

Building a Climate-Resilient Power Sector

Geospatial Technologies for Climate Action in Bangladesh

*Side Event on
Frontier Technologies for Climate Action and Resilience: Connecting Data, Trust and Incentives
The Fifth Session of the Committee on CICTSTI*

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Outline

- Introduction
- Current and future tropical **cyclone** hazards
- Current and future **flood** hazards
- Climate Risk **Geoportal** for Bangladesh

Introduction

Objective

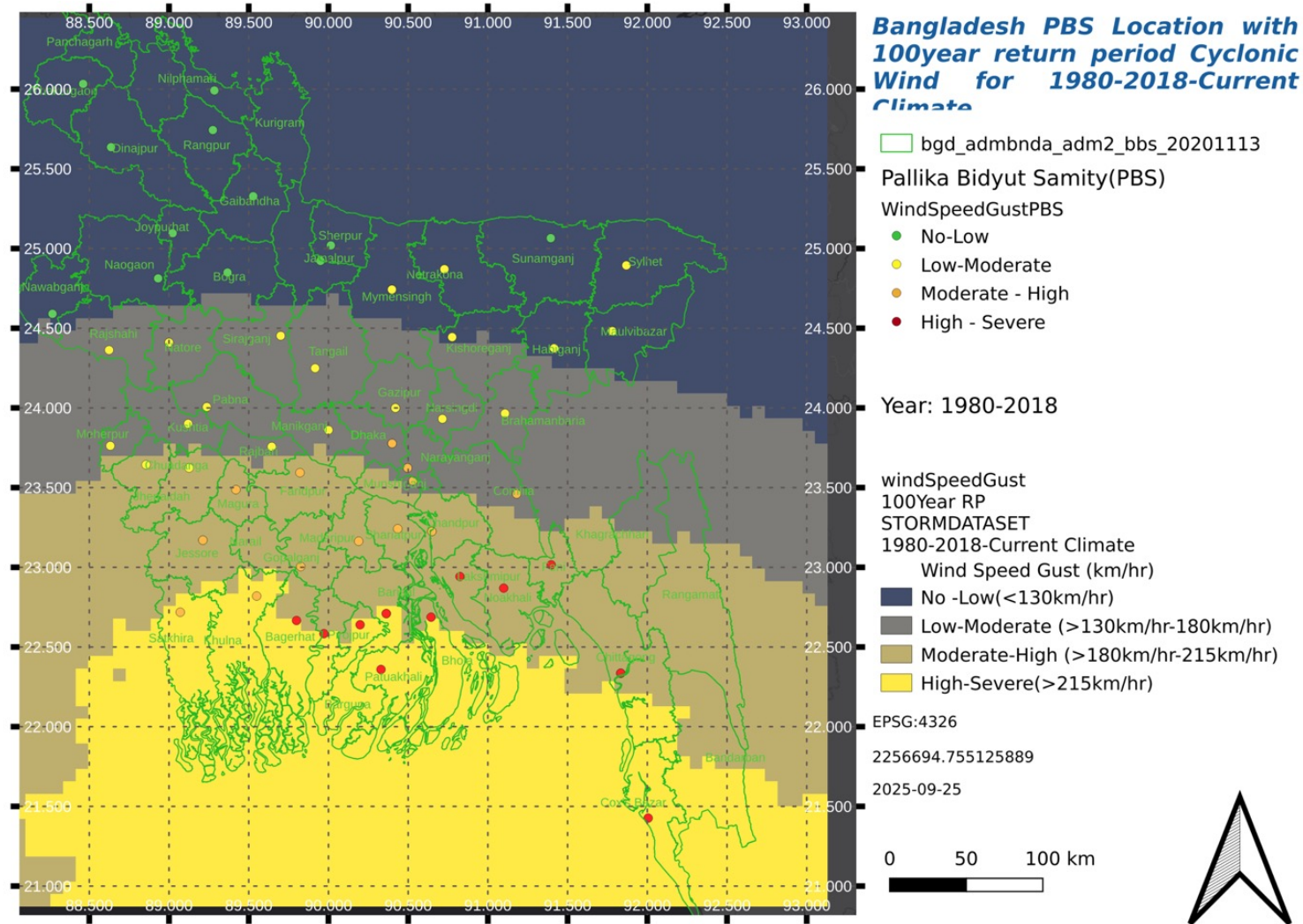
To equip the Government of Bangladesh and power sector agencies with resources to facilitate asset and system-level resilience planning and policy under uncertainty.

Activities

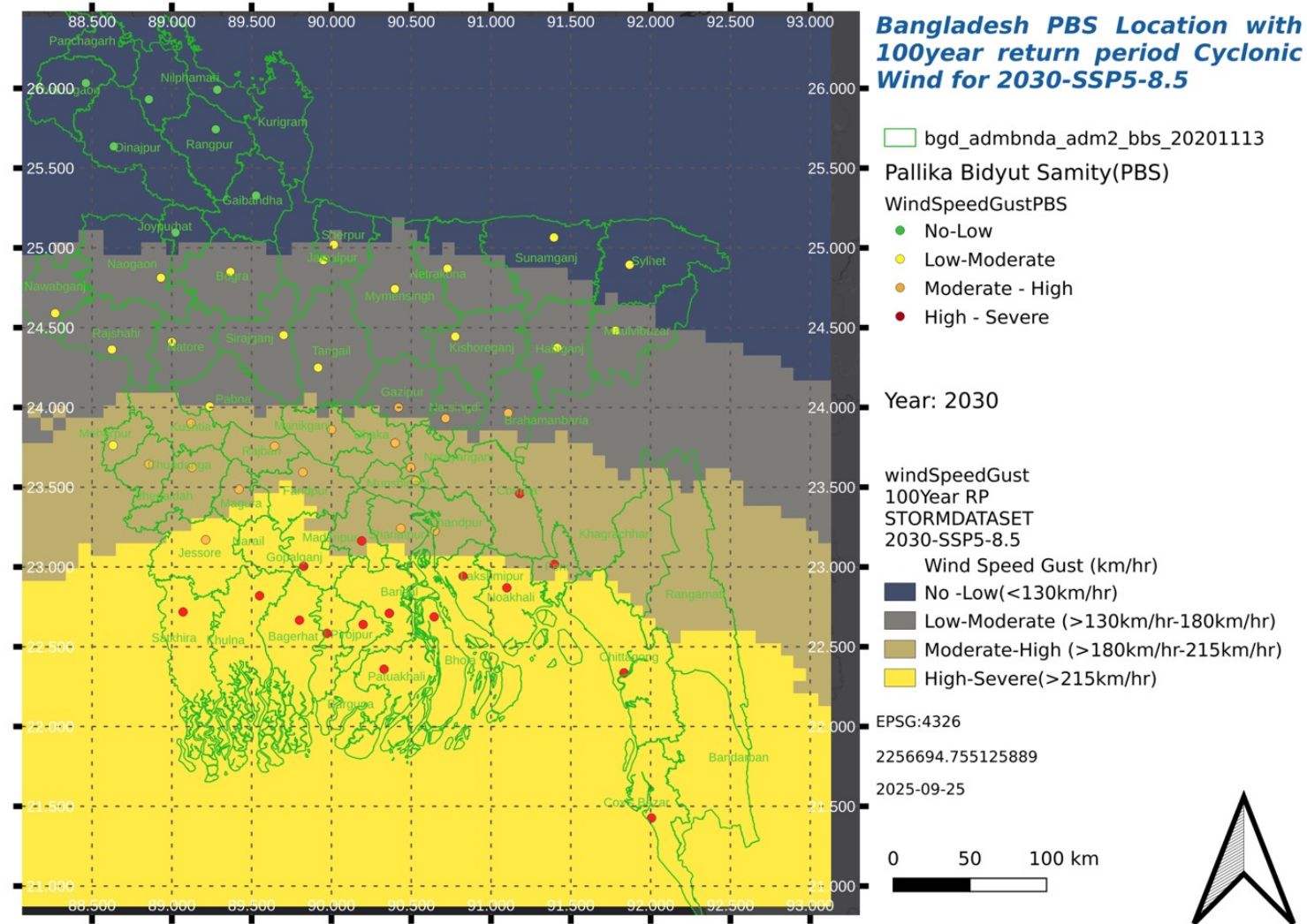
- Development of the spatial distribution of hazards like cyclones and floods.
- Exposure assessment of power system assets

Exposure of Palli Bidduyt Samiti (PBS) to Tropical Cyclones (Wind)

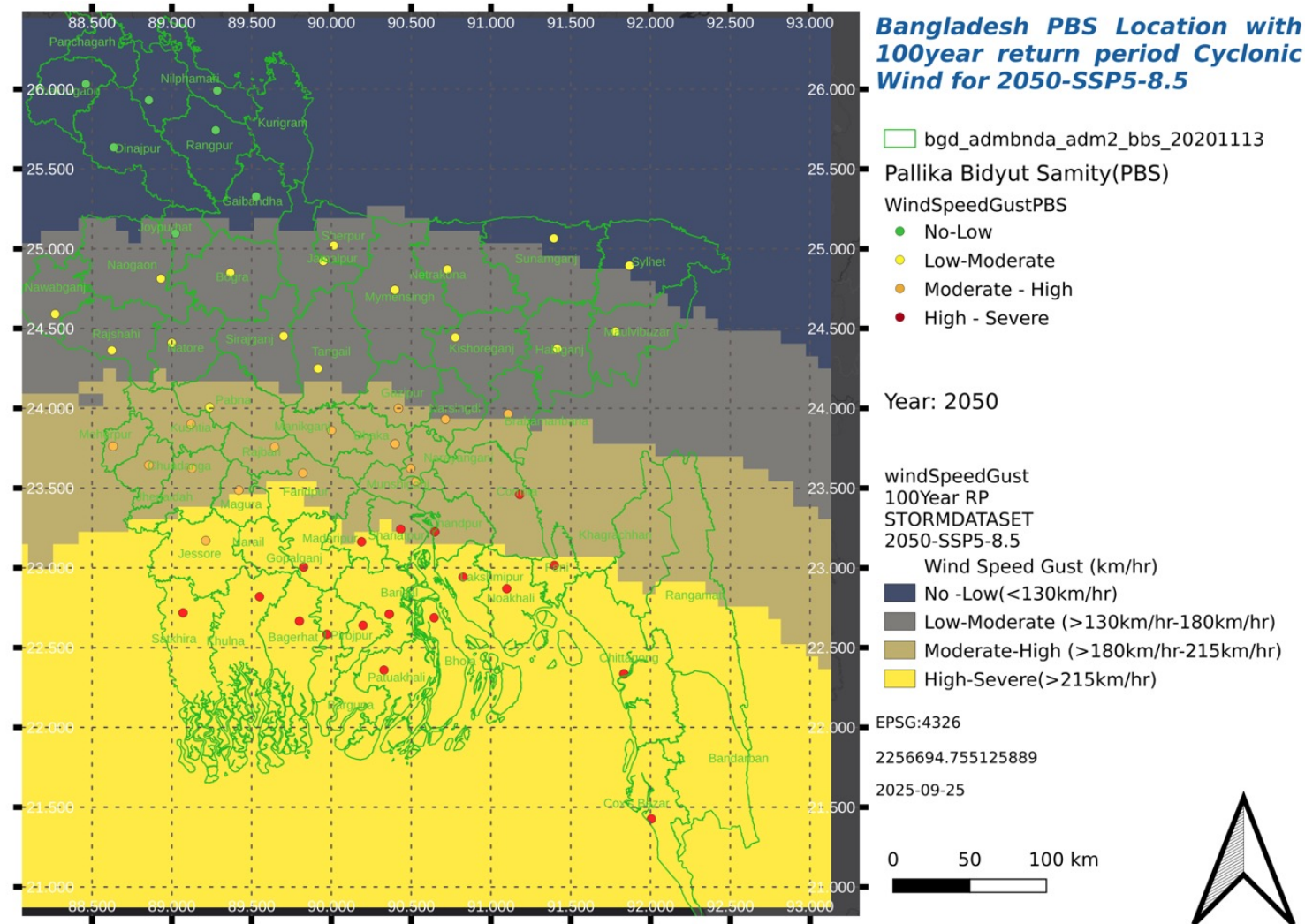
PBS Exposed to Cyclone – Baseline (1980-2018 Data)



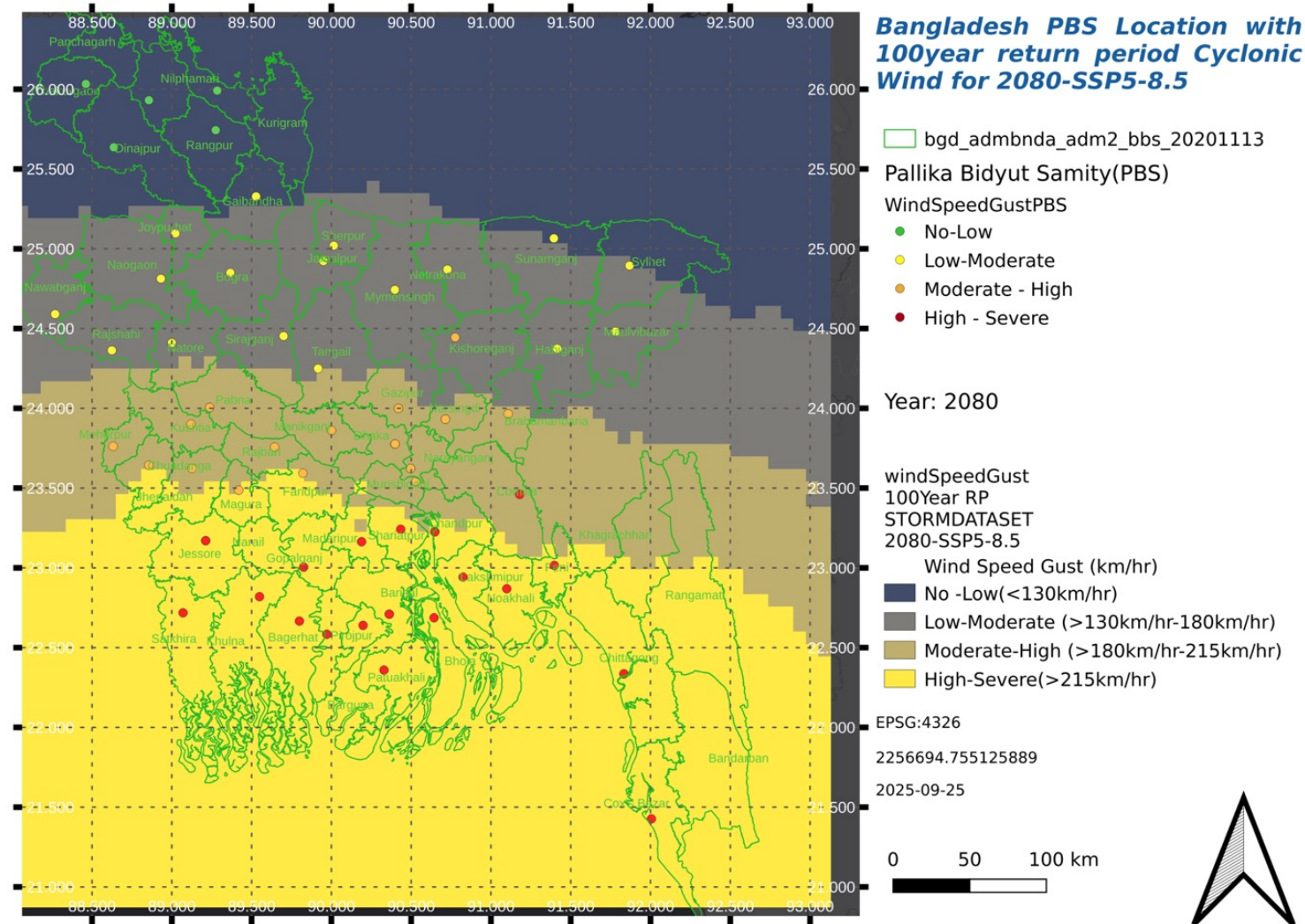
PBS Exposed to a 100 yr. Return Period Cyclone – 2030 (SSP5-8.5)



PBS Exposed to a 100 yr. Return Period Cyclone – 2050 (SSP5-8.5)



PBS Exposed to a 100 yr. Return Period Cyclone – 2080 (SSP5-8.5)

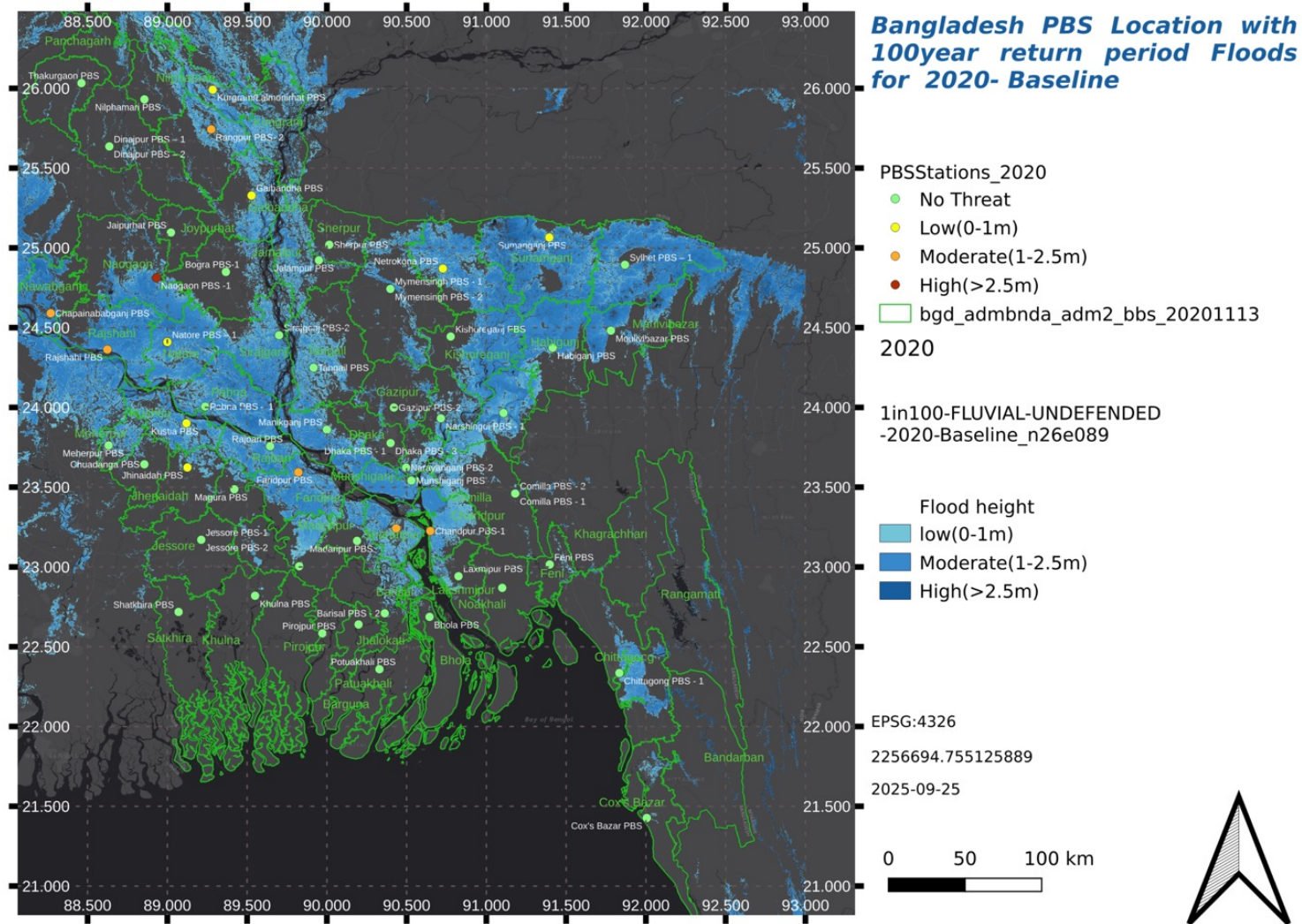


PBSs exposed to 100-year cyclones of 3-sec gust-wind over 200 km/hr

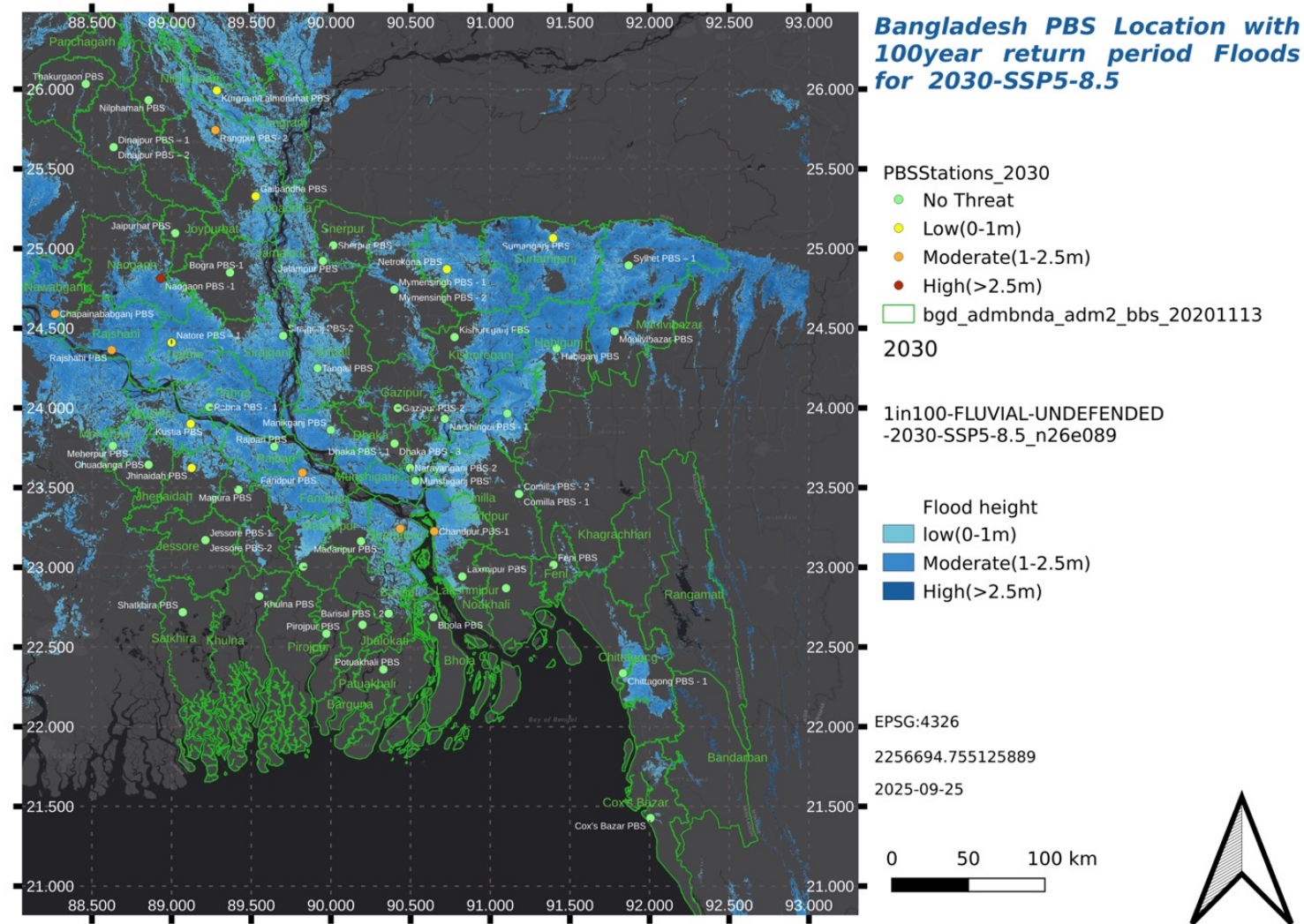
SN	PBS	2020	2030				2050				2080				Remarks
		Base	1.2-6	2.4-5	3-7.0	5-8.5	1.2-6	2.4-5	3-7.0	5-8.5	1.2-6	2.4-5	3-7.0	5-8.5	
1	Bagerhat PBS	227.5	242.6	244.5	246.4	250.2	237.7	244.5	250.2	257.1	233.9	248.1	255.9	262.3	-
2	Barisal-1	230.8	246.1	248.1	250.0	253.8	241.1	248.1	253.8	260.8	237.2	251.7	259.6	266.1	-
3	Barisal-2	225.0	240.0	241.9	243.8	247.5	235.1	241.9	247.5	254.3	231.3	245.4	253.1	259.5	-
4	Bhola	232.3	247.8	249.7	251.7	255.5	242.8	249.7	255.5	262.5	238.8	253.4	261.3	267.9	-
5	Chandpur-1	198.0	211.2	212.9	214.5	217.8	206.9	212.9	217.8	223.8	203.6	216.0	222.8	228.3	+EQ
6	Chandpur-2	192.4	205.2	206.8	208.4	211.6	201.0	206.8	211.6	217.4	197.8	209.8	216.4	221.8	+FL
7	Chittagong-1	223.9	238.8	240.7	242.6	246.3	234.0	240.7	246.3	253.0	230.2	244.2	251.9	258.2	+EQ & FL
8	Chittagong-2	208.0	221.8	223.6	225.3	228.8	217.3	223.6	228.8	235.0	213.8	226.8	234.0	239.8	+EQ
9	Chittagong-3	214.4	228.7	230.5	232.3	235.9	224.1	230.5	235.9	242.3	220.5	233.9	241.2	247.3	+EQ
10	Comilla-4	194.9	207.9	209.5	211.1	214.4	203.6	209.5	214.4	220.2	200.4	212.5	219.2	224.7	+EQ
11	Cox's Bazar	240.4	256.5	258.5	260.5	264.5	251.3	258.5	264.5	271.7	247.2	262.2	270.5	277.3	+EQ
12	Faridpur	212.9	227.0	228.8	230.6	234.1	222.4	228.8	234.1	240.5	218.8	232.1	239.5	245.5	-
13	Feni	201.5	214.9	216.6	218.3	221.6	210.6	216.6	221.6	227.7	207.2	219.8	226.7	232.3	-
14	Gopalganj	221.9	236.7	238.5	240.4	244.1	231.8	238.5	244.1	250.7	228.1	242.0	249.6	255.8	-
15	Jessore-1	217.1	231.6	233.4	235.2	238.9	226.9	233.4	238.9	245.4	223.2	236.8	244.3	250.4	-
16	Jessore-2	222.7	237.5	239.4	241.3	245.0	232.7	239.4	245.0	251.6	229.0	242.9	250.5	256.8	-
17	Jhalokathi	237.7	253.6	255.6	257.5	261.5	248.4	255.6	261.5	268.6	244.4	259.3	267.4	274.1	-
18	Jhinaidah	198.5	211.7	213.4	215.0	218.3	207.4	213.4	218.3	224.3	204.1	216.5	223.3	228.9	-
19	Khulna	229.0	244.3	246.2	248.1	251.9	239.3	246.2	251.9	258.8	235.5	249.8	257.7	264.1	-
20	Laxmipur	207.1	221.0	222.7	224.4	227.9	216.5	222.7	227.9	234.1	213.0	225.9	233.0	238.9	-
21	Madaripur	203.1	216.6	218.3	220.0	223.4	212.2	218.3	223.4	229.5	208.8	221.5	228.5	234.2	-
22	Magura	210.3	224.4	226.1	227.9	231.4	219.8	226.1	231.4	237.7	216.3	229.4	236.6	242.5	-
23	Noakhali	206.2	219.9	221.6	223.3	226.8	215.4	221.6	226.8	233.0	212.0	224.8	231.9	237.7	-
24	Pirojpur	234.0	249.6	251.5	253.5	257.4	244.5	251.5	257.4	264.4	240.5	255.2	263.2	269.8	-
25	Potua khali	234.8	250.4	252.4	254.3	258.2	245.3	252.4	258.2	265.3	241.4	256.0	264.1	270.7	-
26	Rajbari	183.7	195.9	191.9	188.8	197.4	197.4	200.3	199.0	202.0	206.6	202.0	207.5	211.8	-
27	Shariyatpur	206.0	219.7	215.2	211.7	221.4	221.4	224.6	223.1	226.6	231.7	226.6	232.7	237.5	-
28	Shatkhira	238.9	254.8	249.6	245.6	256.8	256.8	260.5	258.8	262.7	268.7	262.7	269.9	275.4	-

Exposure of Palli Bidduyt Samiti (PBS) to Riverine Floods

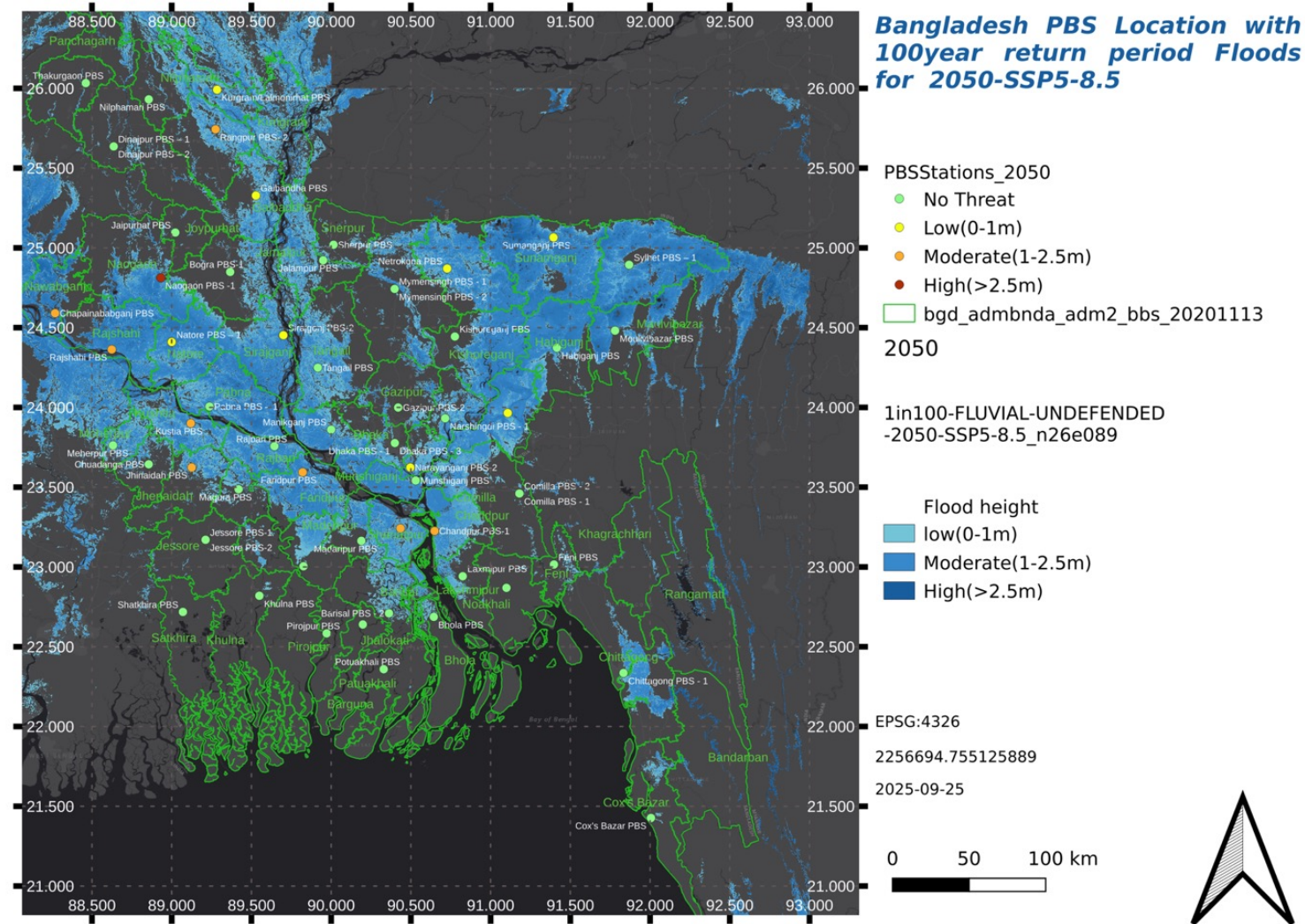
PBS Exposed to a 100 yr. Riverine Flood – Baseline (2020)



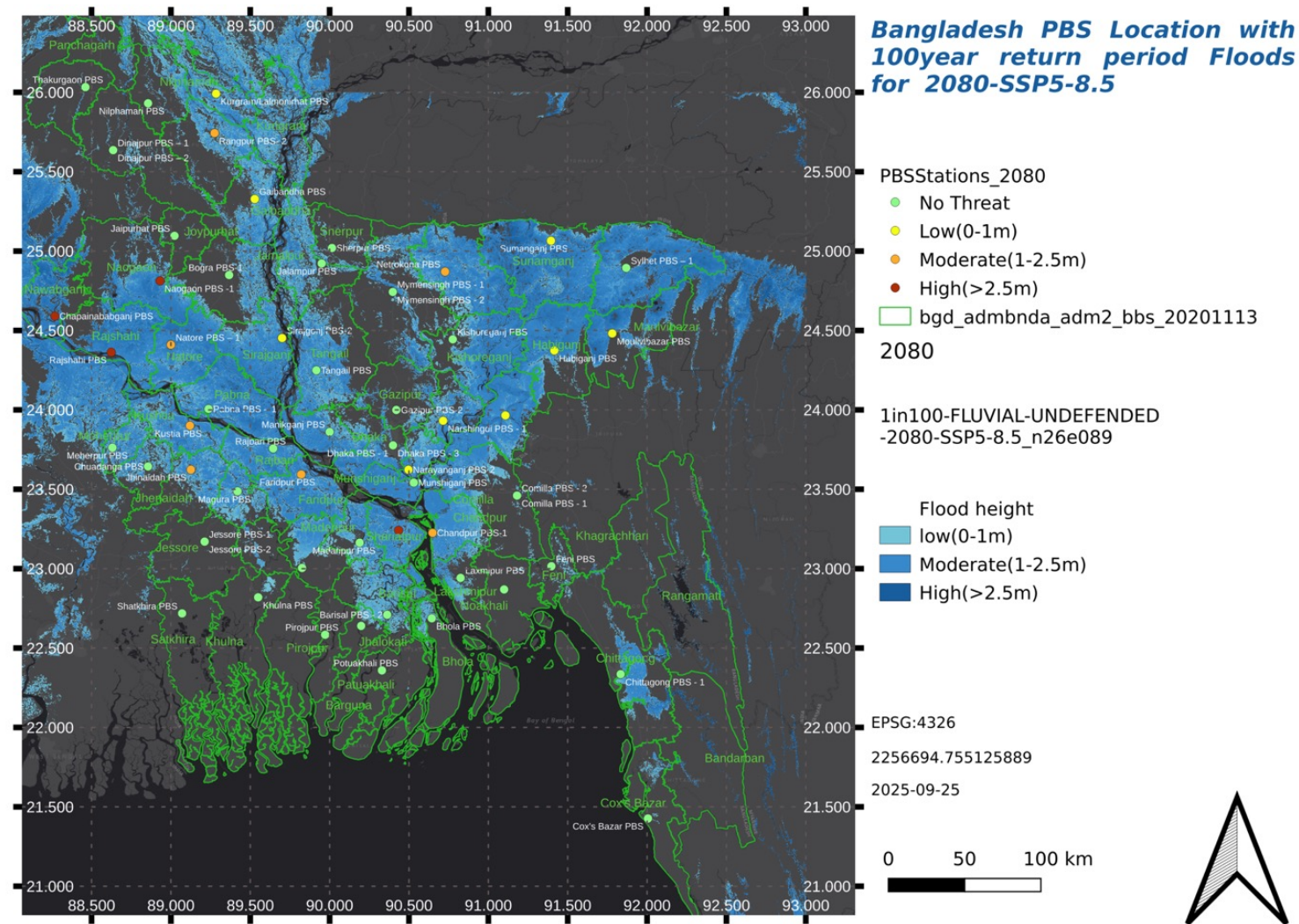
PBS Exposed to a 100 yr. Return Period Riverine Flood – 2030 (SSP5-8.5)



PBS Exposed to a 100 yr. Return Period Riverine Flood – 2050 (SSP5-8.5)



PBS Exposed to a 100 yr. Return Period Riverine Flood – 2080 (SSP5-8.5)



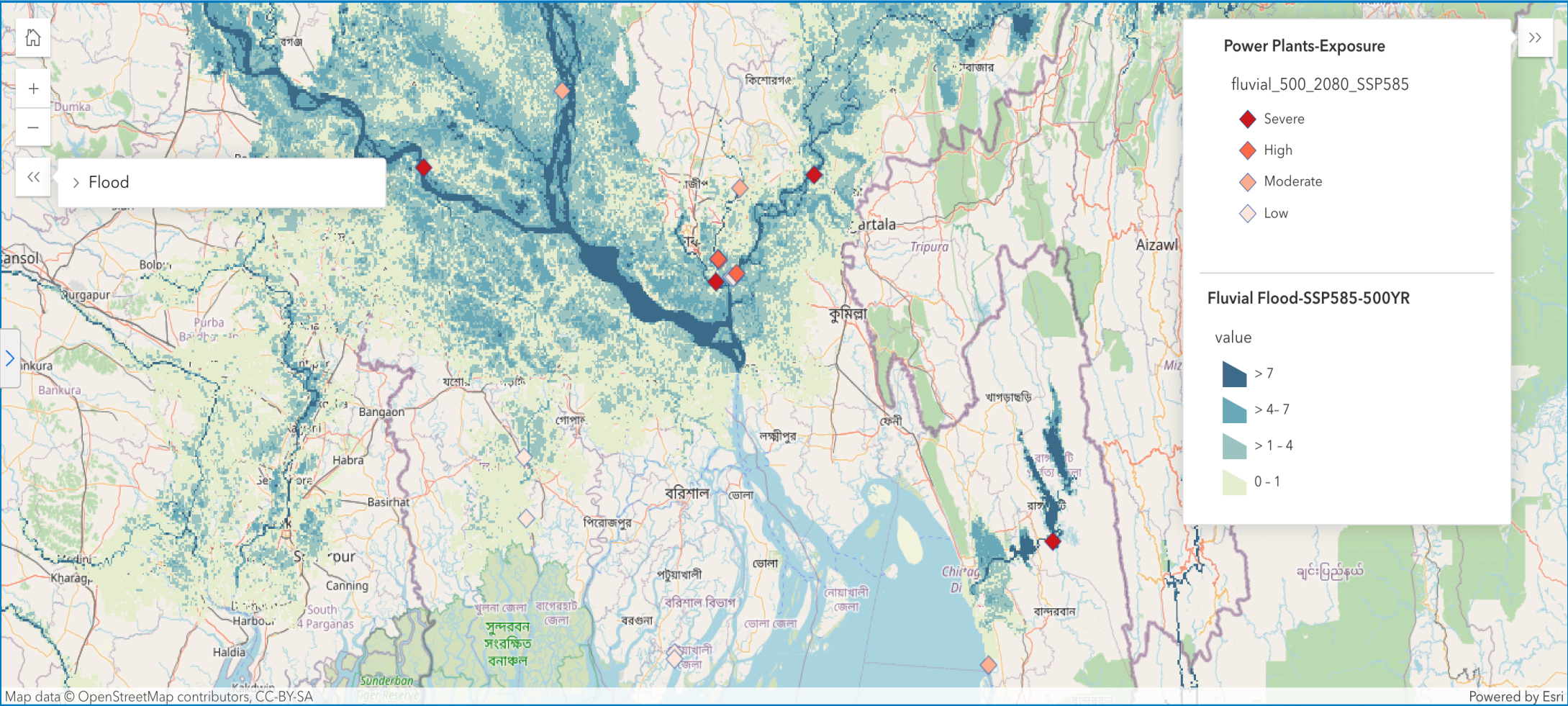
PBS Exposed to a 100 yr. Return Period Riverine Flood

SN	PBS	2020	2030				2050				2080				Remarks
		Base	1.2-6	2.4-5	3-7.0	5-8.5	1.2-6	2.4-5	3-7.0	5-8.5	1.2-6	2.4-5	3-7.0	5-8.5	
1	Chandpur-2	2.66	2.73	2.73	2.74	2.76	2.8	2.87	2.91	2.98	2.82	3.02	3.19	3.33	+ Wind
2	Chittagong-1	2.51	2.57	2.57	2.58	2.60	2.63	2.69	2.72	2.78	2.65	2.82	2.97	3.09	+ Wind
3	Comilla-1	1.64	1.74	1.75	1.76	1.79	1.83	1.91	1.97	2.06	1.86	2.11	2.33	2.48	+ Wind
4	Comilla-2	0.43	0.44	0.44	0.44	0.44	0.45	0.46	0.48	0.52	0.45	0.56	1.13	1.56	-
5	Dhaka-4	0.54	0.72	0.74	0.74	0.83	0.96	1.18	1.33	1.59	1.03	1.75	2.32	2.61	-
6	Kustia	0.91	0.98	0.98	0.99	1.01	1.05	1.11	1.14	1.19	1.06	1.22	1.36	1.47	-
7	Manikganj	1.38	1.41	1.41	1.41	1.42	1.43	1.46	1.47	1.50	1.44	1.51	1.59	1.65	-
8	Moulivibazar	0.51	0.66	0.67	0.67	0.73	0.82	0.96	1.05	1.21	0.86	1.30	1.66	1.98	-
9	Munshiganj	2.66	2.76	2.77	2.78	2.80	2.84	2.9	2.93	2.99	2.86	3.03	3.19	3.32	+ Wind
10	Narshingdi-2	0.51	0.62	0.63	0.64	0.67	0.73	0.83	0.89	1.00	0.76	1.07	1.35	1.57	+ EQ
11	Natore-1	1.32	1.47	1.49	1.49	1.54	1.62	1.74	1.82	1.95	1.66	2.04	2.38	2.66	-
12	Natore-2	2.98	3.04	3.04	3.05	3.07	3.11	3.18	3.22	3.28	3.13	3.32	3.51	3.67	-
13	Pabna-2	1.58	1.66	1.66	1.67	1.70	1.75	1.83	1.89	1.98	1.77	2.04	2.29	2.49	-
14	Rajbari	1.44	1.46	1.46	1.46	1.47	1.48	1.50	1.51	1.53	1.48	1.54	1.59	1.64	+ Wind
15	Rajshahi	1.98	2.06	2.06	2.07	2.09	2.13	2.2	2.24	2.30	2.15	2.34	2.52	2.67	-
16	Shariyatpur	1.38	1.46	1.46	1.47	1.49	1.54	1.60	1.65	1.72	1.56	1.77	1.96	2.10	+ Wind
17	Sirajgonj-1	2.10	2.20	2.21	2.22	2.25	2.31	2.41	2.46	2.55	2.34	2.60	2.82	3.02	-
18	Sumanganj	3.67	3.76	3.77	3.78	3.81	3.86	3.95	4.01	4.10	3.89	4.16	4.4	4.74	+ EQ
19	Sylhet-1	4.03	4.09	4.1	4.10	4.12	4.15	4.2	4.23	4.29	4.16	4.33	4.48	4.61	+ EQ
20	Sylhet-2	3.29	3.35	3.36	3.36	3.38	3.41	3.47	3.50	3.56	3.43	3.60	3.79	3.95	+ EQ
21	Tangail	1.35	1.48	1.49	1.50	1.54	1.62	1.74	1.81	1.92	1.66	1.99	2.26	2.49	+ EQ

Geoportal for Climate Risk in Bangladesh

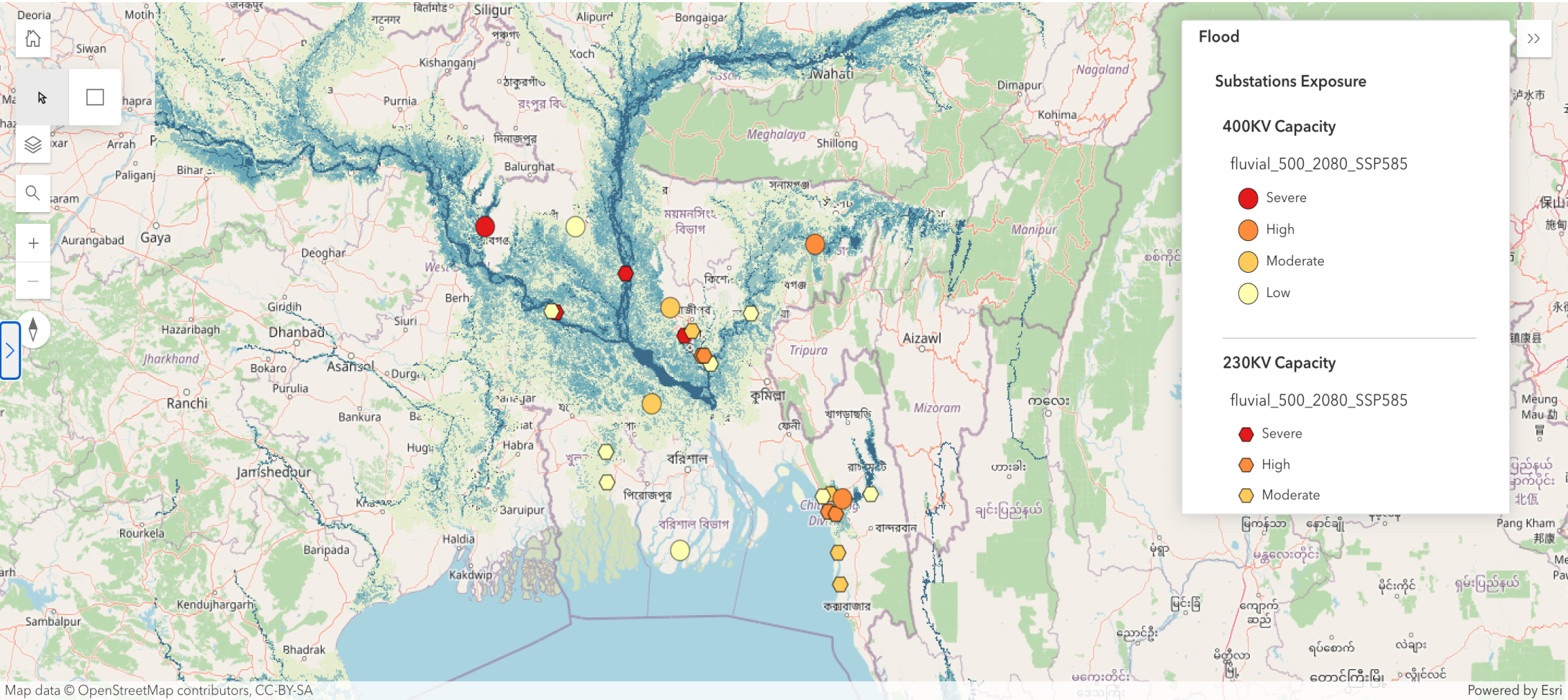
Geo Portal - Exposure of Power Plants to 500 yr Flood for SSP 5-8.5

PowerPlants Exposure to Riverine Flood



Exposure of Sub-Stations to 500 yr Flood for SSP 5-8.5

Substations Exposed to River Flood



Conclusions

Tropical Cyclone (Wind)

- Wind risk is increased near the coast of Bangladesh and decreased farther inland.
- There is a significant risk to the power sector assets from tropical cyclones.

Riverine Flood

- The intensity riverine flood hazard in Bangladesh will increase over time.
- More power sector assets will be exposed to floods in the future.



THANK YOU

