2010 Hurricane season: Unusually quiet in the Northern Hemisphere

As we look around the Northern Hemisphere, there have been only 16 named tropical cyclones overall as we move into late August. This includes five in the East Pacific, four in the West Pacific, and three each in the Indian and Atlantic Ocean basins. As last year's El Nino has waned and La Niña set in, many projected a very active hurricane season in the Atlantic Ocean Basin for 2010 [1],[2],[3].

Of course, it is still early yet, and we could see the number of storms pick up rapidly during the rest of August and September. Some have predicted we could see a "frenzy of storms" starting next week [3]. Research has shown La Niña years tend to get a late start [4], [5] and then are quite active in late August and more active than usual in September and October. Of course all this is valid for the Atlantic Ocean Basin. Does this hold for the rest of the Northern Hemisphere?

Past research [6] and research that will appear later this fall [7] would suggest this is not the case. Generally, in the Pacific Basin, there is only weak ENSO variability in the number of named storms, and if anything the number of tropical cyclones during La Niña years is generally a bit fewer. However, for a typical year by the end of August we would expect 29 tropical cyclones for the Northern Hemisphere give or take roughly 10. Thus, the occurrence of only 16 tropical cyclones by this time of the year could be considered unusually quiet.

In the Atlantic and Northern Indian Ocean, the fact that only three named storms have occurred in each basin by this time is not unusual. In fact, in these basins occurrences of tropical cyclones are close to the norm by the end of August (four in the Atlantic and two in the Indian Ocean). Thus, the early forecasts of high activity could still verify.

The primary reason for the quiet season in the Northern Hemisphere has been the relatively inactive East and West Pacific Ocean Basins. Only nine named storms have occurred in these basins this year. The activity in each of these basins correlates positively with each other and negatively to the Atlantic Ocean basin [7]. The study of Lupo et al [5], shows that there were fewer tropical cyclones in the East Pacific during La Niña years.

In the East Pacific, the years 1977, 1996 and 1999 were similarly quiet. In the West Pacific, the years 1973, 1983, and 1998 were similar into mid-August, and 1977 into late August. All of these years were either La Niña or ENSO neutral (however, 1983 and 1996 were leaning toward La Niña, cold SSTs, by the hurricane season).

Over the whole Northern Hemisphere, this has been the quietest start to the hurricane season since 1977 and 1983 when only 14 named storms had occurred by this time in the year. In

1983, however, the latter part of August became more active. Of the 16 named storms this year, only five have been of hurricane strength and 11 have been tropical storms. The lower activity and weaker storms in general are consistent with the sharp reduction recently in global accumulated cyclone energy [8], a measure of tropical cyclone potential.

All of this, however, does not square with the expectations by the IPCC and many others that global warming was going to result in more and stronger storms. This was one of the many bad side effects we as humans were going to visit upon ourselves through the use of fossil fuels. It appears that those who showed that tropical cyclone variations are more tied to natural climate variations which can impact both the oceanic and atmospheric factors which are mutually important in their formation [9].

[1] http://www.nhc.noaa.gov

[2] http://hurricane.atmos.colostate.edu/Forecasts/

[3] http://www.accuweather.com

[4] Lupo, A.R., and G. Johnston, 2000: The Interannual Variability of Atlantic Ocean Basin Hurricane Occurrence and Intensity. *Nat. Wea. Dig.*, **24:1,** 1-11.

[5] Lupo, A.R., T.K. Latham, T. Magill, J.V. Clark, C.J. Melick, and P.S. Market, 2008: The Interannual Variability of Hurricane Activity in the Atlantic and East Pacific Regions. *Nat. Wea. Dig.*, **32:2** 119-135.

[6] Lander, M. A., 1994: An exploratory analysis of the relationship between tropical storm formation in the western North Pacific and ENSO, *Mon. Wea. Rev.*, **122,** 636– 651.

[7] Lupo, A.R., 2010: *Interannual and Interdecadal variability in hurricane activity*. *Hurricane Research*, ISBN 978-953-7619-X-X, Intech Publishers, Vienna (In preparation)

[8] *http://www.coaps.fsu.edu/~maue/tropical/ From Ryan N. Maue's 2010 Global Tropical Cyclone Activity Update*

[9] Zuki, Md. Z., and A.R. Lupo, 2008: The interannual variability of tropical cyclone activity in the southern South China Sea. *J. Geophys. Res.*, **113,** D06106, doi:10.1029/2007JD009218 – 14 pp