Chapter 5

CONCLUSION

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We now possess the relevant information needed for "do it yourself" forecasting of the two most intriguing elements that influence ocean addicts around the globe, wind and swell. We can now use the humble weather chart to our distinct advantage by applying the fetch analysis diagram, and by tuning in to the sequence of weather events, and their influences, we are able to identify the windows that present themselves throughout the seasons.

Now that we have discussed both the technical details that are revealed to the trained eye on weather charts and satellite images, and the influences ocean current movements and upper atmospheric activity have on the global circulation, we can consider the intricacies involved in long term forecasting.

5.1 LONG TERM FORECASTING

The procedure for long term forecasting is determined by how far into the future you need to go. Forecasts longer than a month require an understanding of the normal seasonal cycles described in the Almanac, and the possible deviations that may occur to the global circulation when upper activity is involved and/or when ocean current influences are behaving abnormally.

Weekly forecasts begin with an awareness of the future hemispheric position of the upper atmsospheric trough in relation to the anti cyclone and its dominant meridianal flow, as this is where cyclones are likely to develop or intensify.

Advances in meteorological technology have allowed the experts to almost master weekly forecasting as they are regularly accurate in indicating the future location of a wind and swell event within about 7 days. However, accuracy remains elusive as the various long range forecasts rarely represent the final status of the cells more than 1 day out, so swell size and direction will often be incorrect.

As previously discussed, status determines wind and swell intensity and direction and ultimately decides the conditions of the day. Therefore, it is still necessary to clarify the cell's status using the short term procedure described in chapter 1 summary, because it is unrealistic to make a final decision for a week out based on an assumed status that may change considerably during the forecast period.

The involvement of upper activity is one reason for wayward long range forecasts, another is unfavourable surface interactions and although they are taken into account when short term forecasts are being prepared it becomes increasingly difficult to factor in these anomalies over 3 or 4 days or more.

These factors have a profound influence on cell status, but they will not adhere to the persistence theory, therefore long range forecasts like wave models or buoy forecasts can only represent a fictitious account of future events. Nevertheless, they have their uses in indicating the possible position and timing of potential swell events up to about 7 days out.

If we combine this information with our knowledge of ocean current influences and upper activity we can determine if the status of future events may occur as forecast as an event approaches. This is achieved by considering how they can influence or displace cyclonic activity.

For example, If upper activity is weak and normal sea surface temperatures (SST) appear to be in their normal seasonal position as described in chapter 3 section 16, then expect the seasonal activity described in the Almanac to prevail and the 4 day Prognosis to be fairly accurate.

However, warmer than anticipated currents may bring on stronger cyclonic activity in advance of its forecasted arrival. Colder than anticipated currents may defuse cyclonic activity or it may even alter its development from an easterly to a westerly main fetch with cold frontal activity when in middle latitudes.

This illustrates how small changes can easily disrupt the outcome of a long range forecast. Global infrared images provide the trained eye with a good indication of the position and temperature of surface currents with the darkest colors revealing temperatures of 22˚C (74˚F) or more. Sea surface temperature charts will also be of value if available for the regions of interest as they indicate temperatures above 24˚C (76˚F). While the Climate Prediction Centre (CPC) website also reveals the depth of the warm tropical currents.

Deep warm currents or Eddies in the tropics of 26˚C (80˚F) or more are a recipe for status intensification when surface activity like troughs or cyclones move overhead in the warmer months. If

upper activity like the easterly jet stream moves overhead the potential for extreme cell development is enhanced. As these currents find their way poleward into middle latitudes the potential for hybrid activity is increased over surface temperatures of 24˚C (76˚ F) or more, while interactions with cold frontal activity can form hybrid bombs. The potential for extreme cell development is also enhanced if westerly upper activity like troughs, cyclones or jet streams move overhead as the seasons progress.

As you can see by these examples a good understanding of ocean currents, upper activity and their influences on surface pressure cells will provide ocean storm chasers with the vital clues to position themselves within range of the fetch rather than within it.

Warm or Cold events also displace cyclonic activity from its normal pattern because favourable (Sea Surface Temperature) often occurs out of sync with surface pressure cells when prevalent. These events result in unseasonable cell developments or failures so forecasting procedures will have to be adjusted accordingly.

Strong Warm events mean a Cold event exists elsewhere, but not necessarily in the same Gyres circulation. New cycles may eventuate that are determined by the position of each event and are recognised by the position of warm (Sea Surface Temperature).

Repetition of events allow us to identify different cycles in wind and swell behaviour. El Niño has proven to deteriorate cyclone activity in the western Pacific but at the same time it is often enhanced in the eastern Pacific which can effect cyclonic activity in areas other than the tropics. This is most obvious during a strong event when Hawaii and the west coast of America may receive a giant swell season while the Australian east coast may miss out on any tropical cyclone activity altogether.

The rough 10 year cycle of strong events mentioned in chapter 3.5 shows the last brief (La Niña) event occurred around 1999 which makes the east Australian surf season look pretty ordinary during the first decade of the new millennium. This does not mean that troughs/cyclones will be completely absent during this period as short term oscillations will often bring mild events into play, however it does provide Aussie ocean addicts with a good excuse to plan that global adventure.

Climate data also shows a rough 50 year cycle in extreme ((La Niña) events in the south western Pacific which gives some credence to the 50 year storm theory. The most reliable records date back to the 1900's and show extreme warm event peaks between 1916-18 and 1973-75 which would put the next extreme event at around 2025.

However, as previously mentioned it is unwise to use past events to forecast future possibilities, particularly over such time frames. Apart from the associated anomalies, strong climate changing events can in themselves change the Gyres temperatures and the atmospheric cycles.

These include the extreme Warm events associated with the so called 50 year storm patterns, global warming, volcanic activity - particularly deep ocean vents, polar meltdowns and salinity variations within the Thermohalin, or global solar dimming from pollutants in the atmosphere.

Ultimately, it is up to each individual forecaster to be aware of these potential deviations with the use of reliable meteorological information which is generally freely available to us all. Most of the relevant information regarding weather charts and the above anomalies can be found on the official meteorological web site for the regions of interest. Of course, there are new product versions being introduced all the time like combined surface and upper prognosis loops, for example. Navy sites post good information for travellers because they are global scale and they often issue 6 day numerical forecast loops at a range of different levels. https://www.fnmoc.navy.mil/public/ is a good place to start.

GOOD LUCK.

OCEAN ADDICTS

5.2 HANDY FETCH ANALYSIS, 1 + 2 + 3.

1. DETERMINE GRADIENT RANGE, "on 4mb chart".

* Mild gradient 15-30kts (30-60km)
* Strong gradient 30-45kts (60-90km)
* Extreme gradient 45kts (90km) or more, see 3.

2. DETERMINE PRESSURE/SWELL RANGE.

Millibars	**gradient**	**metres**	**feet**
1020-1000	mild	1-2	3-6
	strong	2-3	6-9 +
1000-980	mild	3-4	9-12
	strong	4-5	12-15 +
980-960	mild	5-6	15-18
	strong	6-7	18-21 +
960-940	mild	7-8	21-24
	strong	8-9	24-27 +
940-920	mild	9-10	27-30
	strong	10-11	30-33 +
920-900	mild	11-12	33-36
	strong	12-13	36-39 +
900-880	mild	13-14	39-42
	strong	14-15	42-45 +
880-860	mild	15-16	45-48
	strong	16-17	48-51 +

3. INCLUDE SWELL INFLUENCES, IF NECESSARY.

* Add 1/3 to swell range for:
  > extreme gradient.
  > strong cold front.

* Add 1/2 to swell range for:
  > strong north hemisphere cold front.

* Double swell range for:
  > secondary fetch.
  > combination swells.

* Reduce 1/3 from swell range for:
  > fetch length travelled.
  > refraction by ninety degrees.
  > strong opposing convergence/wind.

* Swell velocity/ETA:
  > 2m (6ft) covers 45nm (90km) in 6 hours or around 500nm (1000km) in 60 hours.
  > 6m (18ft) covers 90nm (180km) in 6 hours or around 1000nm (2000km) in 60 hours.
  > 16m (48ft) covers 135nm (270km) in 6 hours or around 1500nm (3000km) in 60 hours.

* Allow for size and speed reduction over long distances.

Illusions. Photo, Ile.

Whether you're surfing, sailing, fishing, or pleasure craft cruising, the state of the ocean and atmosphere can make or break your recreational pursuits.

By learning to anticipate wind and swell in the short term and long term with this book, we can readily identify our windows of opportunity in advance.

Save precious time and money! Tune into the sequence of weather events, identify the fetch, and pick wind and swell conditions from a glance at a Weather Chart,

a must for any ocean addict.

Incorporating the
OCEAN ADDICT'S
ALMANAC