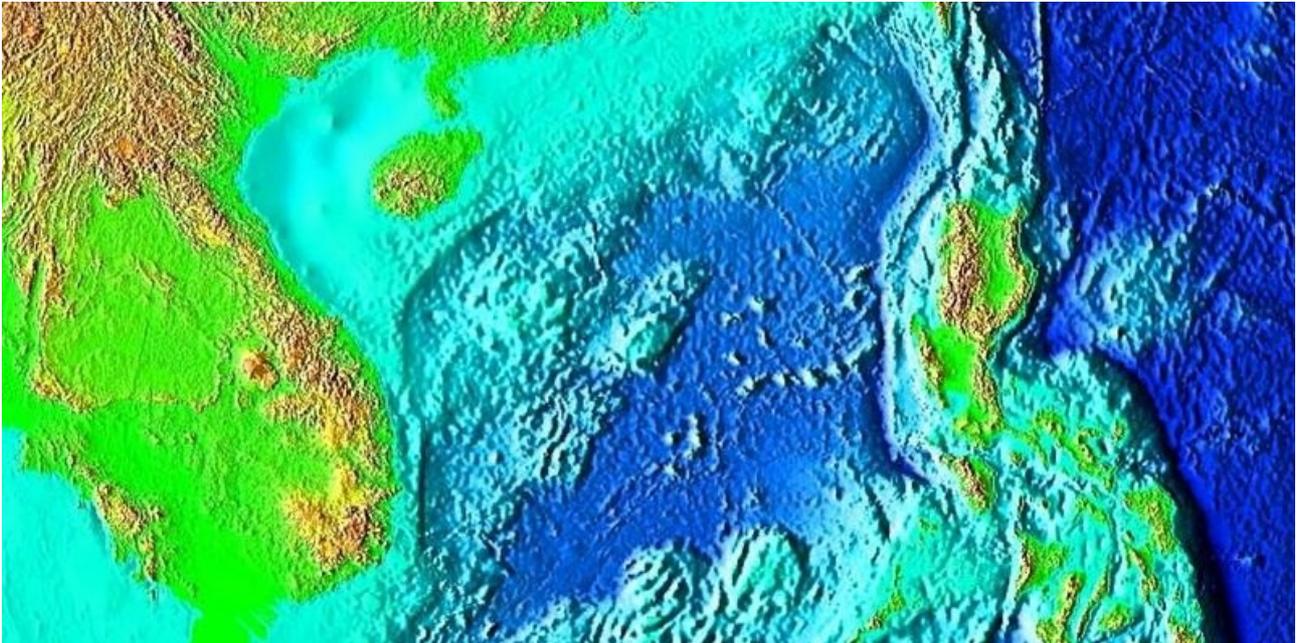


The South China Sea



by Robert Chang

The weather in the South China Sea region is characterized by two monsoons: the Northeast and Southwest monsoons, so called because the predominant wind direction is *from* the northeast and the southwest respectively.

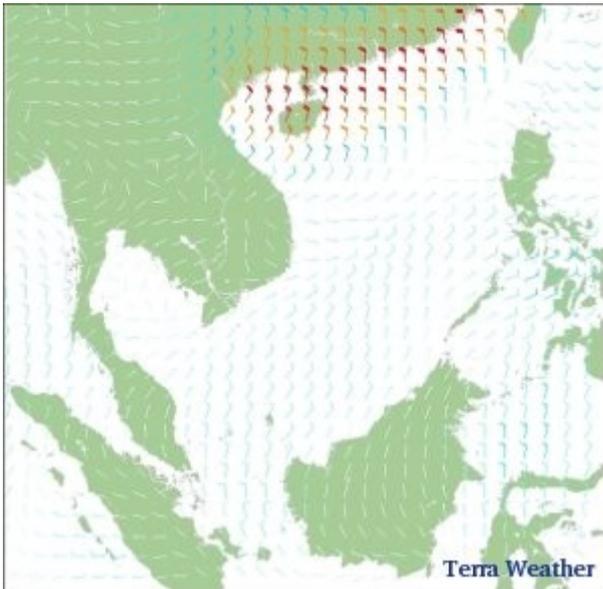
The Northeast monsoon (Nov - Mar) occurs during the northern hemisphere winter, when the sun is nearer the Equator, while the Southwest monsoon (May - Sept) takes place during the northern hemisphere summer. Sandwiched between these monsoons are the Spring (Apr) and Autumn (Oct) *inter-monsoonal* or *transitional* periods characterized by squally weather and overcast skies.

Tropical Cyclones occur almost all year round over the northern South China Sea, especially during the latter half of the year. They are mainly confined to above latitude 10°N. However, rare storms can occur even as far south as the Sulu Sea. Very rarely, Tropical Cyclones may develop very close to the equator (like Typhoon Vamei in 2001).

The Monsoons of the South China Sea

The salient factors controlling the weather over the southern South China Sea region are the two monsoon seasons, namely the Northeast and Southwest monsoons. The monsoons develop due to the differential heating of the Asiatic landmass and the adjacent oceanic areas. This results in the annual cyclic movement of a zone of convergence between the northeast trade winds from the northern hemisphere and the southeast trade winds from the southern hemisphere.

At the height of the northern hemispheric summer, this zone of convergence or monsoon trough lies over mainland China extending southeast to the western Pacific. As the season progresses, the monsoon trough migrates southwards and by winter has reached its southern limit, extending east-west across the Indian ocean and northern Australia.



The Northeast Monsoon

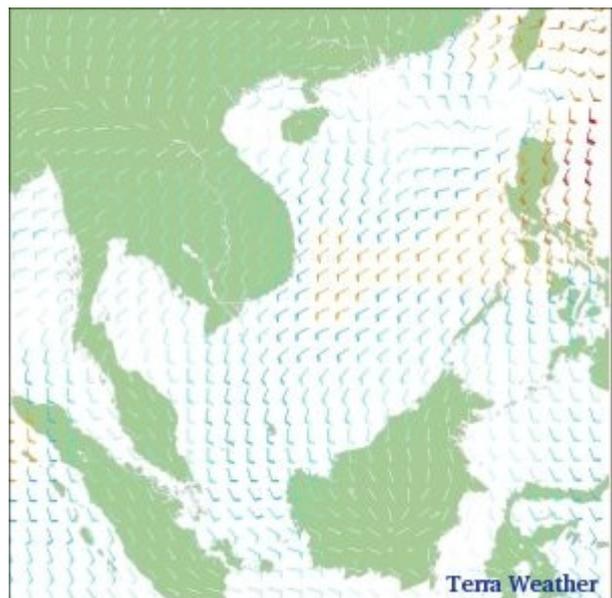
At the end of the northern hemispheric summer, the Asiatic landmass begins to cool as the sun migrates south. This causes surface atmospheric temperatures to fall and with colder, denser air, barometric pressure begins to rise. The result is the

formation of anticyclones (high pressure cells) over the Siberian region which intensify as winter progresses. Airflow around an anticyclone carries air from the Asiatic interior across China and out over the South China Sea as the Northeast monsoon.

Typically the Northeast monsoon sets in over the southern South China Sea in early November lasting to early March.

New anticyclones form every 3 to 10 days, so the winds in the Northeast monsoon increase sharply then wane with this cycle. These sudden increases in wind speed are known as *surges* in the Northeast monsoon. Surges are usually stronger and last longer during the early part of the Northeast monsoon, but get progressively weaker and shorter during the latter half of the monsoon.

Surges are especially marked in the northern South China Sea, where winds can go from 5 knots to over 40 knots in a matter of hours. The top left figure shows a typical surge in the Northeast monsoon. Note the gale force winds over the southern Chinese seaboard (red wind barbs) and light winds just a few degrees farther south.



The Southwest Monsoon

The Southwest monsoon dominates from May to September. It develops from a reversal of the conditions in winter. The interior of the Asiatic landmass begins to warm during spring resulting in decreasing surface atmospheric pressure.

As summer progresses a low pressure area develops and reverses the atmospheric circulation over the Asiatic landmass. Airflow is now *towards* the Asiatic landmass. The Southeast trade winds over the southern Indian Ocean cross the equator and turn towards the northeast to blow over the South China Sea as the Southwest monsoon.

The figure on the right shows the wind pattern over the South China Sea, typical during the Southwest monsoon. Note the Tropical Cyclone over the Luzon Straits.

Sustained increases in wind speed, known as "surges" in the Southwest monsoonal flow can occur when Tropical Cyclones pass to the east of the Philippine archipelago.

The Transitional Periods

The two transitional periods in between the Northeast and Southwest monsoons are known as "inter-monsoonal" or "transitional" periods. These periods are characterised by light winds, overcast skies and squally weather over the South China Sea.

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