

Cyclone Hazard Proneness of Districts of India

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Regional Specialised Meteorological Centre (RSMC), New Delhi, has prepared cyclone hazard proneness of districts of India based on frequency of total cyclones, total severe cyclones, actual/estimated maximum wind strength, Probable Maximum Storm Surge (PMSS) associated with the cyclones and Probable Maximum Precipitation (PMP) for all districts as presented in Fig. 1.

For details about the data, methodology and results the following publication may kindly be referred:

Cyclone hazard prone districts of India, M. Mohapatra, 2015, Journal of Earth System Science, 124, No.3, pp. 515-526).

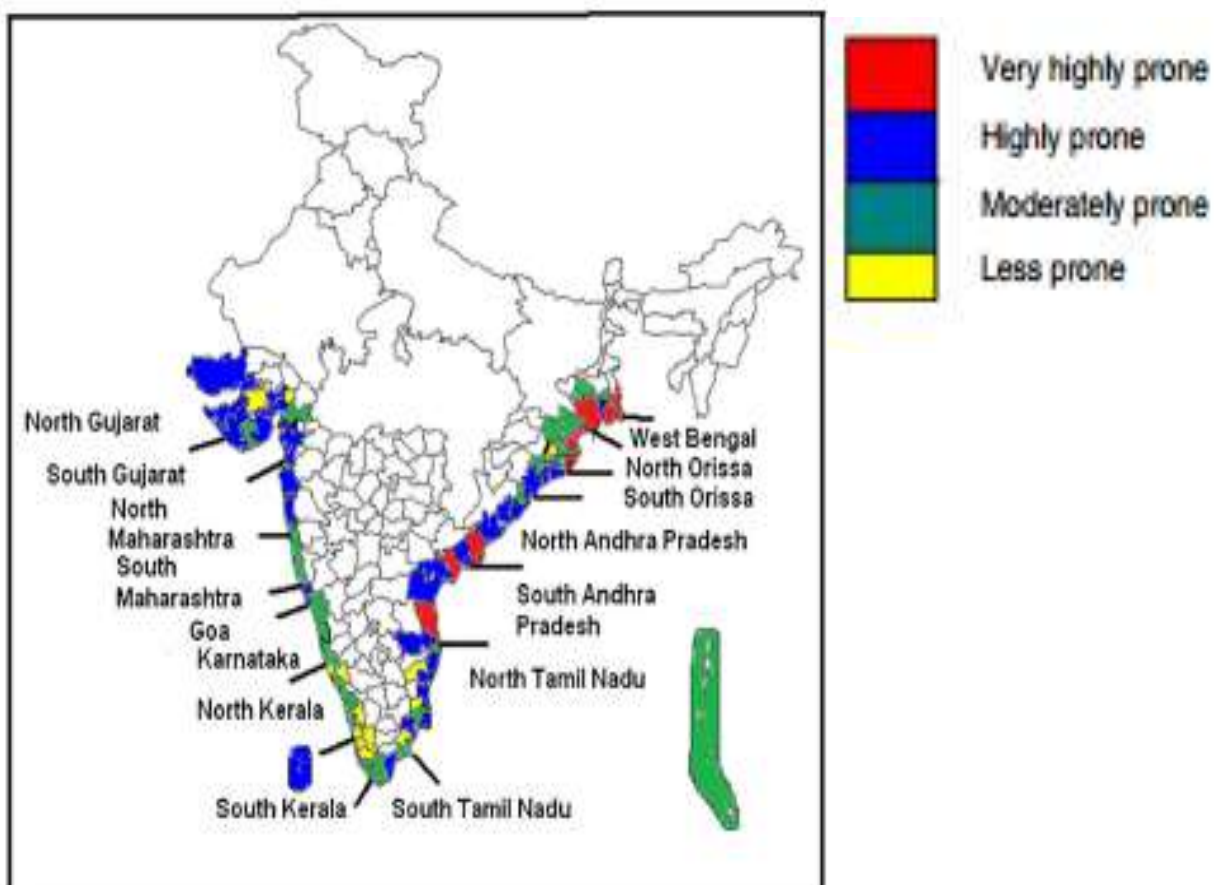


Fig.1: Cyclone hazard prone districts of India based on frequency of total cyclones, total severe cyclones, actual/estimated maximum wind strength, PMSS associated with the cyclones and PMP for all districts

Table 1: Cyclone hazard prone districts of India touching coast based on frequency of total cyclones, severe cyclones; strength of actual/estimated wind, PMSS and PMP

State	Districts	Degree of Proneness	Degree of Proneness	Meaning
Andhra Pradesh (AP)	Nellore	P1	P1	Very Highly Prone
	East Godavari	P1		
	Krishna	P1		
Odisha	Balasore	P1		
Odisha	Kendrapara	P1	P2	Highly Prone
	Jagatsinghpur	P1		
	Bhadrak	P1		
	Puducherry	Yanam		
West Bengal	South 24-Pragana	P1	P3	Moderately Prone
	Medinipur	P1		
AP	Srikakulam	P2	P4	Less Prone
	Guntur	P2		
	Visakhapatnam	P2		
	West Godavari	P2		
	Prakasam	P2		
	Vizianagaram	P2		
Daman & Diu	Diu	P2	P2	
Gujarat	Junagadh	P2		
	Kachchh	P2		
Lakshadweep	Lakshadweep	P2	P2	
Odisha	Ganjam	P2		
	Puri	P2		
	Khordha	P2		
Puducherry	Karaikal	P2	P2	
Tamil Nadu	Pudukkottai	P2		
	Cuddalore	P2		
	Kanchipuram	P2		
	Tiruvarur	P2		
	Nagappattinam	P2		
	Chennai	P2		
	Ramanathapuram	P2		
	Toothukudi	P2		
Tirunelveli	P2			
Andaman & Nicobar Islands (A&N Islands)	A & N Islands	P3	P3	
Daman & Diu	Daman	P3		
Goa	North Goa	P3	P3	
	South Goa	P3		
Gujarat	Ahmedabad	P3	P3	
	Bhavnagar	P3		
	Amreli	P3		
	Jamnagar	P3		

	Anand	P3
	Navsari	P3
	Surat	P3
	Valsad	P3
	Bharuch	P3
	Porbandar	P3
	Rajkot	P3
	Vadodara	P3
Karnataka	Udupi	P3
	Uttar Kannada	P3
	Dakshin Kannada	P3
Kerala	Kozhikode	P3
	Malappuram	P3
	Thrissur	P3
	Kannur	P3
	Kollam	P3
	Alappuzha	P3
	Thiruvananthapuram	P3
Maharastra	Thane	P3
	Mumbai suburban	P3
	Ratnagiri	P3
	Raigarh	P3
	Sindhudurg	P3
Puducherry	Puducherry	P3
	Mahe	P3
Tamil Nadu	Viluppuram	P3
	Thanjavur	P3
	Tiruvallur	P3
	Kanyakumari	P3
Kerala	Kasargod	P4
	Ernakulam	P4
Total districts		72

Table 2: Cyclone hazard prone districts of India not touching the coast based on frequency of total cyclones, severe cyclones; strength of actual/estimated wind, PMSS and PMP

State	Districts	Degree of Proneness
West Bengal	North 24 Pragana	P1
	Kolkata	P1
AP	Chittor	P2
West Bengal	Howrah	P2
Dadra & Nagar Haveli	Dadra & Nagar Haveli	P3
Odisha	Mayurbhanj	P3
	Cuttack	P3
	Nayagarh	P3
	Gajapati	P3
	Jajpur	P3
	Keonjhar	P3
West Bengal	Hoogly	P3
	Bardhaman	P3
Gujarat	Surendra Nagar	P4
	Kheda	P4
Kerala	Wayand	P4
	Palakkad	P4
	Kottayam	P4
	Idukki	P4
	Pathanamthita	P4
Odisha	Dhenkanal	P4
Tamil Nadu	Ariyalur	P4
	Tiruvannamalai	P4
	Sivaganga	P4
Total Districts		24

The hazard maps prepared by committee constituted by NDMA in 2012 indicating total number of severe cyclones (maximum sustained wind speed (MSW) of 48 knots or more), total number of cyclones (MSW of 34 knots or more), actual/estimated MSW, probable maximum storm surge, daily probable maximum precipitation over coast are presented in Fig.2 (a-e). The cyclone parameters for various districts are presented in Table 3-5.

For details about the data, methodology and results the following publication may kindly be referred:

Classification of Cyclone Hazard Prone Districts of India, M. Mohapatra, G.S. Mandal, B.K. Bandyopadhyay, Ajit Tyagi, U.C. Mohanty, 2012, Nat Hazards,63:1601–1620

Table 3: Cyclone parameters for districts along east coast and Andaman and Nicobar (A and N) Islands

State	Districts	No. of severe Cyclones	Total No. of Cyclones	Wind Speed in knots	PMSS in metres	PMP in cm
West Bengal	South 24-Parganas	16	29	115	12	52
	Medinipur	10	22	115	13	56
Orissa	Balasore	5	28	75	11	60
	Kendrapara	6	17	140	8.5	60
	Bhadrak	4	17	65	9.5	60
	Jagatsinghpur	4	17	140	6.5	60
	Ganjam	5	11	100	4	48
	Puri	1	6	140	4	60
	Khordha	0	4	100	4	52
Andhra Pradesh	Nellore	8	18	110	4.5	60
	East Godavari	4	17	125	4.5	52
	Srikakulam	5	12	100	4	56
	Guntur	0	0	127	7.5	56
	Visakhapatnam	4	8	125	4	52
	Krishna	5	12	127	5.5	56
	West Godavari	3	6	127	5	52
	Prakasam	3	5	115	6	52
	Vizianagaram	1	3	94	4	52
Tamil Nadu	Pudukkottai	1	1	55	7	52
	Kanchipuram	8	13	55	3.5	68
	Cuddalore	4	6	90	3.5	68
	Tiruvarur	3	6	90	5.5	60
	Nagappattinam	3	10	90	4.5	68
	Chennai	0	0	95	3.5	52
	Viluppuram	3	3	77	3.5	68
	Ramanathapuram	1	2	55	12	48
	Thoothukudi	1	1	55	7	52
	Tirunelveli	3	3	55	7	48
	Thanjavur	1	2	90	5.5	48
	Tiruvallur	0	5	95	4	56
	Kanyakumari	0	0	45	3	40
Puducherry	Puducherry	3	3	77	3.5	68
	Karaikal	3	10	90	4.5	52
	Yanam	4	17	125	4.5	52
Andaman & Nicobar Islands	Andaman & Nicobar Islands	1	8	90	—	N/A
Total			35			

Table 4: Cyclone parameters for districts along west coast and Lakshadweep Islands

State	Districts	No. of severe Cyclones	Total No. of Cyclones	Wind Speed in knots	PMSS in metres	PMP in cm
Gujarat	Junagadh	4	9	90	3.5	84
	Kachchh	3	7	90	3.5	60
	Bhavnagar	3	5	90	4.5	56
	Jamnagar	1	2	90	3.5	72
	Porbandar	3	3	90	3.5	84
	Amreli	2	3	90	4	56
	Ahmedabad	1	1	90	4.5	60
	Anand	1	2	70	4.5	52
	Surat	0	0	45	4.5	88
	Navsari	0	1	70	4.5	88
	Valsad	0	0	45	5	104
	Bharuch	0	3	70	4.5	72
	Rajkot	2	4	90	3.5	72
	Vadodara	0	1	45	4.5	64
Daman & Diu	Daman	1	1	55	5	80
	Diu	4	9	90	3.5	80
Maharashtra	Thane	2	2	55	5	72
	Mumbai Suburban	1	1	55	5	95
	Ratnagiri	1	1	55	4	64
	Raigarh	0	1	55	5	72
	Sindhudurg	1	1	55	4	72
Goa	North Goa	0	0	55	4.5	64
	South Goa	0	0	55	4.5	64
Karnataka	Uttar Kannada	0	0	45	4.5	68
	Udupi	0	0	45	4.5	68
	Dakshin Kannada	0	0	45	4.5	92
Kerala	Kozhikode	1	1	45	4.5	60
	Malappuram	0	1	45	4.5	60
	Thrissur	0	1	45	4.5	52
	Kasargod	0	0	45	4	48
	Kannur	0	0	45	4	60
	Ernakulam	0	0	45	4	44
	Alappuzha	1	1	45	4	40
	Kollam	0	0	45	3.5	44
	Thiruvananthapuram	1	1	45	3	48
Lakshadweep	Lakshadweep	5	9	90	–	N/A
Puducherry	Mahe	1	1	55	4.5	60
Total No. of Stations	37					

Table 5: Cyclone parameters for districts of India not touching the coast, but within 100 km from the coast

State	Districts	No. of severe Cyclones	Total No. of Cyclones	Wind Speed in knots	PMSS in metres	PMP in cm
Dadra and Nagar Haveli	Dadra and Nagar Haveli	2	2	55	–	80
Gujarat	Surendra Nagar	2	2	55	0	56
	Kheda	0	0	45	0	52
Kerala	Wayanad	0	0	55	0	52
	Palakkad	0	1	55	0	52
	Kottayam	0	0	45	0	48
	Idukki	0	0	45	0	52
	Pathanamthitta	1	1	45	0	48
Tamil Nadu	Tiruvannamalai	0	2	55	0	40
	Ariyalur	0	4	45	0	52
	Sivaganga	0	3	55	0	40
AP	Chittoor	8	15	95	0	60
Orissa	Mayurbhanj	1	10	55	0	56
	Jajpur	0	2	65	0	60
	Keonjhar	0	5	45	0	52
	Dhenkanal	0	3	45	0	44
	Cuttack	1	4	140	0	52
	Nayagarh	1	7	65	0	52
	Gajapati	0	1	100	0	52
West Bengal	Hoogly	3	11	65	0	52
	Bardhaman	0	10	45	0	56
	Kolkata	12	23	115	0	52
	North 24 Parganas	11	23	115	0	52
	Howrah	12	23	115	0	50
Total No. of Stations	24					

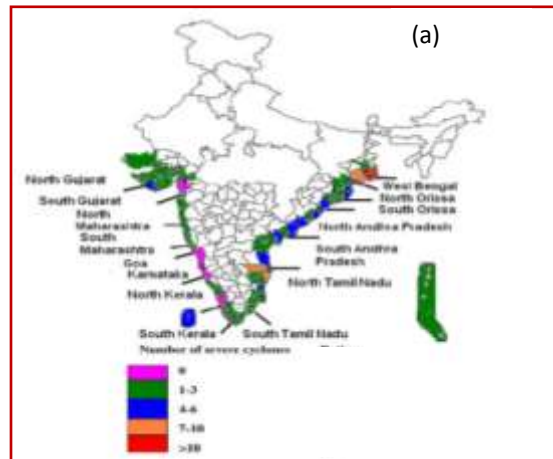


Fig. 2 (a): Number of Severe Cyclones (maximum sustained wind speed (MSW) of 48 knots or more) that affected coastal districts of India during 1891-2008

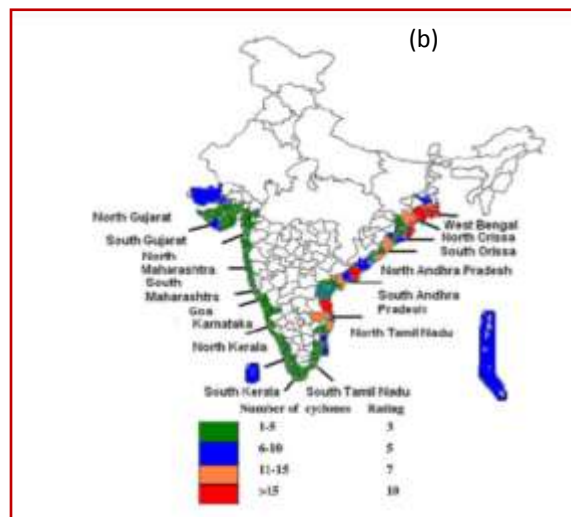


Fig. 2 (b): Number of Cyclones (MSW of 34 knots or more) that affected coastal districts of India during 1891-2008

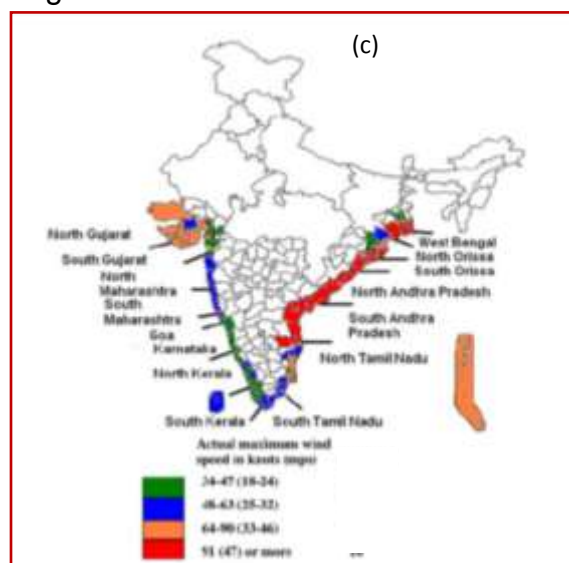


Fig.2 (c): Maximum / Estimated MSW (in mps) that affected coastal districts of India during 1891-2008

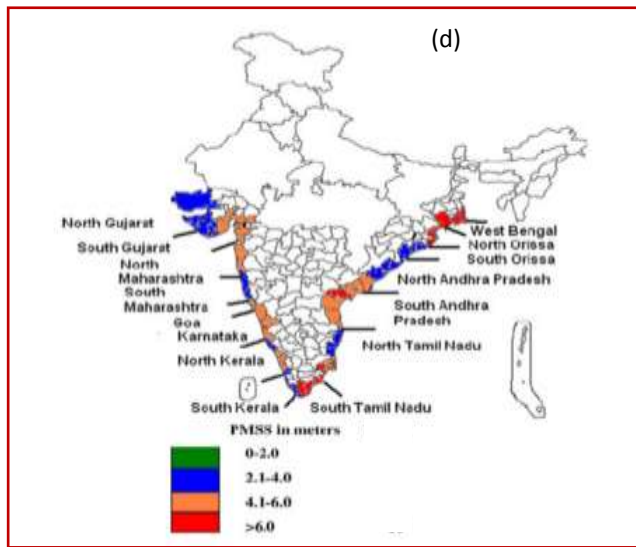


Fig.2 (d): Probable Maximum Storm Surge (in metres) that affected coastal districts of India during 1891-2008

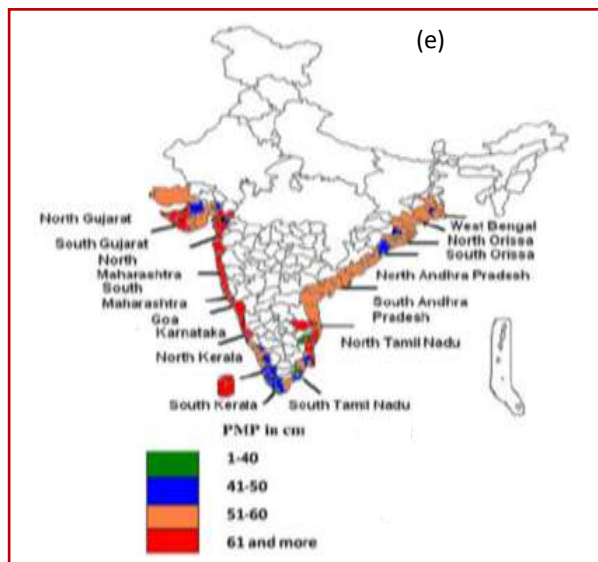


Fig.2 (e): Daily Probable Maximum Precipitation (in cm) that affected coastal districts of India during 1891-2008