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CYCLES OF MAJOR US LANDFALLING HURRICANES

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Are there cycles of major [Category 3, 4, or 5] hurricanes that make landfall along the US Coast? The landfalls of major US hurricanes by decades from 1851 to 2000 were sorted and plotted. When the decades were grouped into three periods, a pattern became apparent of where the major hurricanes made landfall. Figures 1a, 1b, and 1c show the landfall of the major hurricanes since 1851 by decade. Period 1 include the decades which started in 1851, 1881, 1911, 1941, 1971, and 2001. Notice that most of the major hurricanes that made landfall on the US coast were in the Gulf of Mexico. Period 2 include the decades that included 1861, 1891, 1921, 1951, 1981 and 2011. Looking at Figures 1a to 1c, notice the major hurricanes in Period 2 tend to make landfall along the east coast of the US. Period 3 include the decades which start in 1871, 1901, 1931, 1961, and 1991. Notice the major hurricanes have returned to the Gulf of Mexico during these decades with a few major hurricanes making landfall along the east coast of the US.

The number of major hurricanes that made landfall along the Gulf of Mexico coast, the east coast of Florida, and the East coast of the US were counted per decade. The summary of the count appear in Table 1. This table shows the major hurricanes sorted by decade since 1851. The major hurricanes decades are then sorted into three periods. When this is done, the periods show that the major hurricanes tend to make landfall along the Gulf of Mexico coast in the first Period. Then the major hurricanes tend to turn to the north and make landfall in the east coast of the US in period 2. During the third period, they tend to make landfall in the Gulf of Mexico with a few still turning north and making landfall along the east coast of the US. In Figure 1a-1c, GOM is for landfall along the Gulf of Mexico Coast, EFL is for the East Coast of Florida, and EC is for the East Coast of the United States. The numbers in the Figure indicate the number of major landfalling hurricanes in these sections of the coast.

The number of major hurricanes were sorted into the 3 decadal periods and appear in Table 1. The number of major hurricanes that made landfall in the three regions, Gulf of Mexico, East coast of Florida, and the East coast of the United States were tallied, then the average for each landfall region were computed for each of the three periods. These are summarized in Table 1. This table shows there were five decades in each of the three periods.

When considering the average of the number of major landfalling hurricanes, the average number of major hurricanes making landfall in Period 1 in the Gulf of Mexico was 4.8 hurricanes, one major hurricane along the east coast of Florida and less than one along the East Coast of the US. When you review the decade of 2001 to 2010, there were six major hurricanes which made landfall in the Gulf of Mexico, one major hurricane made landfall along

the east coast of Florida and no major hurricane made landfall along the east coast in this decade.

Currently, we are in Period 2, 2011 to 2020. We would expect the major hurricanes to turn to the north and move up the east coast until 2020. This seems to be the trend with Irene in 2011, Sandy in 2012 and Matthew in 2016. Period 3 would start in 2021 when the landfall of major hurricanes would return to the Gulf of Mexico.

PERIOD 1

PERIOD 2

PERIOD 3

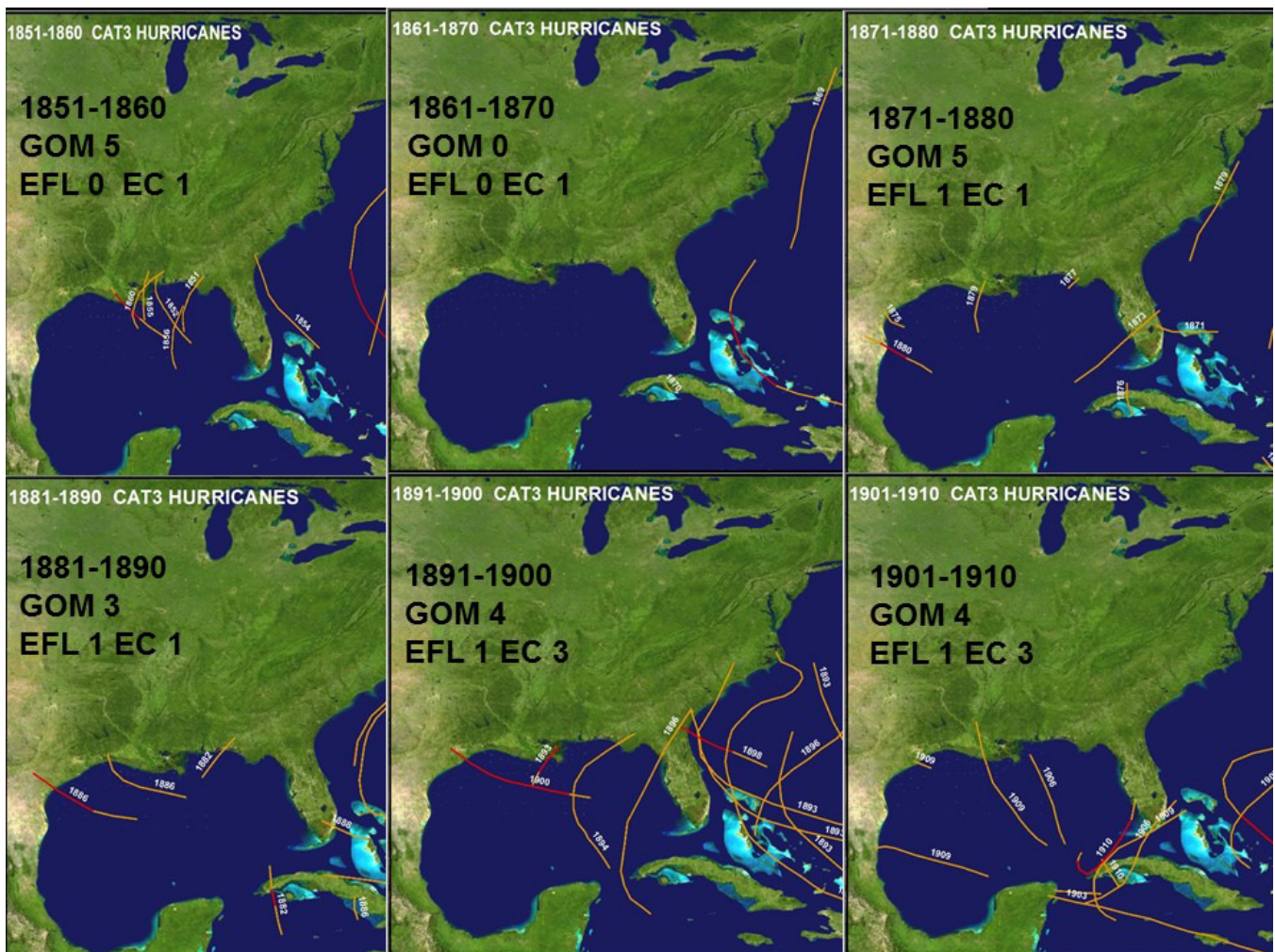


Figure 1a: Tracks of the major US landfalling hurricanes by decade.

PERIOD 1

PERIOD 2

PERIOD 3

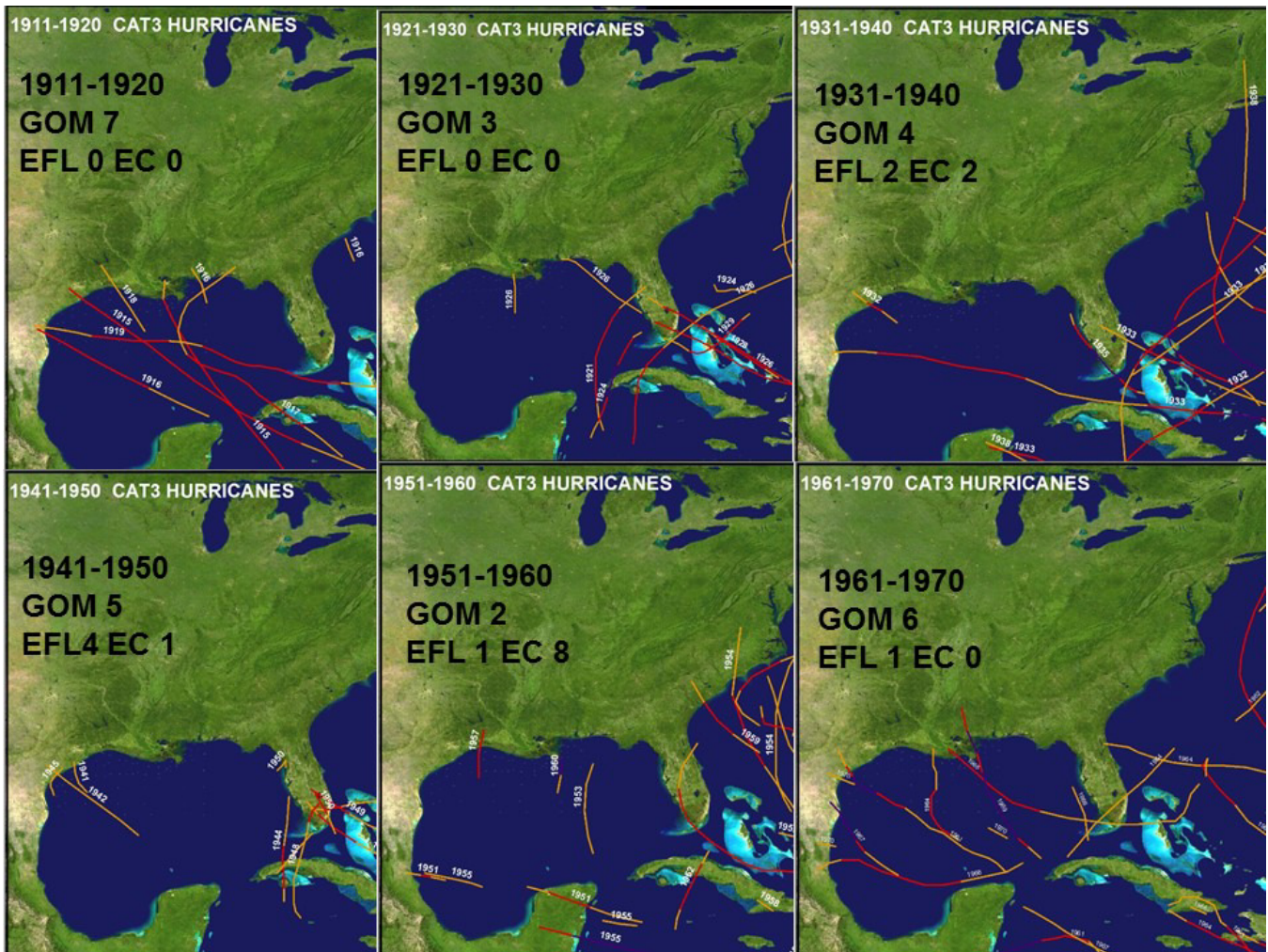


Figure 1b: Tracks of the major US landfalling hurricanes by decade.

PERIOD 1

PERIOD 2

PERIOD 3



Figure 1c. Plot of major US landfalling hurricanes by decade.

Table 1: Number of Major Landfalling Hurricanes for each Decade

PERIOD 1			PERIOD 2			Period 3		
1851-1860			1861-1870			1871-1880		
GOM	EFL	EC	GOM	EFL	EC	GOM	EFL	EC
5	0	1	0	0	1	5	1	1
1881-1890			1891-1900			1901-1910		
3	1	1	4	1	3	4	0	0
1911-1920			1921-1930			1931-1940		
7	0	0	3	3	0	4	2	2
1941-1950			1951-1960			1961-1970		
5	4	1	2	1	8	6	1	0
1971-1980			1981-1990			1991-2000		
4	0	0	2	0	2	3	1	2
AVERAGE			AVERAGE			AVERAGE		
24	5	3	11	5	14	22	5	5
GOM	EFL	EC	GOM	EFL	EC	GOM	EFL	EC
4.8	1	0.6	2.2	1	2.8	4.4	1	1
2001-2010			2011-2020			2021-2030		
GOM	EFL	EC	GOM	EFL	EC	GOM	EFL	EC
6	1	0		1	2			