Hands-on

Coastal Risk Assessment (Storm Surge)

Training Course on

"Geospatial Techniques for Coastal Mapping and Monitoring "

26-30 November, 2018

Dr. P C Mohanty

mohanty@incois.gov.in

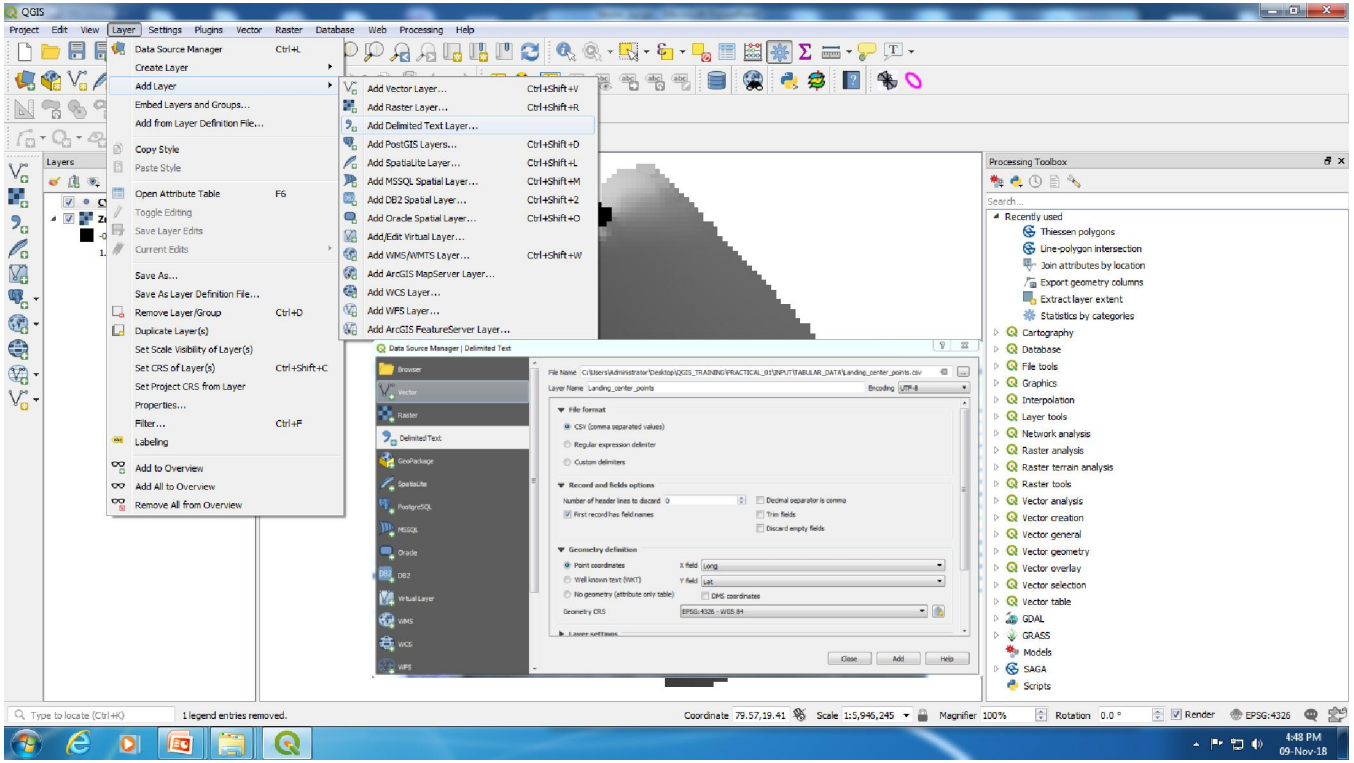
International Training Centre for operational Oceanography (ITCO),
INCOIS, Hyderabad, India

Over view of Course

- Maximum Wave height due to Phailin cyclone South Orissa coast
- Extract Wave height either side of the cyclonic land fall point
- Create buffer (multi buffer zone: 2, 5, 10, 20, 30, 40, 50, 100km) around the land fall point
- Calculate Statistics w.r.t different zone
- Generation of storm hazard map

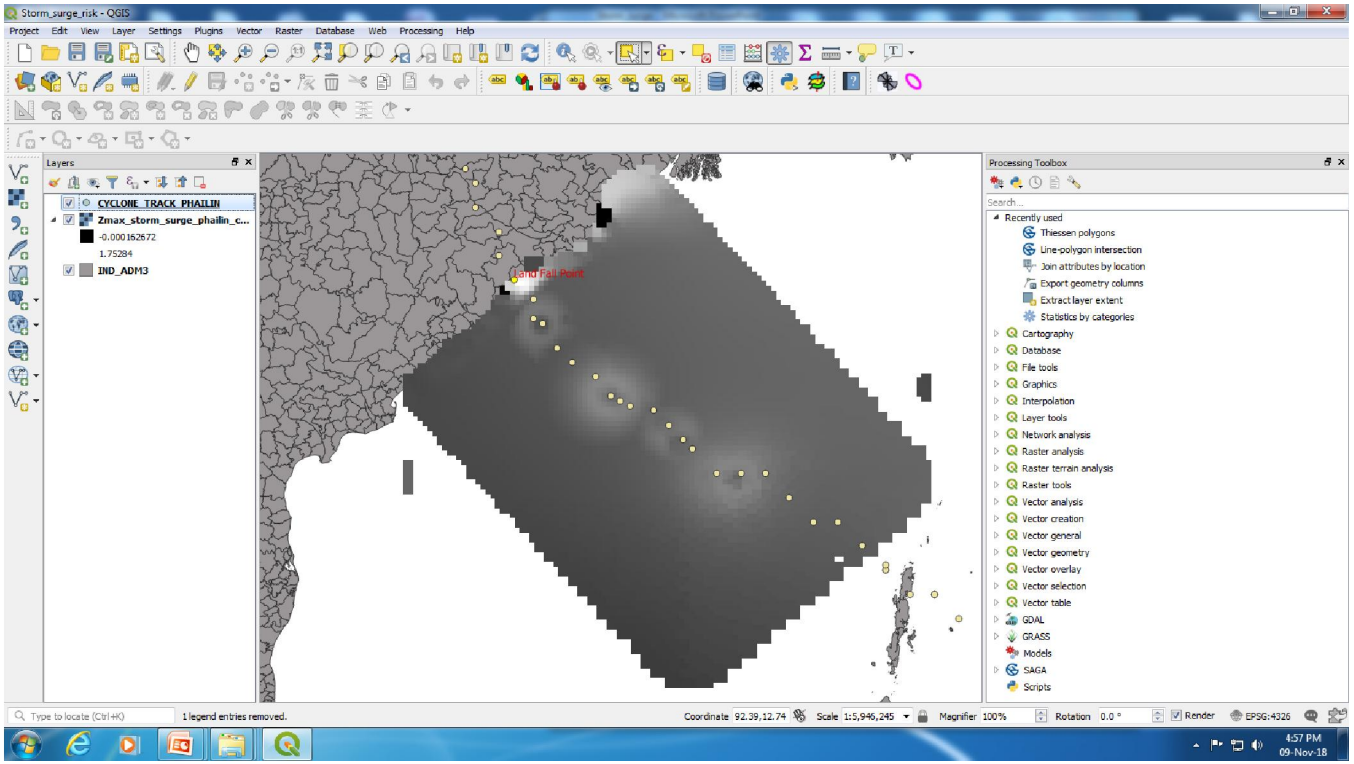
Import cyclone track data of CSV file to .shp file :

- Go to layer>add layer>delimited text layer> New window will pop-up> open CSV(MS-DOS) and enter long and lat Coolum> file save as .shp file. > add coordinate to point > save new file (Say Cyclone_track.shp)



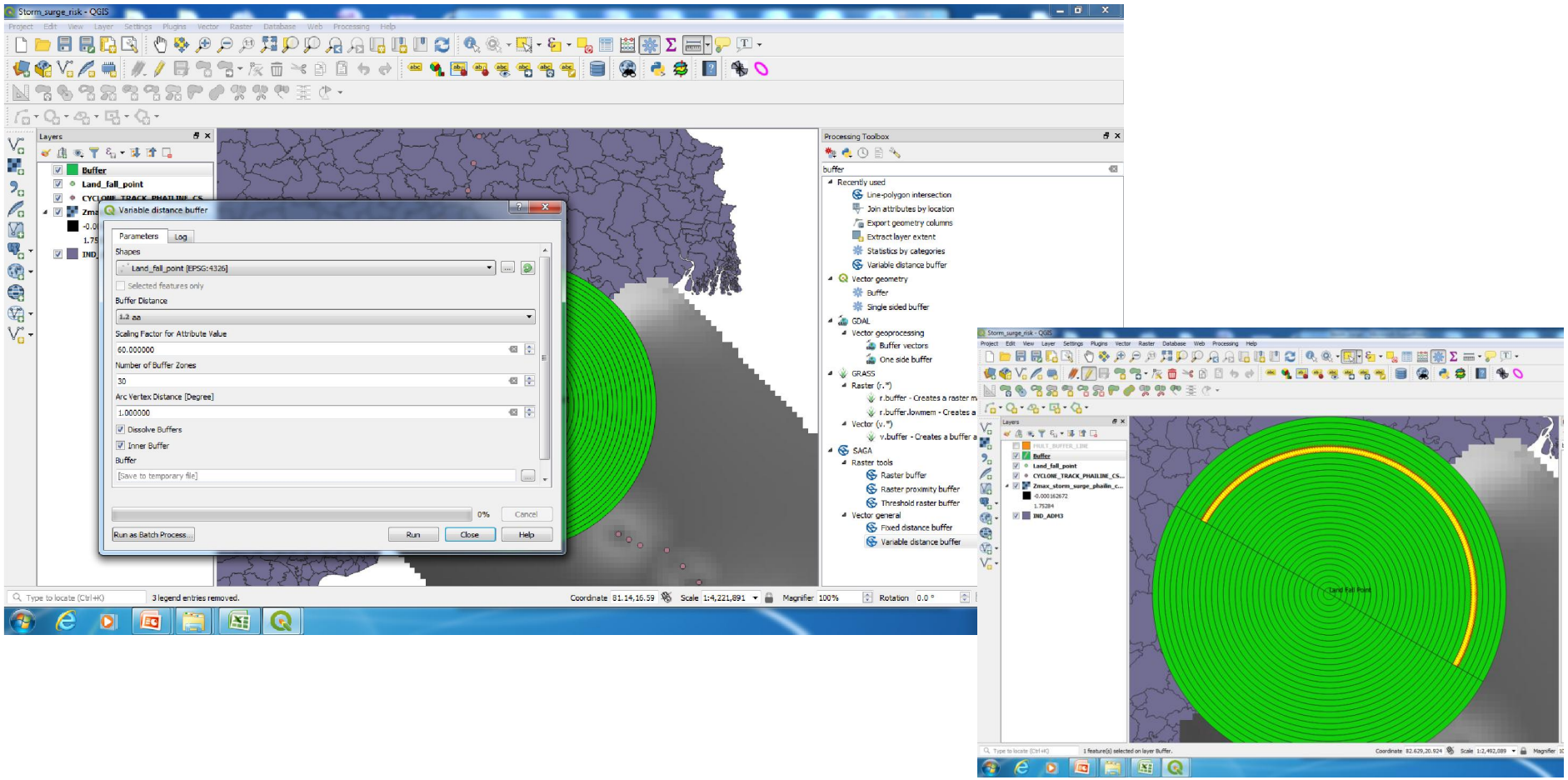
Locate Land Fall point and create multiple Buffer

- Go to layer>add layer>delimited text layer> New window will pop-up> open CSV(MS-DOS) and enter long and lat Coolum> file save as .shp file. > add coordinate to point > save new file (Say Cyclone_track.shp)



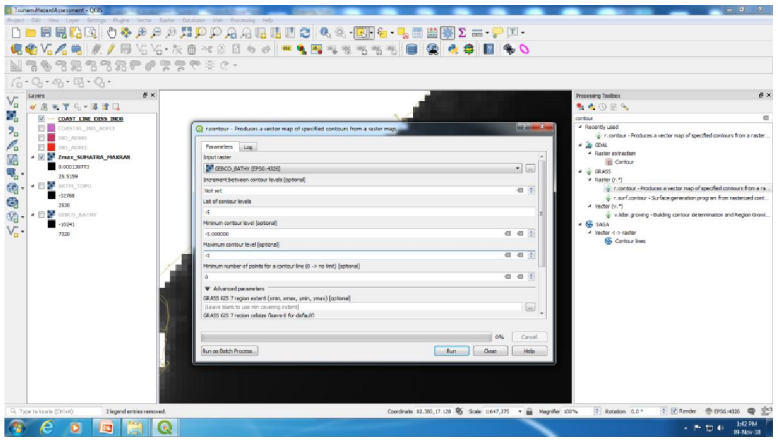
Multi-Buffer:

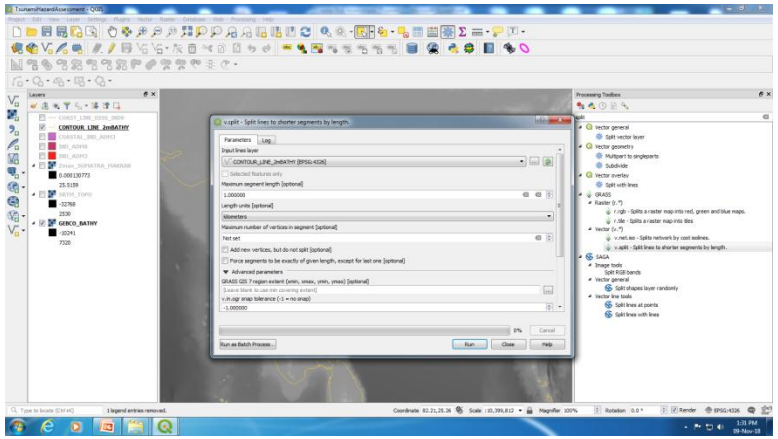
- Draw every 10km interval buffer line using Variable distance buffer tool [insert buffer distance as 0.045 (field has to create), scale factor 60 and no. of buffer line is 30]
- Split Buffer into two part to divided left and right side of the cyclone track using editing mode

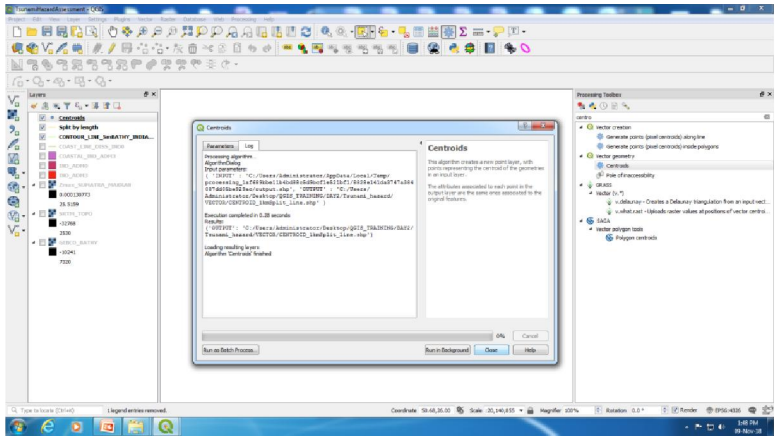


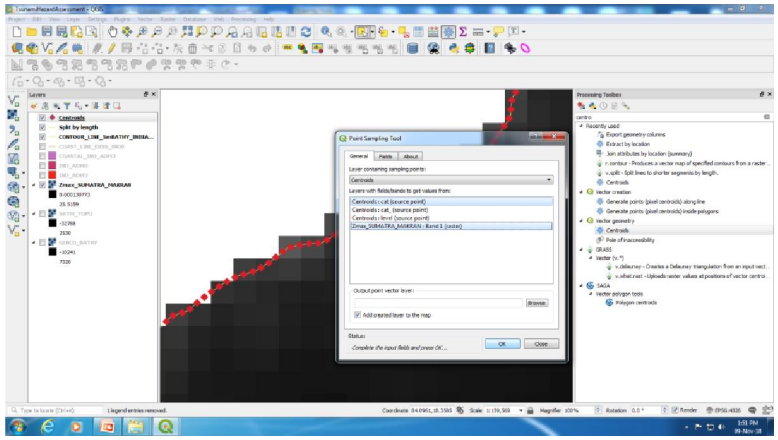
Storm Surge Extraction

Extract storm surge Height: create contour line (-5m) from GEBCO_BATHY.tif file using Specified contour from raster tool> split 1km segment using split line to shorter segment by length tool> generate split line to point using centroids tool> Extract storm surge height at the point location using point sampling tool (Say StormSurgeHeight_pointLocation.shp)



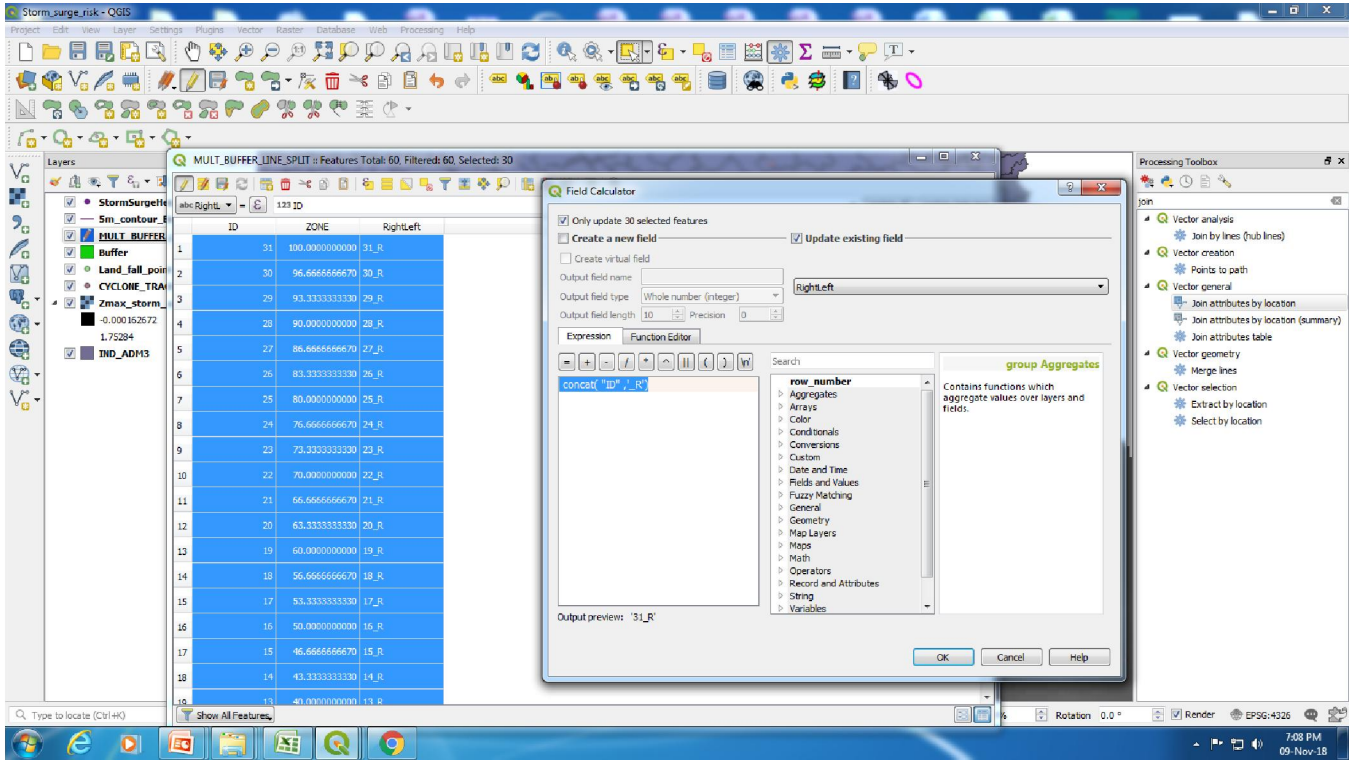




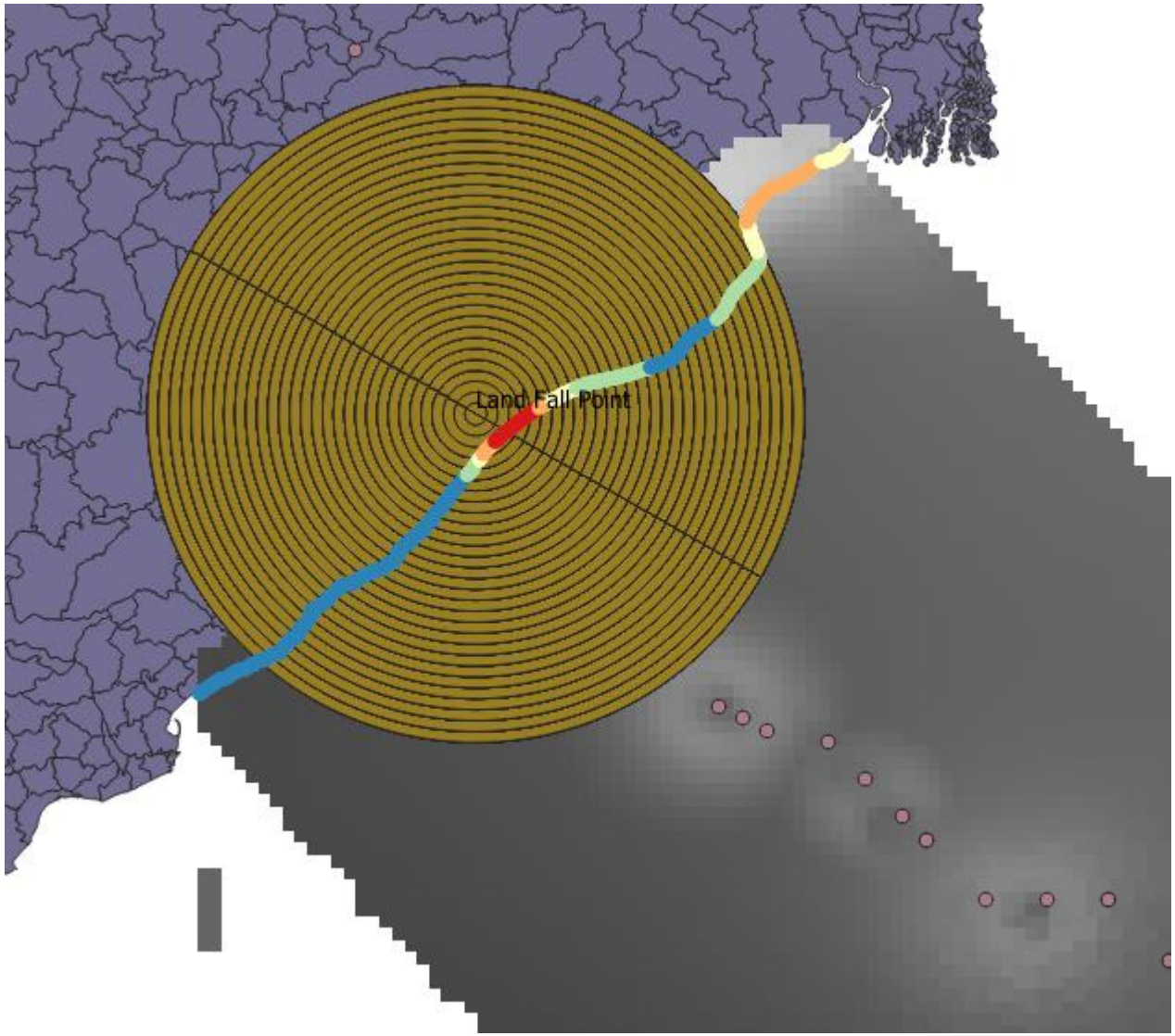


Calculation Risk Rating

Create New Field> Select Left and right side of the buffer and Name them using concat string calculator

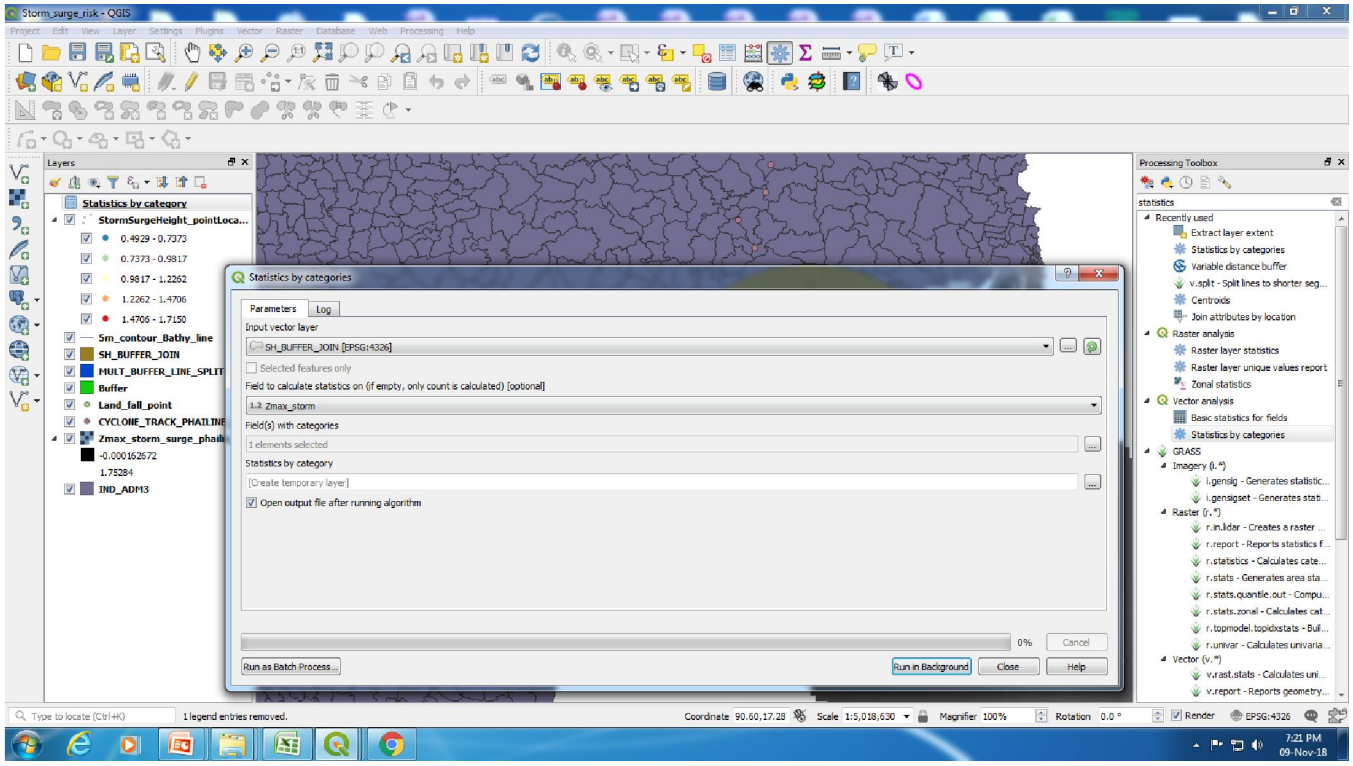


Generate Hazard Maps

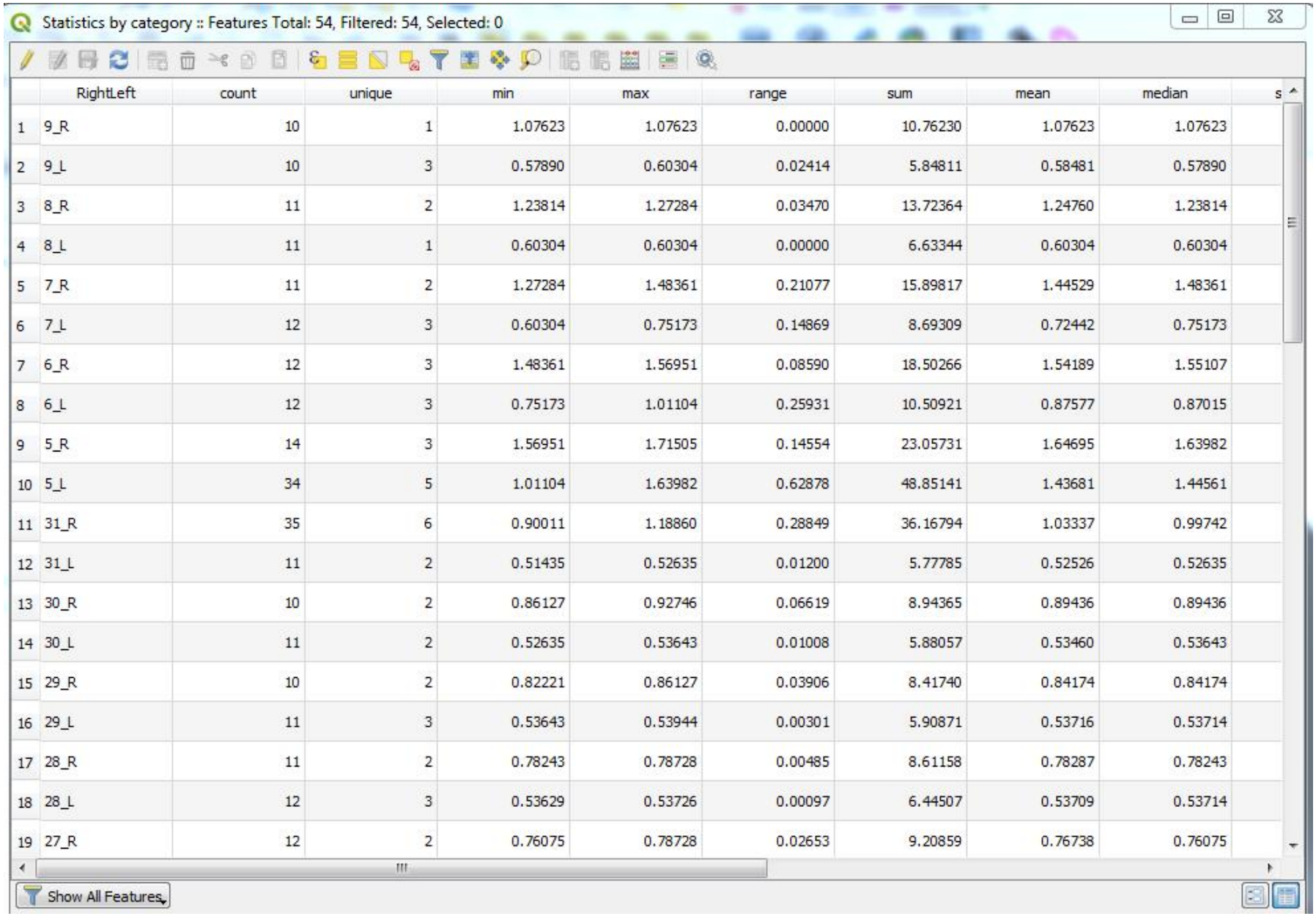


Extraction of Statistics

Calculate Statistics (Mean, Nin, Max and SD of Zmax and length of the coast in each taluk. Using Statistics by category tool (here calculate zmax value using the Buffer (RightLeft) filed category



Zonewise Statistics Table


Statistics by category :: Features Total: 54, Filtered: 54, Selected: 0

	RightLeft	count	unique	min	max	range	sum	mean	median	s
1	9_R	10	1	1.07623	1.07623	0.00000	10.76230	1.07623	1.07623	
2	9_L	10	3	0.57890	0.60304	0.02414	5.84811	0.58481	0.57890	
3	8_R	11	2	1.23814	1.27284	0.03470	13.72364	1.24760	1.23814	
4	8_L	11	1	0.60304	0.60304	0.00000	6.63344	0.60304	0.60304	
5	7_R	11	2	1.27284	1.48361	0.21077	15.89817	1.44529	1.48361	
6	7_L	12	3	0.60304	0.75173	0.14869	8.69309	0.72442	0.75173	
7	6_R	12	3	1.48361	1.56951	0.08590	18.50266	1.54189	1.55107	
8	6_L	12	3	0.75173	1.01104	0.25931	10.50921	0.87577	0.87015	
9	5_R	14	3	1.56951	1.71505	0.14554	23.05731	1.64695	1.63982	
10	5_L	34	5	1.01104	1.63982	0.62878	48.85141	1.43681	1.44561	
11	31_R	35	6	0.90011	1.18860	0.28849	36.16794	1.03337	0.99742	
12	31_L	11	2	0.51435	0.52635	0.01200	5.77785	0.52526	0.52635	
13	30_R	10	2	0.86127	0.92746	0.06619	8.94365	0.89436	0.89436	
14	30_L	11	2	0.52635	0.53643	0.01008	5.88057	0.53460	0.53643	
15	29_R	10	2	0.82221	0.86127	0.03906	8.41740	0.84174	0.84174	
16	29_L	11	3	0.53643	0.53944	0.00301	5.90871	0.53716	0.53714	
17	28_R	11	2	0.78243	0.78728	0.00485	8.61158	0.78287	0.78243	
18	28_L	12	3	0.53629	0.53726	0.00097	6.44507	0.53709	0.53714	
19	27_R	12	2	0.76075	0.78728	0.02653	9.20859	0.76738	0.76075	

Show All Features

Thank you