

National Oceanic and Atmospheric Administration (NOAA) Atlantic and Eastern Pacific Hurricane Season Forecasts

The National Oceanic and Atmospheric Administration (NOAA) has issued its forecast for the 2021 Atlantic and Eastern Pacific Hurricane Seasons. Forecasters within the U.S. governmental agency are forecasting **13-20 named storms, 6-10 hurricanes, and 3-5 major hurricanes (Category 3+)** between the months of June and November for the Atlantic Basin. The agency expects **12-18 named storms, 5-10 hurricanes, and 2-5 major hurricanes (Category 3+)** between mid-May and November for the Eastern Pacific Basin.

ATLANTIC BASIN FORECAST REASONING

NOAA's report indicates that there are three main factors for the Atlantic hurricane season forecast, which suggests above-normal activity:

- An anticipated continuation of ENSO-neutral conditions (no El Niño or La Niña), though the forecast models do suggest a possible return of La Niña during the peak development months of August, September, and October. ENSO-neutral does not inhibit tropical storm or hurricane formation, nor does it suppress the high-activity era conditions.
- Should a La Niña develop, and current model probabilities are 42 percent of this happening, this would enhance atmospheric (low wind shear) and oceanic (warmer-than-normal sea surface temperature) conditions in the Atlantic Ocean's Main Development Region (MDR) that typically lead to more cyclogenesis. It would also likely mean seasonal activity at the upper end of NOAA's predicted ranges.
- The set of atmospheric and oceanic conditions that have produced the ongoing high-activity era for Atlantic hurricanes since 1995 are largely still in place. As noted previously, this includes warmer sea surface temperatures and weaker trade winds in the MDR.

NOAA provides the following probabilities for the 2021 Atlantic Hurricane Season: 60 percent of an above-normal season, a 30 percent chance of a near-normal season, and a 10 percent chance of a below-normal season.

If the 2021 Atlantic Hurricane Season ends above average, it would extend the current record (5) consecutive above-normal seasons to six (6). Since the current Atlantic high-activity era began in 1995, 18 of 26 (69 percent) of seasons have been above normal and only four (15 percent) have been below normal.

As always, it is critical to be aware of the inherent risks with any developing tropical cyclone and its potential threat to land. It only takes one storm to completely alter the perception and the totality of impact to lives and livelihoods during a season.

EASTERN PACIFIC BASIN FORECAST REASONING

NOAA indicates that the 2021 season will likely be near average for the Eastern Pacific Basin, and lists two main factors during the peak development months between July and September:

- Current and predicted sea surface temperature anomaly patterns indicate near-average values across the eastern Pacific hurricane region, which is tied to a current negative phase of the Pacific Decadal Oscillation (PDO). Subsequently, above-average warmers are likely in the Atlantic's Main Development Region (MDR). Such conditions are historically associated with near- or below-normal hurricane activity in the Central and Eastern Pacific basins.
- An anticipated continuation of ENSO-neutral conditions (no El Niño or La Niña), though a recognition that weak La Niña conditions are possible. ENSO-neutral does not inhibit tropical storm or hurricane formation, nor does it suppress the high-activity era conditions.
- Should a La Niña develop, this would reduce atmospheric (higher wind shear) and oceanic (cooler-than-normal sea surface temperature) conditions in the Eastern Pacific Ocean that typically lead to fewer storms. It would also likely mean seasonal activity at the lower end of NOAA's predicted ranges.

NOAA provides the following probabilities for the 2021 Eastern Pacific Hurricane Season: 20 percent of an above-normal season, 45 percent chance of a near-normal season, and a 35 percent chance of a below-normal season.

Tables on the next page show the NOAA forecasts. To view NOAA's historical seasonal forecast performance for the Atlantic Ocean Basin, please view the Appendix below. The full reports are available at the Climate Prediction Center's website, and the next Atlantic forecast update is expected in early August.

The Accumulated Cyclone Energy (ACE) Index is a measure used by NOAA to express the activity of individual tropical cyclones and entire tropical cyclone seasons. The index uses an approximation of the energy used by a tropical system over its lifetime and is calculated every six-hour period. A season's ACE is the sum of each storm's accumulated energy and considers the number, strength and duration of all tropical storms in a season.

Atlantic: <http://www.cpc.noaa.gov/products/outlooks/hurricane.shtml>

Eastern Pacific: http://www.cpc.ncep.noaa.gov/products/Epac_hurr/Epac_hurricane.html

NOAA Atlantic Basin Hurricane Season Forecast (June 1 – November 30)

Forecast Parameter	Average Year (1981-2010)	2021 (May 2021)
Named Storms	12	13-20
Hurricanes	6	6-10
Major Hurricanes	3	3-5
ACE Range (Median) – 1950-2020	75.4-130%	110-190%
Chance for an Above-Normal Hurricane Season	33%	60%
Chance for a Near-Normal Hurricane Season	33%	30%
Chance for a Below-Normal Hurricane Season	33%	10%

Source: NOAA

NOAA Eastern Pacific Basin Hurricane Season Forecast (May 15 – November 30)

Forecast Parameter	Average Year (1981-2010)	2021 (May 2021)
Named Storms	15	12-18
Hurricanes	8	5-10
Major Hurricanes	4	2-5
ACE Range (Median) – 1950-2020	80-115%	65-120%
Chance for an Above-Normal Hurricane Season	33%	20%
Chance for a Near-Normal Hurricane Season	33%	45%
Chance for a Below-Normal Hurricane Season	33%	35%

Source: NOAA

Appendix

Historical NOAA Atlantic Hurricane Season Forecast Validation Since 2000

Season	May NS	August NS	Actual NS	May HU	August HU	Actual HU	May MHU	August MHU	Actual MHU
2000		11	15		7	8		3	3
2001	8-11	9-12	15	5-7	6-8	9	2-3	2-4	4
2002	9-13	7-10	12	6-8	4-6	4	2-3	1-3	2
2003	11-15	12-15	16	6-9	7-9	7	2-4	3-4	3
2004	12-15	12-15	15	6-8	6-8	9	2-4	2-4	6
2005	12-15	18-21	28	7-9	9-11	15	3-5	5-7	7
2006	13-16	12-15	10	8-10	7-9	5	4-6	3-4	2
2007	13-17	13-16	15	7-10	7-9	6	3-5	3-5	2
2008	12-16	14-18	16	6-9	7-10	8	2-5	3-6	5
2009	9-14	7-11	9	4-7	3-6	3	1-3	1-2	2
2010	14-23	14-20	19	8-14	8-12	12	3-7	4-6	5
2011	12-18	14-19	19	6-10	7-10	7	3-6	3-5	4
2012	9-15	12-17	19	4-8	5-8	10	1-3	2-3	2
2013	13-20	13-19	14	7-11	6-9	2	3-6	3-5	0
2014	8-13	7-12	8	3-6	3-6	6	1-2	0-2	2
2015	6-11	6-10	11	3-6	1-4	4	0-2	0-1	2
2016	10-16	12-17	15	4-8	5-8	7	1-4	2-4	4
2017	11-17	14-19	17	5-9	5-9	10	2-4	2-5	6
2018	10-16	9-13	15	5-9	4-7	8	1-4	0-2	2
2019	9-15	10-17	18	4-8	5-9	3	2-4	2-4	3
2020	13-19	19-25	30	6-10	7-11	13	3-6	3-6	6
2021	13-20			6-10			3-6		

NS: Named Storms

HU: Hurricanes (Category 1+)

MHU: Major Hurricanes (Category 3+)

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