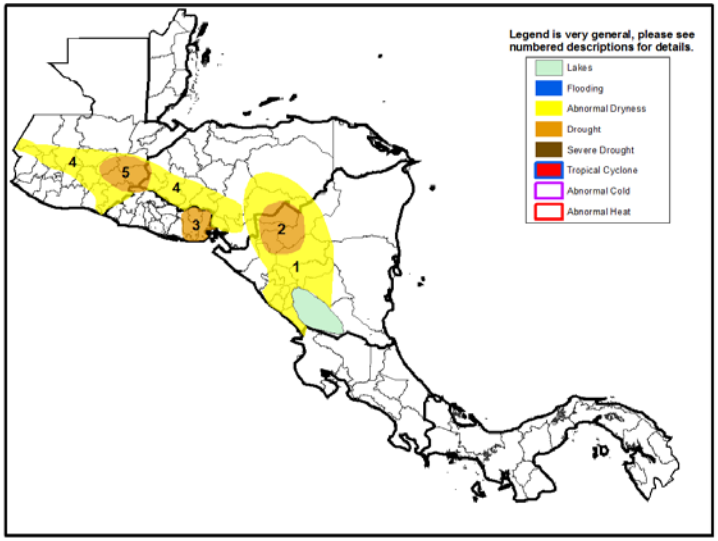


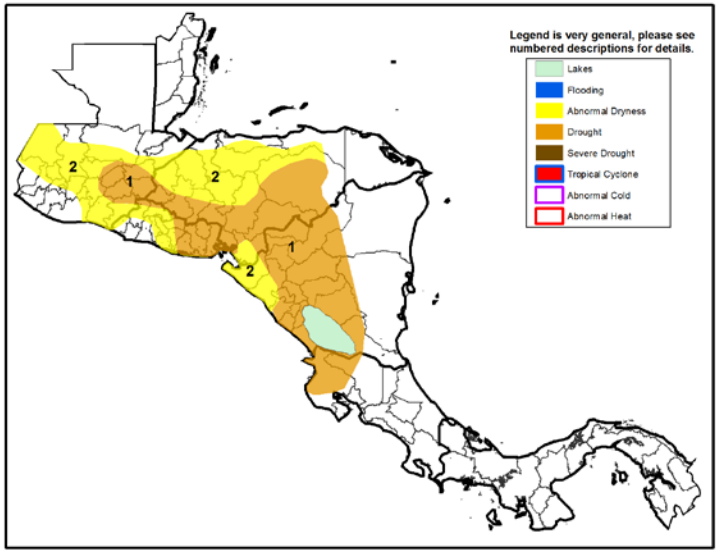


International Desks Hazards

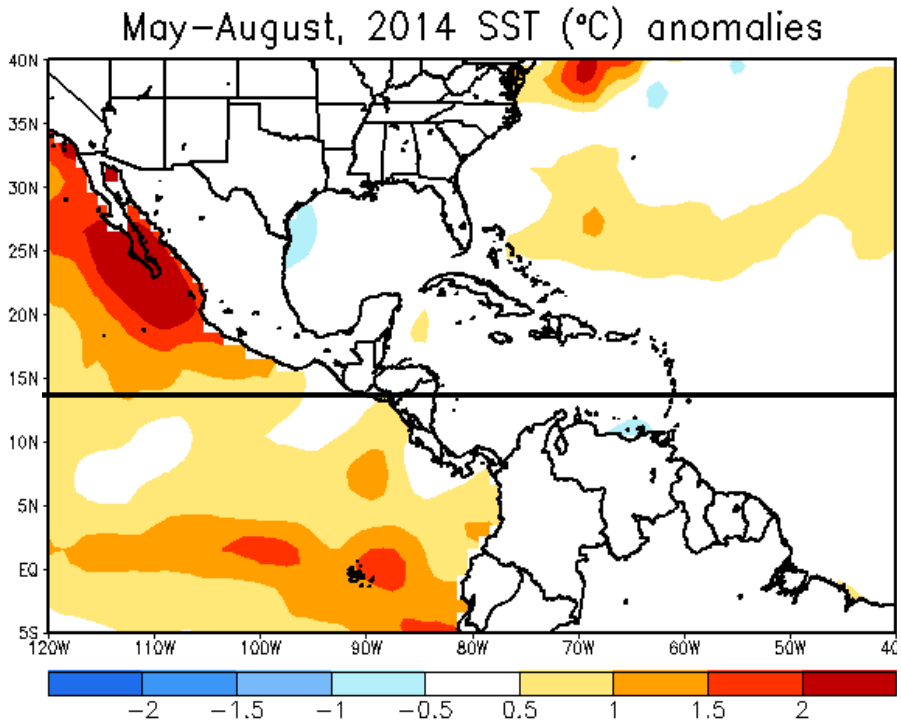


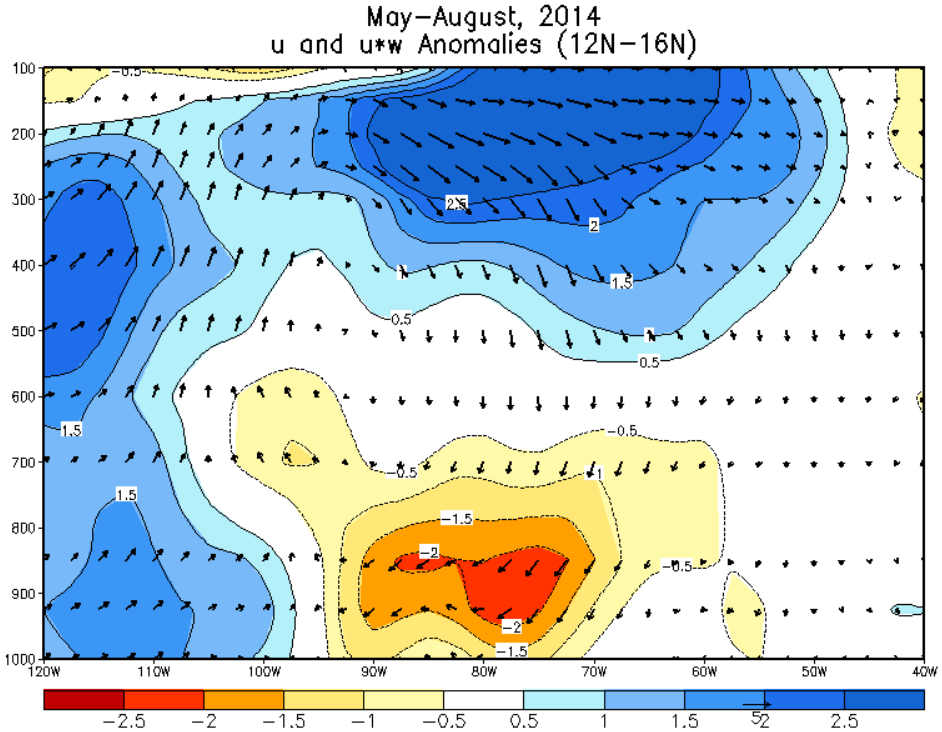




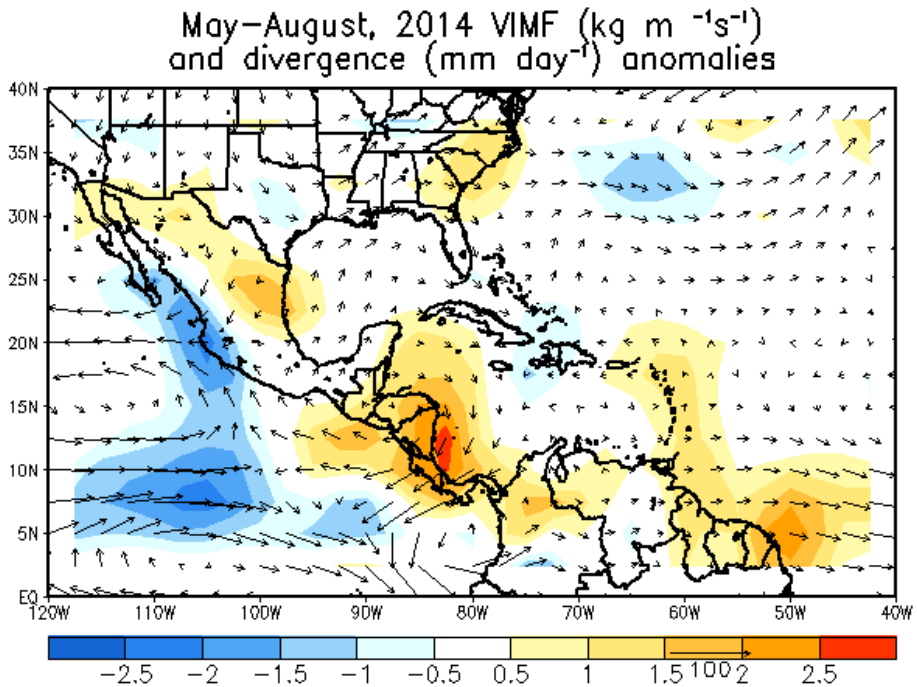


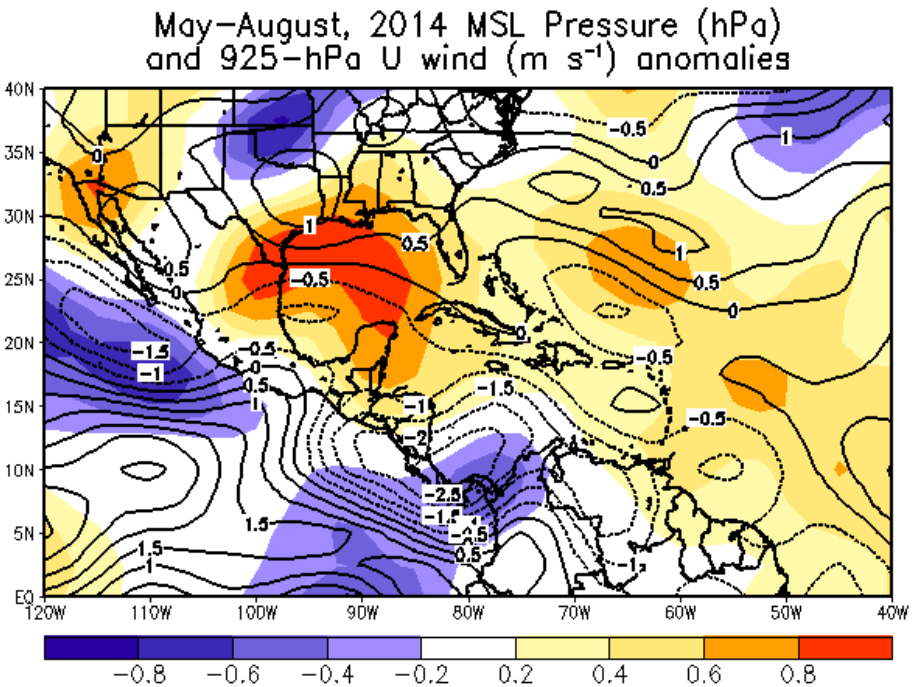
SST Anomalies and Lon-Height X



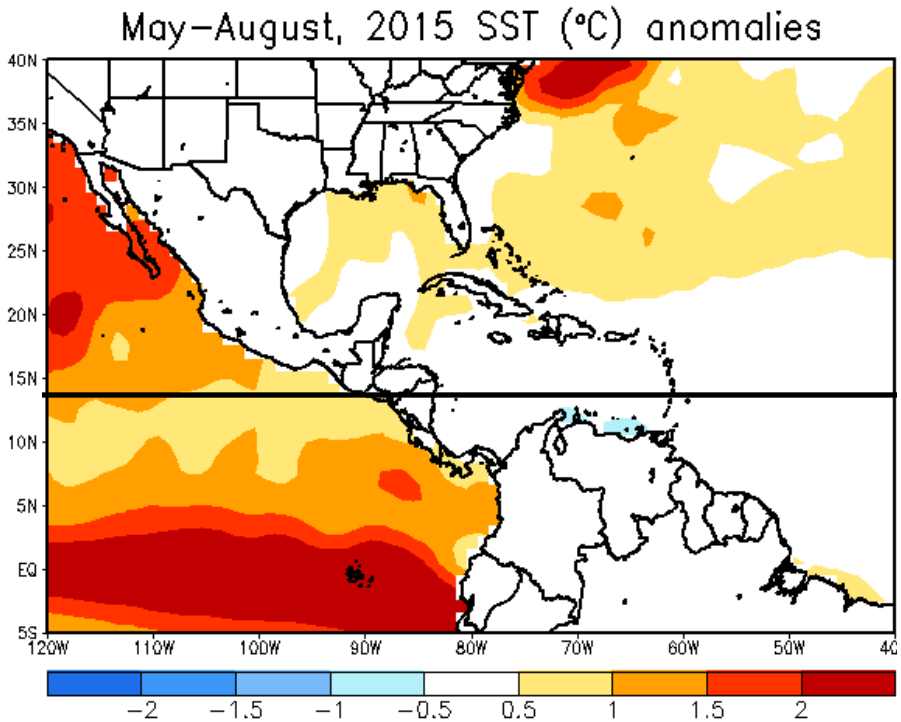


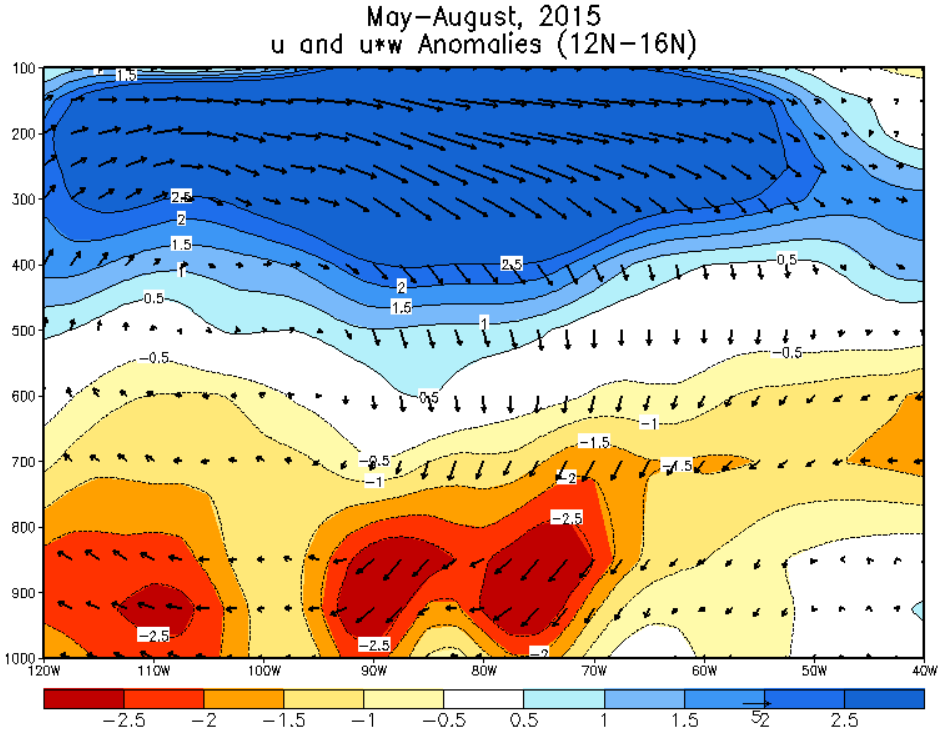
Moisture Transport and Circulation





2015 Primera Drought

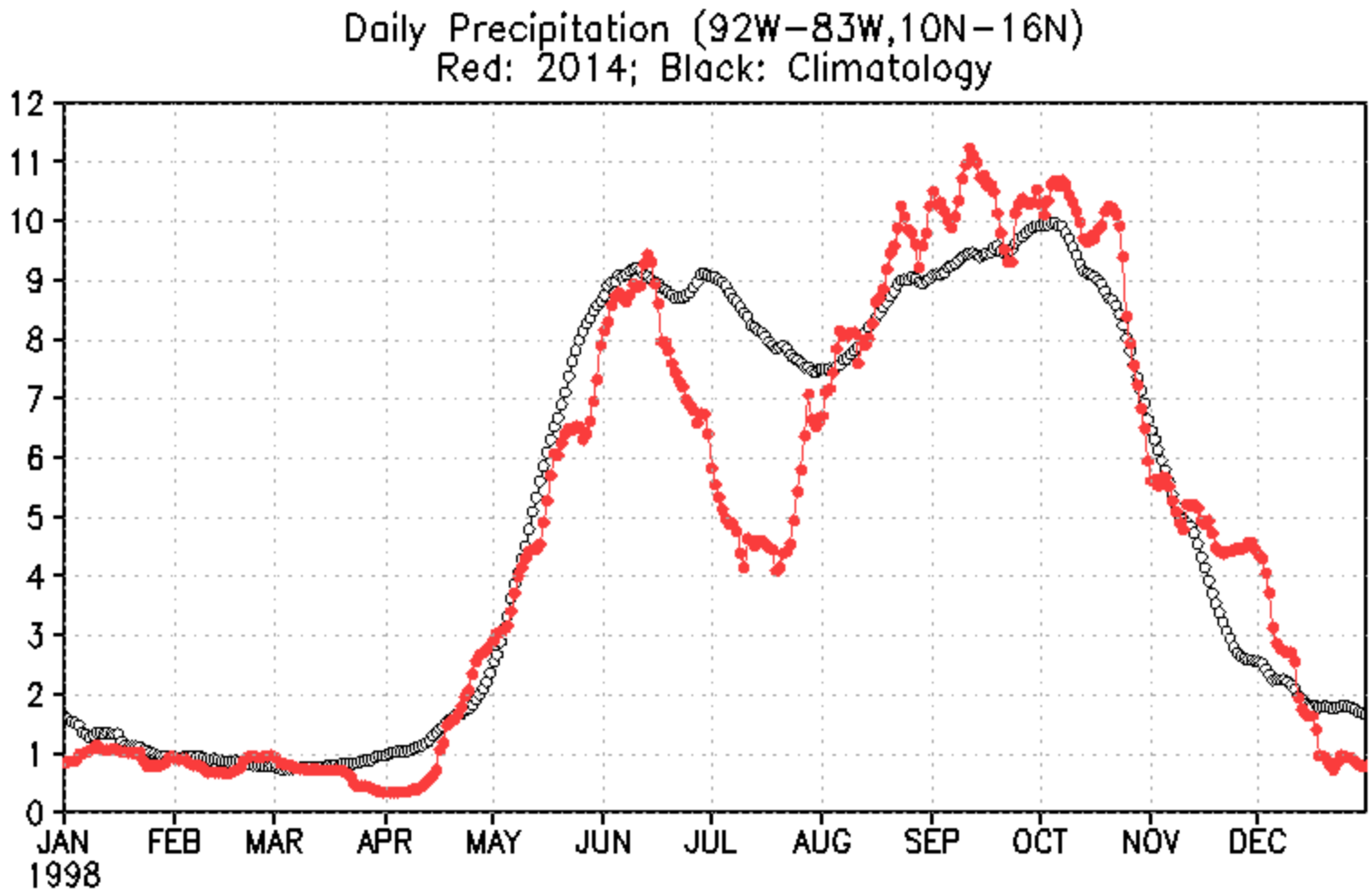




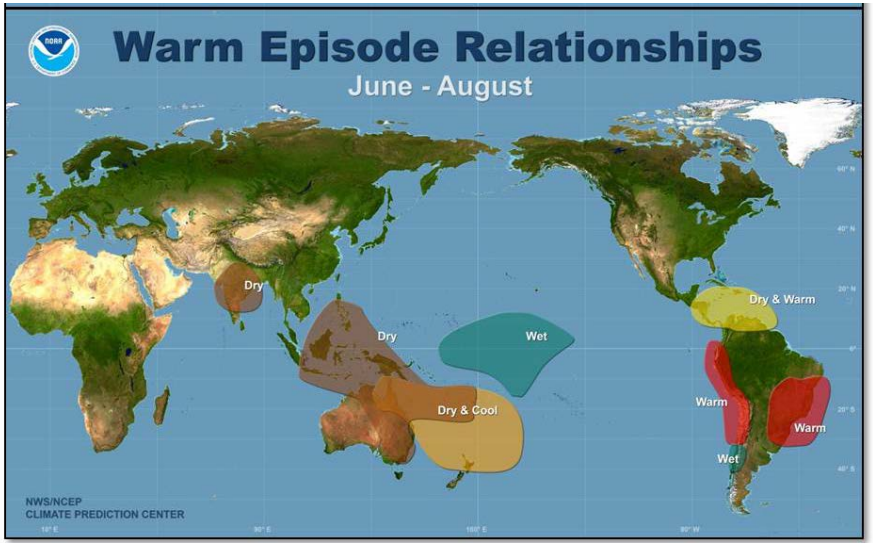
Summary

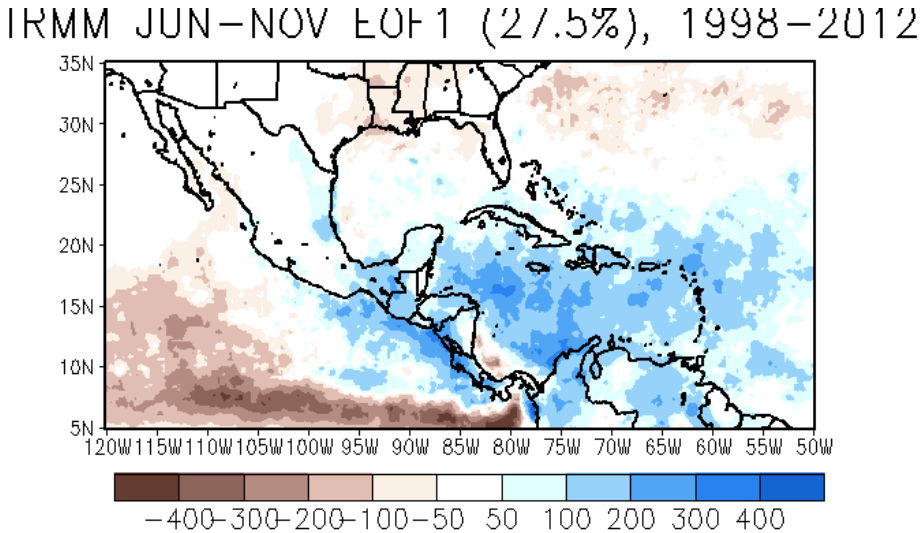
- **The 2014 drought led to major economic losses.**
- **Widespread below-average rain (< 80% of normal)**
- **Early onset and extended *Canicula***
- **Anomalous moisture divergence, westward excursion of the North Atlantic subtropical high, and stronger Caribbean low-level jet**
- **Warmer sea-surface temperatures limited over the Northeastern Tropical Pacific and anomalous subsidence over CA**
- **Warm Pacific and relatively cool Atlantic related to drought over Central America (Ropelewski and Halpert 1987; Waylen and Quesada 2002; Magana et al. 2003)**

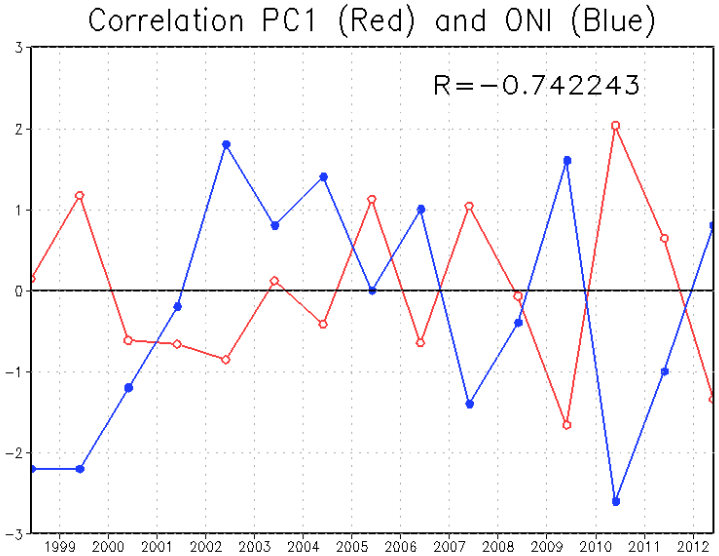
Thank you


Daily Precipitation (92W–83W,10N–16N)
Red: 2014; Black: Climatology
12
11
10
9
8
7
6
5
4
3
2
1
0
JAN
1998
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC

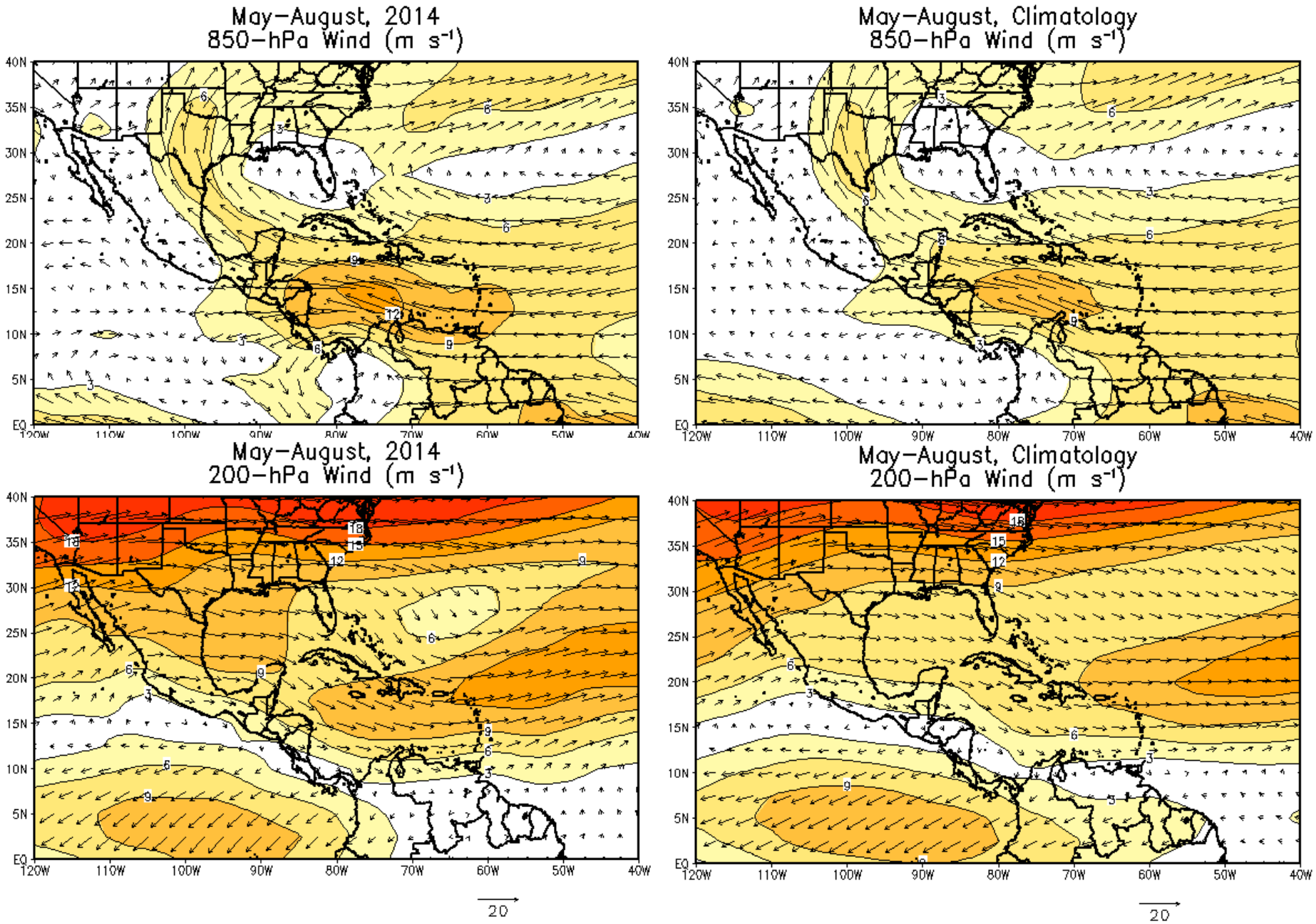
El Nino and CA Precipitation



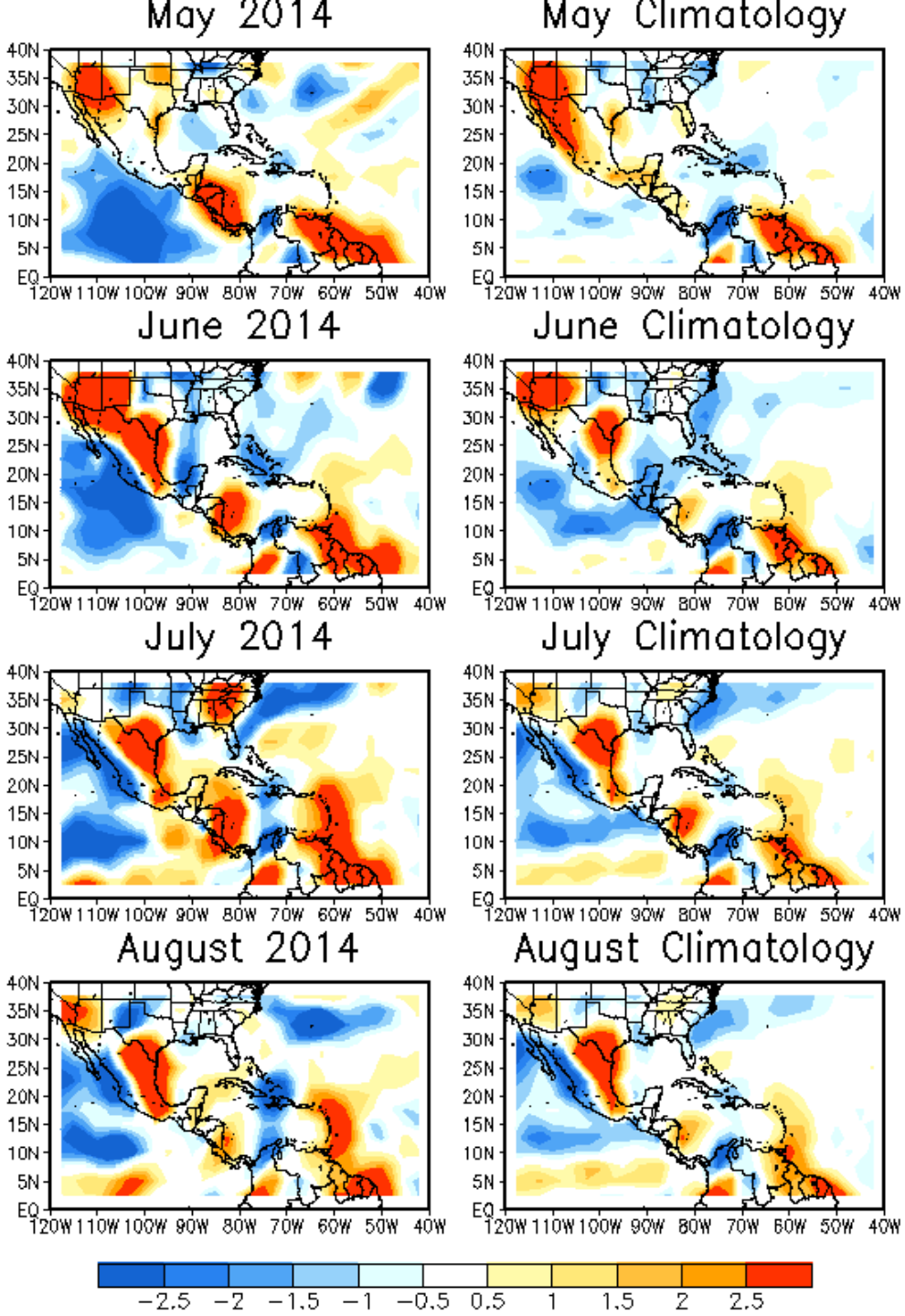


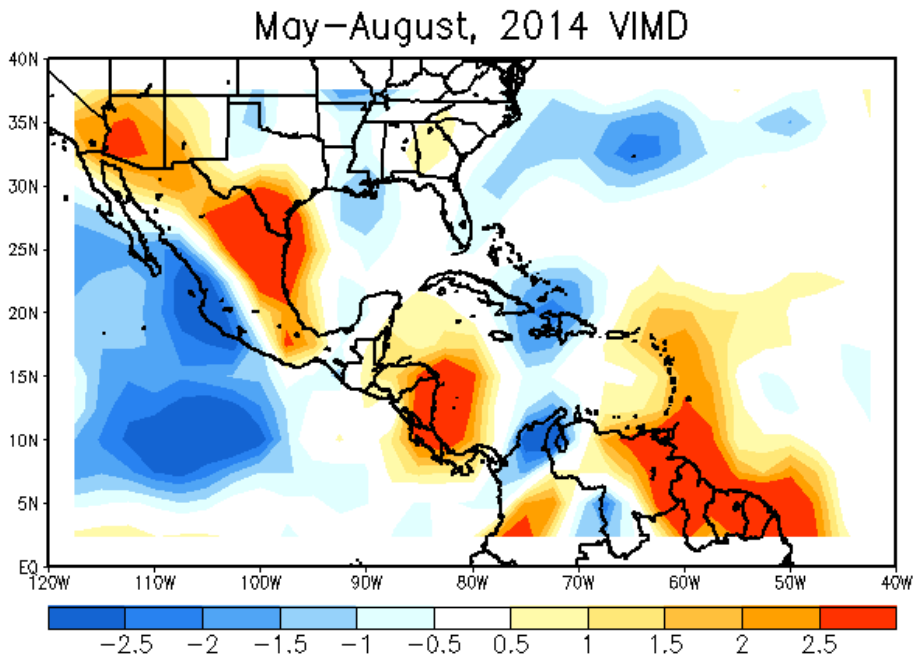


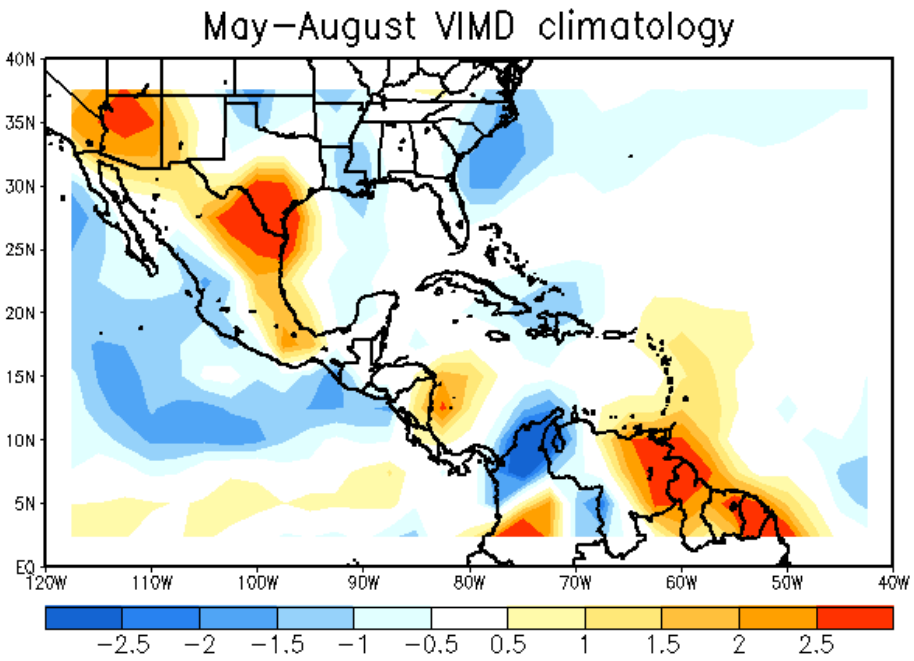
ONI is scaled by a factor of 2

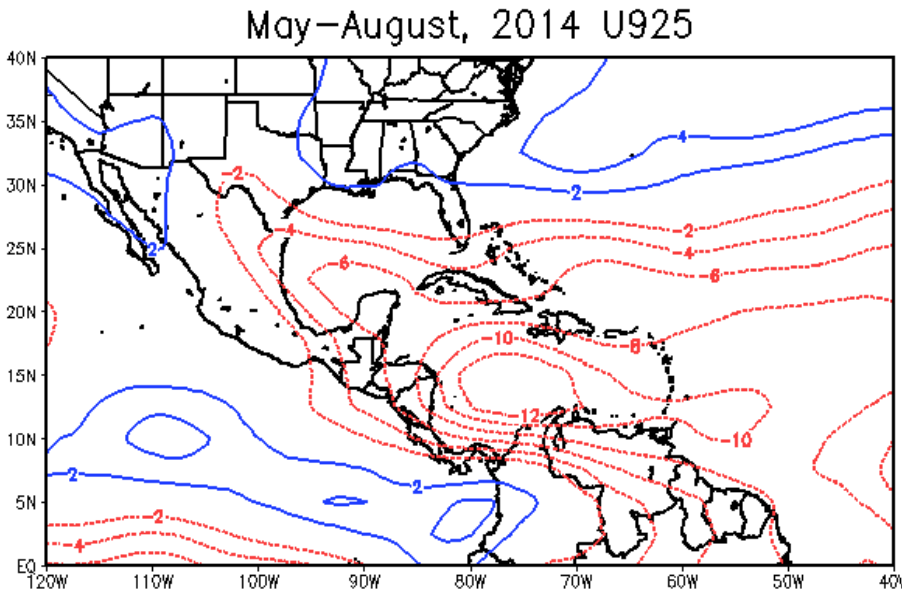

May–August, 2014
850–hPa Wind (m s⁻¹)
May–August, Climatology
850–hPa Wind (m s⁻¹)
May–August, 2014
200–hPa Wind (m s⁻¹)
May–August, Climatology
200–hPa Wind (m s⁻¹)
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W
20
3
6
9
12
15
18

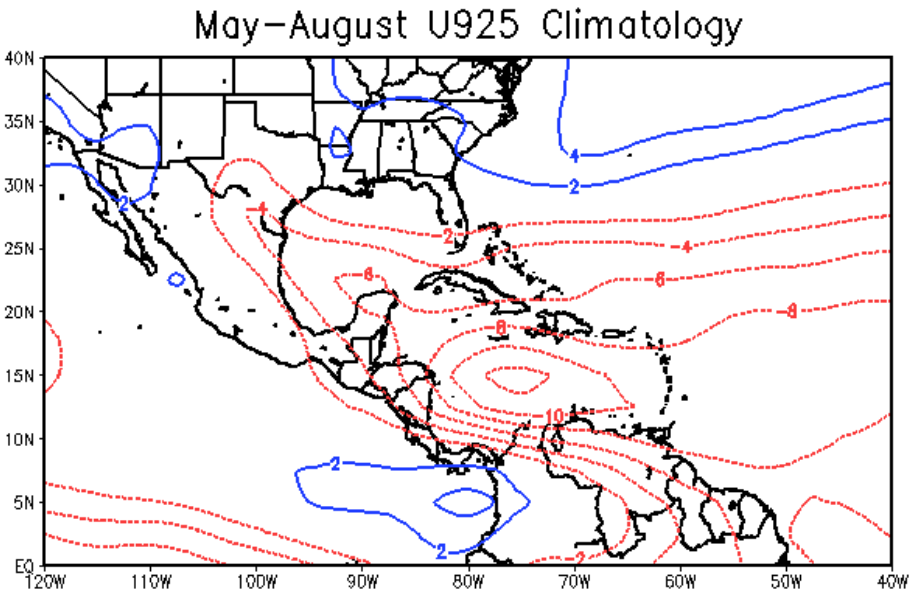
VIMD


May 2014
May Climatology
June 2014
June Climatology
July 2014
July Climatology
August 2014
August Climatology
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W 110W 100W 90W 80W 70W 60W 50W 40W
−2.5 −2 −1.5 −1 −0.5 0.5 1 1.5 2 2.5

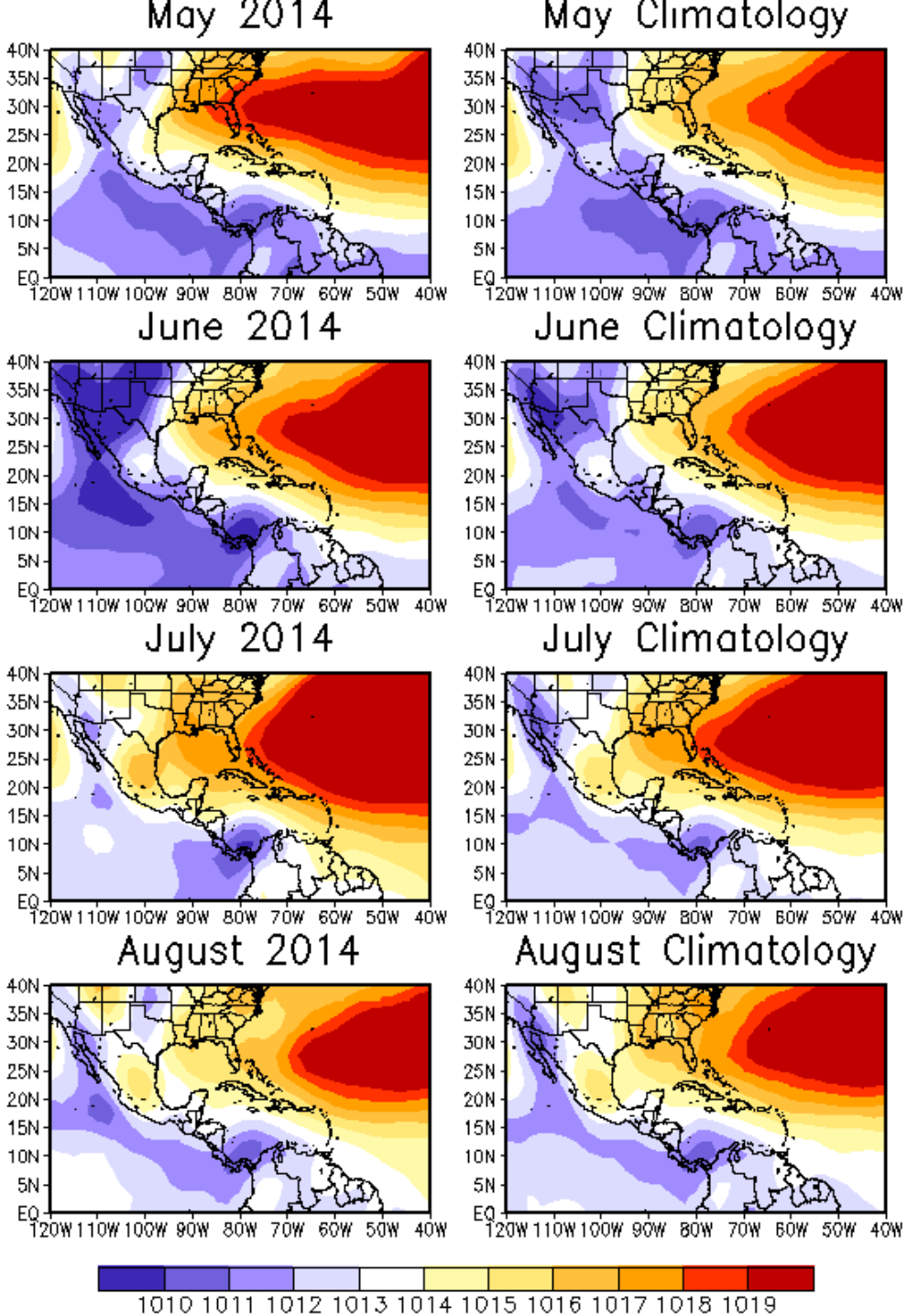

May–August, 2014 VIMD
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W
−2.5
−2
−1.5
−1
−0.5
0.5
1
1.5
2
2.5


May–August VIMD climatology
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W
−2.5
−2
−1.5
−1
−0.5
0.5
1
1.5
2
2.5

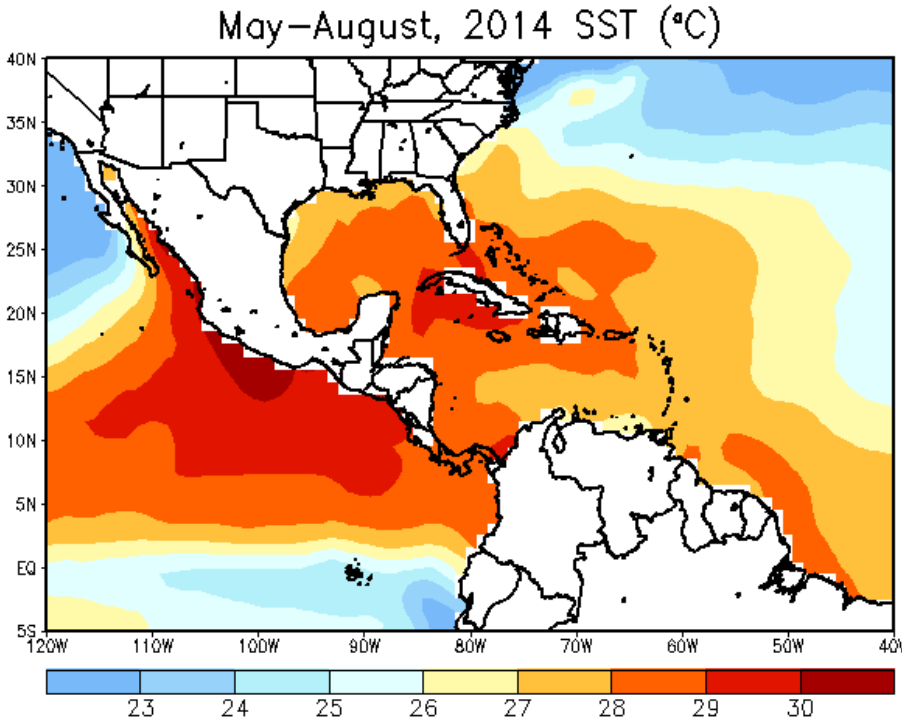

May–August, 2014 U925
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W

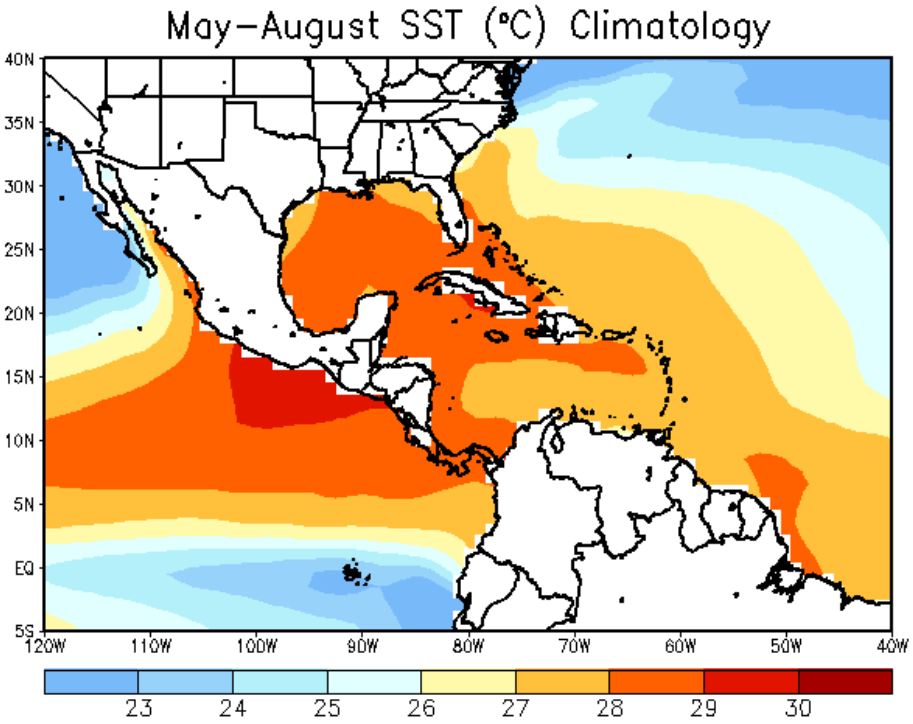

May–August U925 Climatology
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W

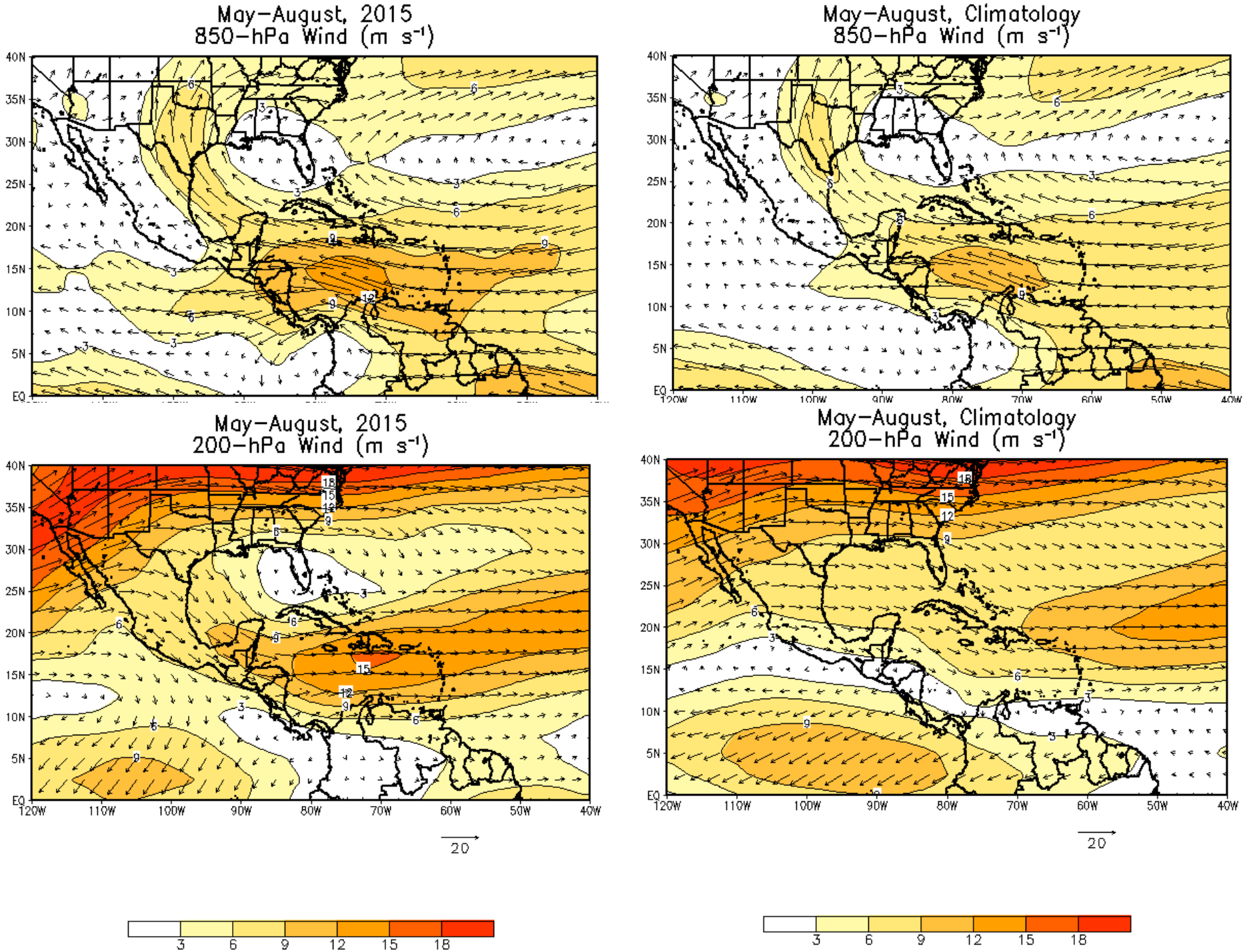
PRESMSL

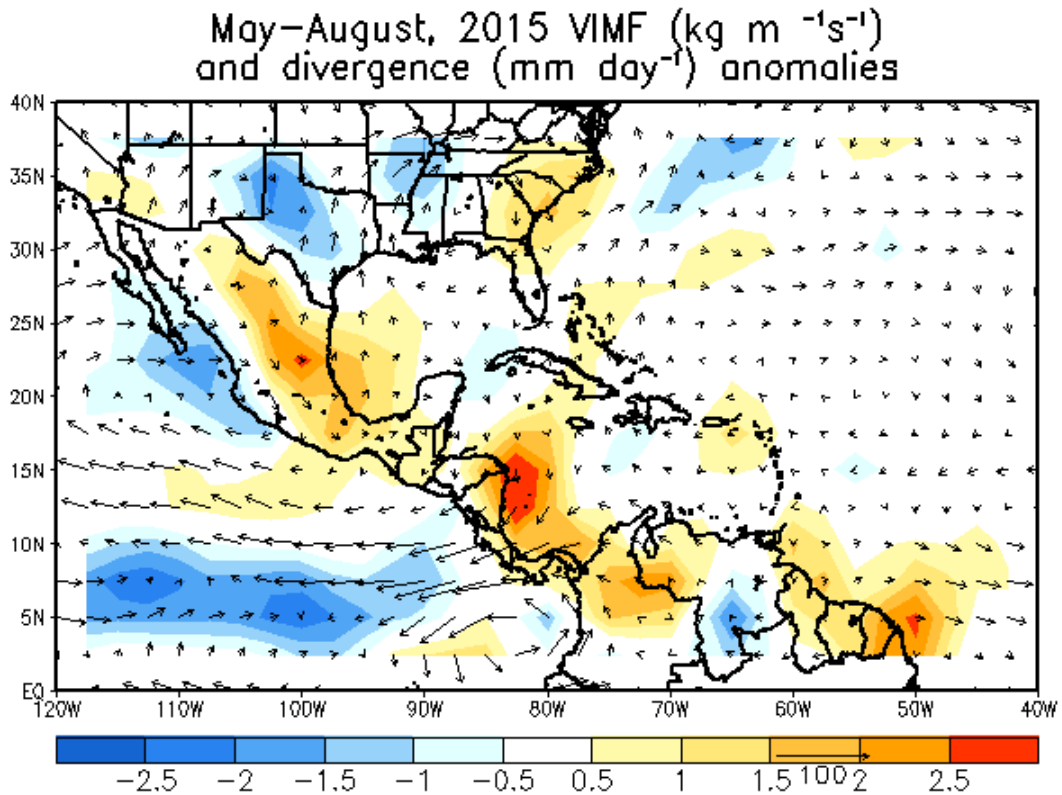

May 2014
May Climatology
June 2014
June Climatology
July 2014
July Climatology
August 2014
August Climatology
40N 35N 30N 25N 20N 15N 10N 5N EQ
120W 110W 100W 90W 80W 70W 60W 50W 40W
1010 1011 1012 1013 1014 1015 1016 1017 1018 1019

OI SST


May–August, 2014 SST (°C)
40N
35N
30N
25N
20N
15N
10N
5N
EQ
5S
120W
110W
100W
90W
80W
70W
60W
50W
23
24
25
26
27
28
29
30


May–August SST (°C) Climatology
40N
35N
30N
25N
20N
15N
10N
5N
EQ
5S
120W
110W
100W
90W
80W
70W
60W
50W
40W
23
24
25
26
27
28
29
30


May–August, 2015
850–hPa Wind (m s⁻¹)
May–August, Climatology
850–hPa Wind (m s⁻¹)
May–August, 2015
200–hPa Wind (m s⁻¹)
May–August, Climatology
200–hPa Wind (m s⁻¹)
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W
20
3
6
9
12
15
18


May–August, 2015 VIMF (kg m ⁻¹s⁻¹)
and divergence (mm day⁻¹) anomalies
40N
35N
30N
25N
20N
15N
10N
5N
EQ
120W
110W
100W
90W
80W
70W
60W
50W
40W
−2.5
−2
−1.5
−1
−0.5
0.5
1
1.5
100
2
2.5