



PETRONAS

OTC Asia 2014: Panel Session 7:
Operating in Adverse Weather Conditions

Metocean

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Q: What is Adverse Weather?

A: Bad weather. Weather condition above the 'norm' for the area, which disrupt offshore operations.

Wave

Wind

Current

Ice

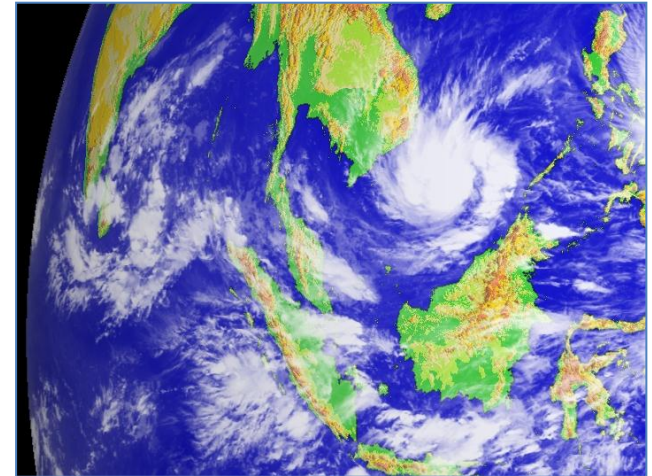
Others



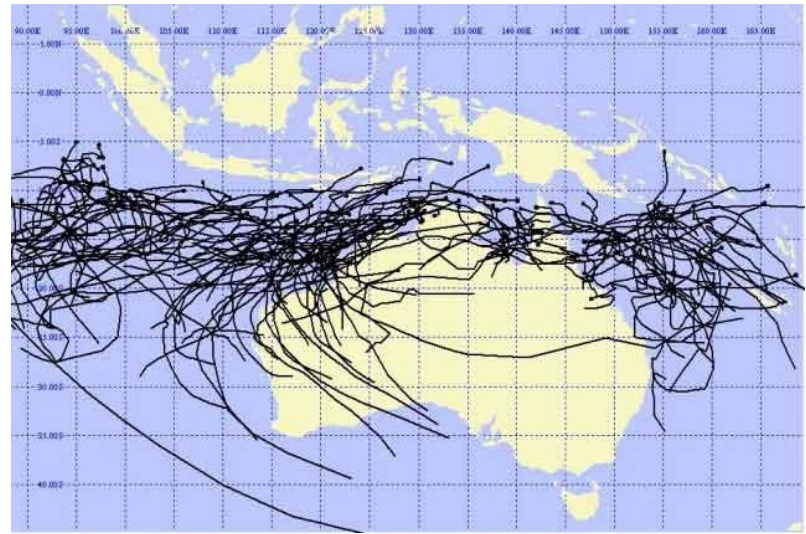
South China Sea

The main hazards:-

- Monsoon surges – higher winds and associated waves
 - Northeast Monsoon (November – March)
 - Southwest Monsoon (May to September)
- Tropical Cyclones (Typhoon)
 - High winds and waves
 - Particularly in the North of SCS
 - Rare in the South
 - All year, but more common in July – September
- Tidally-induced tidal waves and Solitons
 - Cause sub-surface current reversal events
 - In specific areas in SCS marginal seas, e.g. Sulu Sea
- Squalls



Australia



The North West Shelf region hazards:-

- Tropical cyclones
- Monsoon surges
- Squalls
- Thunderstorms
- Long period swell originating from Southern Ocean, North Atlantic and North Indian Ocean
- Large tidal range over the shelf, with associated tidal currents
- Baroclinic tides over the continental shelf and shelf break, internal waves with associated currents
- Soliton - high frequency internal waves

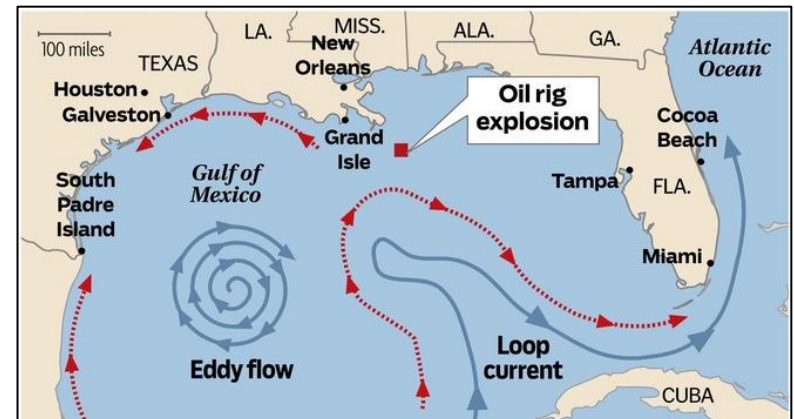
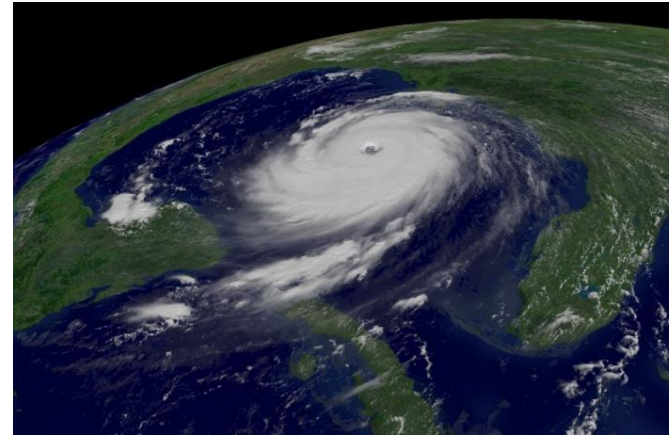
Other regions:-

- Tropical storms also affect Arafura Sea and Timor Sea, Offshore Queensland & Western Australia
- Southern Ocean storms and swells affect SW Australia, Great Australian Bight & Tasman Sea
- Thunderstorms affect Queensland

Gulf of Mexico

Main hazards:-

- **Hurricanes**
 - generate extreme wind and wave conditions
 - Wind speed >100knots
 - Wave heights > 12m Hs
- **Northers – strong northerly winds**
 - October – February,
 - Produce sea-states up to 8m Hs
- **Loop current and loop current eddies**
 - Surface current up to 3-4knots
 - Extend from surface to ~ 500m depth
- **Deep currents**
 - Intense jets to 600m depth – up to 5knots
 - TRW currents ~ 2000m depth – up to 2knots



North Sea

Main hazards:-

- Extra-tropical depressions and storms, leading to
 - High wind speeds
 - Short, steep seas



- Storm surges
- Strong surge-related currents
- Large tidal range on East coast of UK
- Icing, snow and sea spray icing

Some Regional Comparisons

Extreme Values – 10 year return period

	South China Sea	Australia (NWS)	Gulf of Mexico	North Sea (Northern)
Wind speed (m/s)	25	25	28	40
Wave - Hs(m)	5.1	7.4	8.5	14.3
Period Tpeak (s)	11	12	12	16
Current surface (m/s)	1.4	-	1.3	0.7
Special consideration	Monsoon, Typhoon	Typhoon, squall, swell	Hurricanes, loop current	High winds, waves, Icing

What support can Metocean provide for Operations?

- Metocean operating criteria
- Weather Forecast
- Swell Forecast
- Current Forecast
- Real time wind, wave, current

----final slide-----

Spare slides

STOP!

Thanks

Other Hazards to Offshore Operations

Metoccean conditions not met in these areas include:-

- Lightning
- Dust storms
- Fog
- High and low temperatures
- Icebergs and Sea Ice