

TSR's Regional Advisory Datasets

Tropical Storm Risk (TSR) is a leading provider of tropical storm forecasting, delivering accurate predictions for hurricanes, typhoons, and cyclones. Since 1998, TSR has provided seasonal forecasts, and since 2004, its email alert service has offered probability-based forecasts of the likelihood of being impacted by tropical storm or hurricane-force winds from a tropical cyclone.

Building on these services, TSR developed an event-based spatial data suite, including probabilistic and deterministic five-day forecasts, rainfall accumulations, 100-member ensembles, and post-event swaths. These products support risk management across multiple industries, including leisure, tourism, marine, aviation, finance, healthcare, insurance, humanitarian aid, and government agencies. Today, over 21,000 users worldwide rely on TSR's alerts and data products.

Until 2025, TSR's forecasts were based solely on advisories from the National Hurricane Center (NHC) and Joint Typhoon Warning Center (JTWC), updated every 3–6 hours in the Northern Hemisphere and 6–12 hours in the Southern Hemisphere. To improve update frequency and provide products based on official regional meteorological agencies in addition to JTWC, TSR has now integrated regional agency advisories into its product suite.

While NHC and JTWC datasets are still produced in the Saffir-Simpson scale, TSR's additional regional data products adopt their respective regional wind scales, ensuring better alignment with local terminology and insurance policies. Previously only covered by the JTWC, TSR now incorporates advisories from:

- La Réunion (South Indian Ocean)
- Bureau of Meteorology (part of the South Indian Ocean and Southwest Pacific)
- Indian Meteorology Department (North Indian Ocean)
- Japan Meteorological Agency (Northwest Pacific)

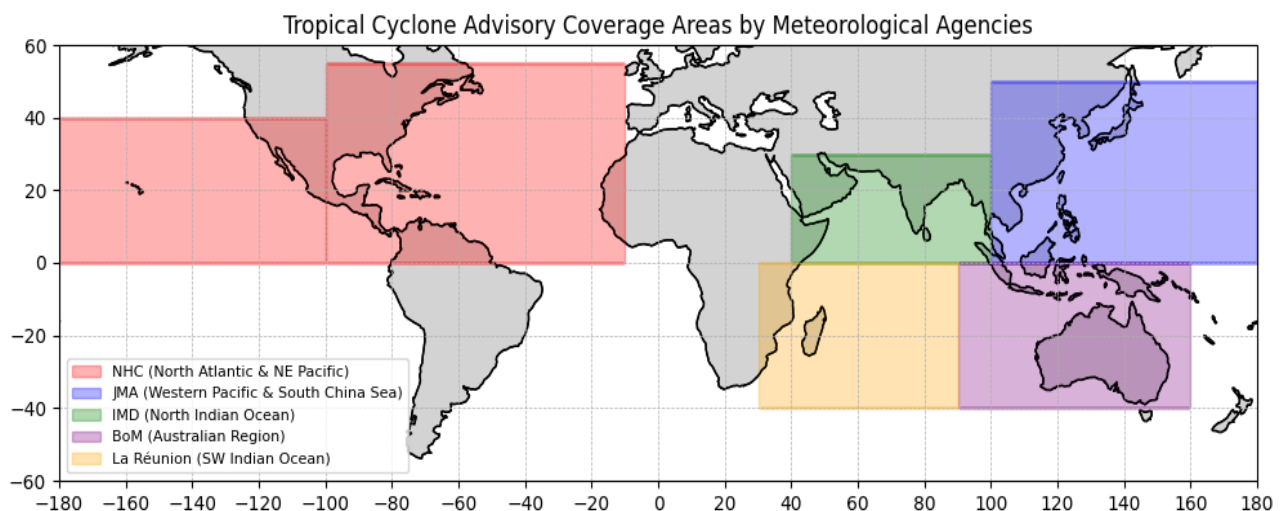


Figure 1: Global map showing regional advisory extents.

TSR now offers the following products based on regional advisories:

- Forecast Wind and Gust Footprints
- Forecast Rainfall Accumulations to 12, 24, 36, 48, 72, 96, 120 hours
- Post-Event Footprints for Wind and Gust

Key features:

- TSR generates wind and gust fields for tropical storms when wind speeds exceed 34 mph
- Updated every 3-6 hours
- Spatial resolution of 0.05 degrees (~5km).
- Available in a choice of four map formats (KML, SHP, NetCDF, ASCII) for display on different Earth-mapping platforms and risk mapping software, HTML for browser-based analysis, with additional formats available upon request.
- Able to overlay shapefiles with other data e.g. population for greater depth of understanding.
- Data can be automatically downloaded via API integration

National Hurricane Center | North Atlantic & North-East Pacific Basin

The National Hurricane Center (NHC) issues tropical cyclone advisories for the North Atlantic Ocean and the Northeast Pacific Ocean from 180°W to the Mexican coastline.

This coverage includes the United States, Mexico, Canada, Central America, the Caribbean, Bermuda, the Bahamas, and Hawaii.

Wind intensity is measured using 1-minute sustained wind speeds. The blue band represents the wind speed required for spatial data formation:

Saffir-Simpson Wind Scale Category	Wind Speed (km / h)	kts
5	≥ 252	≥ 137
4	209 - 251	113 - 36
3	178 - 208	96 - 112
2	154 - 177	83 - 95
1	119 - 153	64 - 82
Tropical Storm	63 - 118	34 - 63
Tropical Depression	≤ 62	≤ 33

Updates will occur every six hours; however, if a storm is approaching land, intermediate public advisories are used, allowing updates at least every three hours.

La Réunion | South Indian Basin

The Météo-France La Réunion issues tropical cyclone advisories for the Southwest Indian Ocean, covering areas from the African coastline to 90° East longitude. This coverage includes Madagascar, Mozambique, Tanzania, Kenya, Comoros, Seychelles, Mauritius, Réunion, and Mayotte.

Wind intensity is measured using 10-minute sustained wind speeds. The blue band represents the wind speed required for spatial data formation:

La Reunion Wind Scale Category	Wind Speed (km / h)	kts
Very Intense Tropical Cyclone	>212	115
Intense Tropical Cyclone	166 - 212	90 - 115
Tropical Cyclone	118 - 165	64 - 89
Severe Tropical Storm	89 - 117	48 - 63
Moderate Tropical Storm	63 - 88	34 - 47
Tropical Depression	51 - 62	28 - 33
Tropical Disturbance	<50	<28

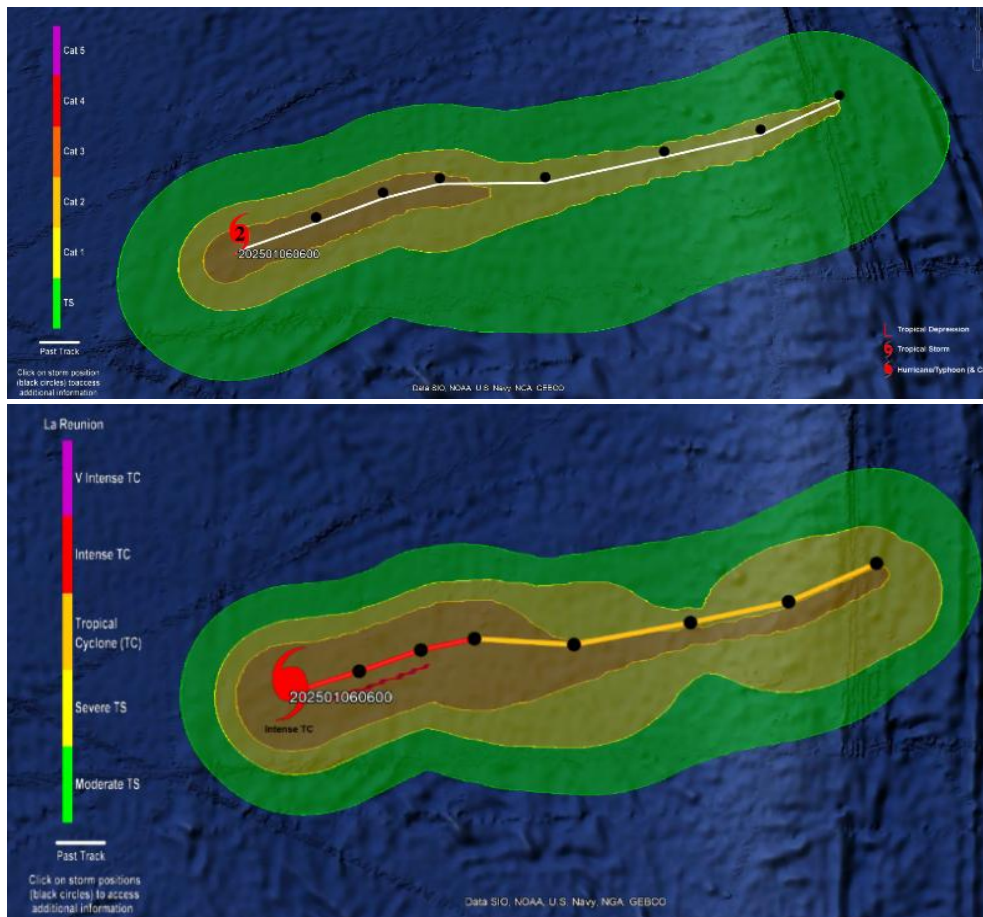


Figure 2: Two post-event footprints for Cyclone Vince on 6th February 2025 at 06:00. The above footprint is based on JTWC data, using the Saffir-Simpson scale, while the one below is derived from La Réunion's advisory, in their regional wind scale.

Due to the differences in wind speed averaging periods between JTWC and the regional agencies, differences in the assessment of storm intensity between agencies and the difference between the Saffir-Simpson hurricane wind scale and regional wind scales, wind and gust footprints for a given storm using data from different agencies will normally look different, as can be seen for the cyclone Vince historical wind swathes constructed from JTWC and La Reunion advisories above.

Wind speeds in tropical storms are often stronger on one side of the storm track—either to the right or left—depending on the storm's translational motion. Stronger winds in the Southern Hemisphere tend to occur to the left of the storm track, while in the Northern Hemisphere, they are typically to the right. Regional advisories and advanced computational methods capture these differences more effectively, improving storm impact assessments, risk modelling, and insurance calculations. Factoring in wind asymmetry helps insurers and risk managers better estimate storm surges and potential damage.

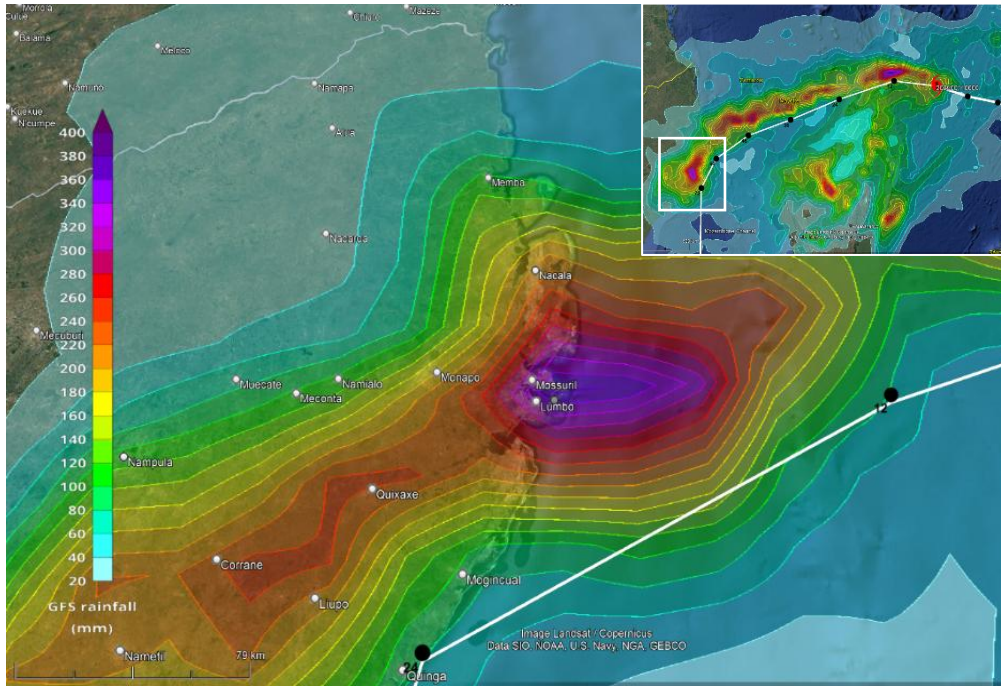


Figure 3. La Réunion advisories for Cyclone Dikeledi overlaid with GFS rainfall data.

The top-right map shows Cyclone Dikeledi’s past and forecasted storm track, with rainfall projections extending up to 120 hours. The small white box highlights the 96-hour forecast for 00:00 on January 11, 2025, indicating concentrated rainfall approaching Mozambique’s coastline. The larger map, based on an advisory from 18:00 on January 12, 2025, forecasts extreme rainfall of 400mm over a 96-hour period over Mossuril, an accurate reflection of the observed event.

Japan Meteorology Advisory | Northwest Pacific Basin

The Japan Meteorological Agency (JMA) issues tropical cyclone advisories for the Western North Pacific Ocean and the South China Sea, covering areas west of 180° longitude and extending to the Asian coastlines.

This coverage includes Japan, Taiwan, China, the Philippines, North Korea, South Korea, Vietnam, Laos, Cambodia, Palau, Myanmar, Thailand, Brunei, Malaysia, the Northern Mariana Islands, Guam, and the Federated States of Micronesia.

Wind intensity is measured using 10-minute sustained wind speeds. The blue band represents the wind speed required for spatial data formation:

JMA’s Tokyo Wind Scale Category	Wind Speed (km / h)	kt
Violent Typhoon	≥194	≥105
Very Strong Typhoon	157 - 193	80 - 104
Typhoon	118 - 156	64 - 84
Severe Tropical Storm	89 - 117	48 - 63
Tropical Storm	62 - 88	34 - 47
Tropical Depression	≤ 61	≤ 33

Indian Meteorological Department | North Indian Basin

The Indian Meteorological Department (IMD) issues tropical cyclone advisories for the North Indian Ocean, covering the Bay of Bengal, Arabian Sea, and Andaman Sea. IMD coverage includes India, Sri Lanka, Bangladesh, Myanmar, Thailand, Pakistan, Oman, Yemen, and Somalia.

Wind intensity is measured using 3-minute sustained wind speeds. The blue band represents the wind speed required for spatial data formation:

Indian Met. Department Wind Scale Category	Wind Speed (km / h)	kts
Super Cyclonic Storm	≥221	≥120
Extremely Severe Cyclonic Storm	166 - 220	90 - 119
Very Severe Cyclonic Storm	118 - 165	64 - 89
Severe Cyclonic Storm	89 - 117	48 - 63
Cyclonic Storm	63 - 88	34 - 47
Deep Depression	51 - 62	28 - 33
Depression	31 - 50	17 - 27

Bureau of Meteorology | Australia, Southwest Pacific, South Indian Basins

The Australian Bureau of Meteorology (BoM) issues tropical cyclone advisories for Australia, *partially* the Southwest Pacific, *and* South Indian basin. 5°S to 40°S, 90 E – 160E is covered, which includes Papua New Guinea, Indonesia, the Solomon Islands, Timor-Leste, New Caledonia, and parts of the South Pacific Ocean.

Wind intensity is measured using 10-minute sustained wind speeds. The blue band represents the wind speed required for spatial data formation:

Australian BOM Wind Scale Category	Wind Speed (km / h)	kts
5	> 198	> 107
4	159 - 198	86 - 107
3	119 - 157	64 - 85
2	89 - 117	48 - 63
1	63 - 88	34 - 47

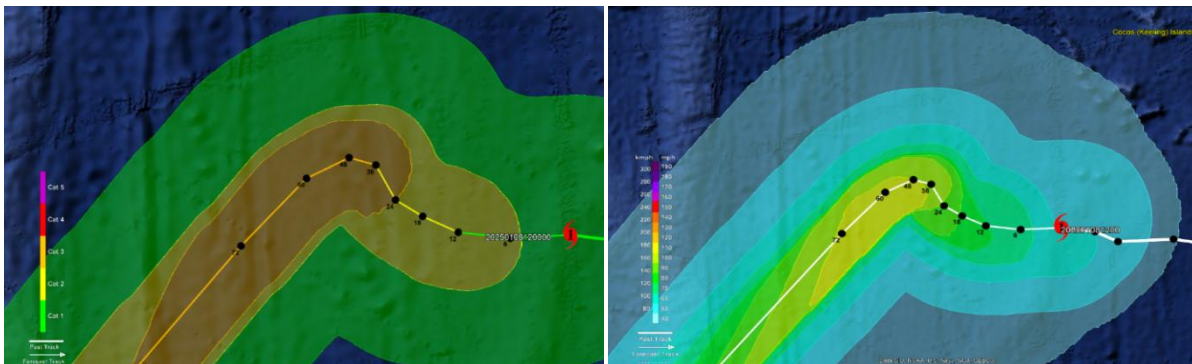


Figure 4: An example of a forecast wind swath (above) and gust swath (below) out to 5 days, produced by BoM's advisory for Cyclone Tahlia on 8th February 2025 at 12:00. This is an intermediate advisory, updating every 6 hours, whereas the JTWC advisories only update every 12 hours.