

Analysis of Climate Indices in Climate Change Scenarios Applying Spatial Data Correction The case of Guayas Province, Ecuador

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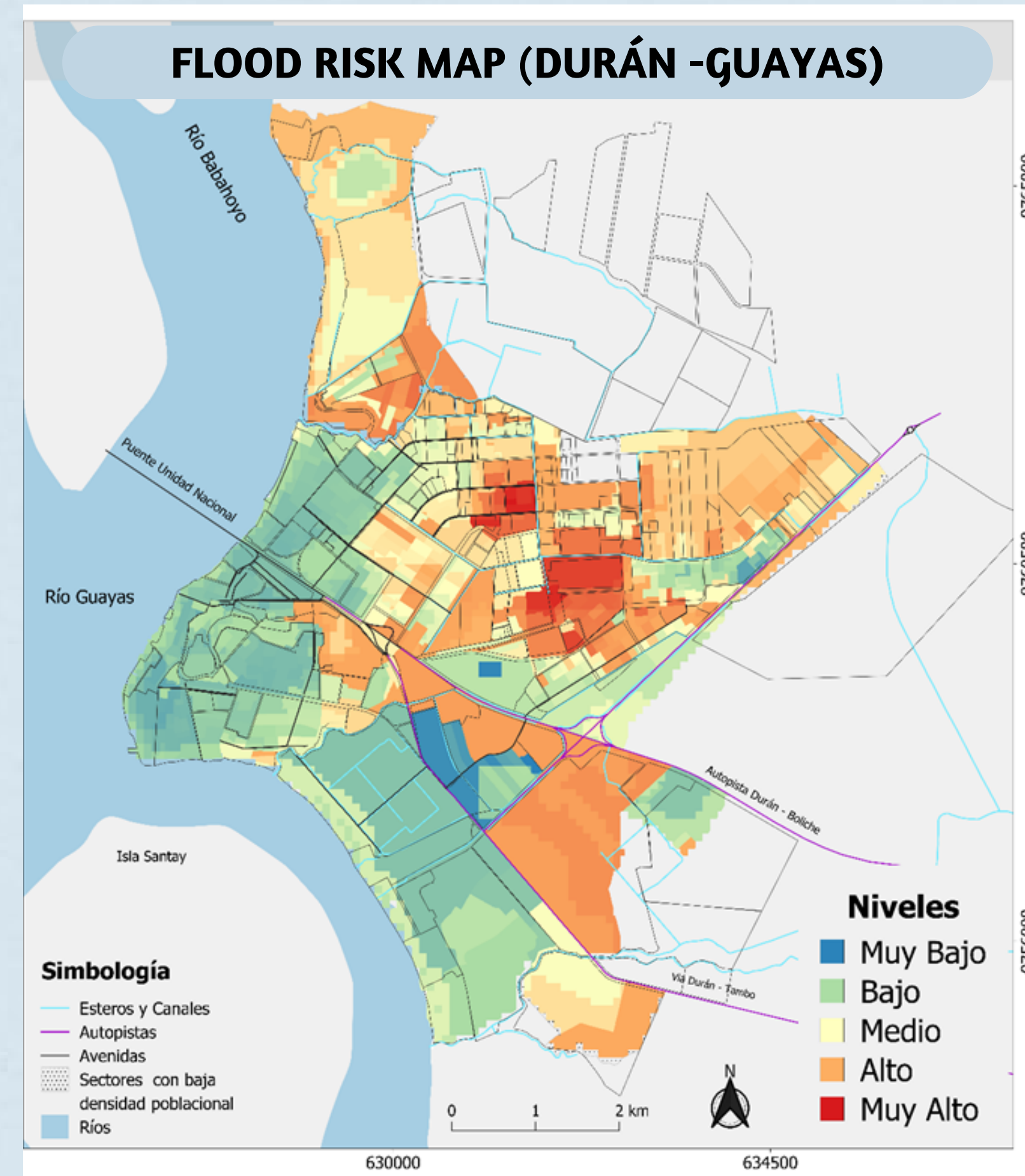
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SOCIAL-CLIMATE CONTEXT



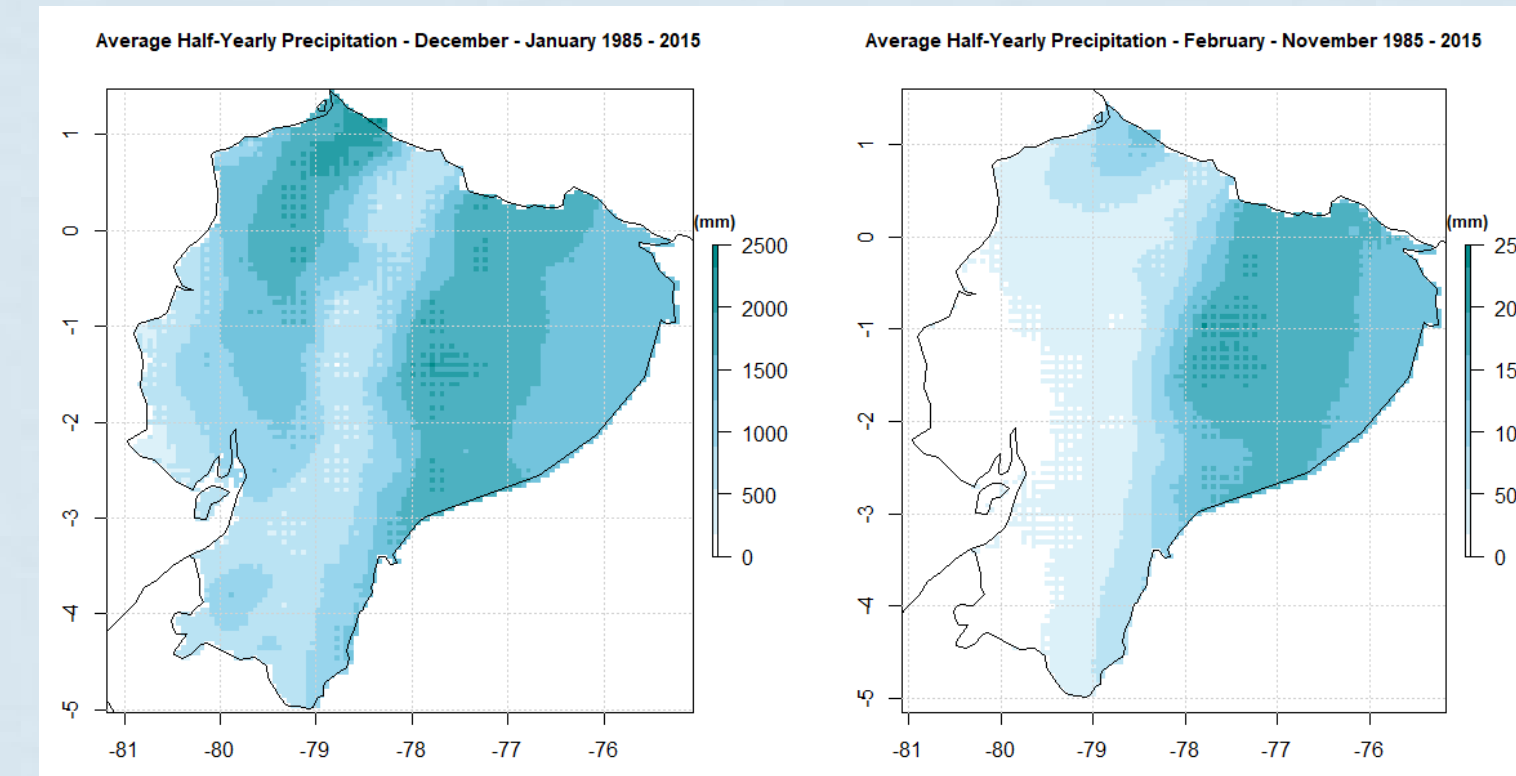
In Ecuador's coastal region, 60% of losses due to hazards correspond to floods:

- Livelihoods
- Transportation paralysis
- Business losses
- Schools affected
- Epidemics

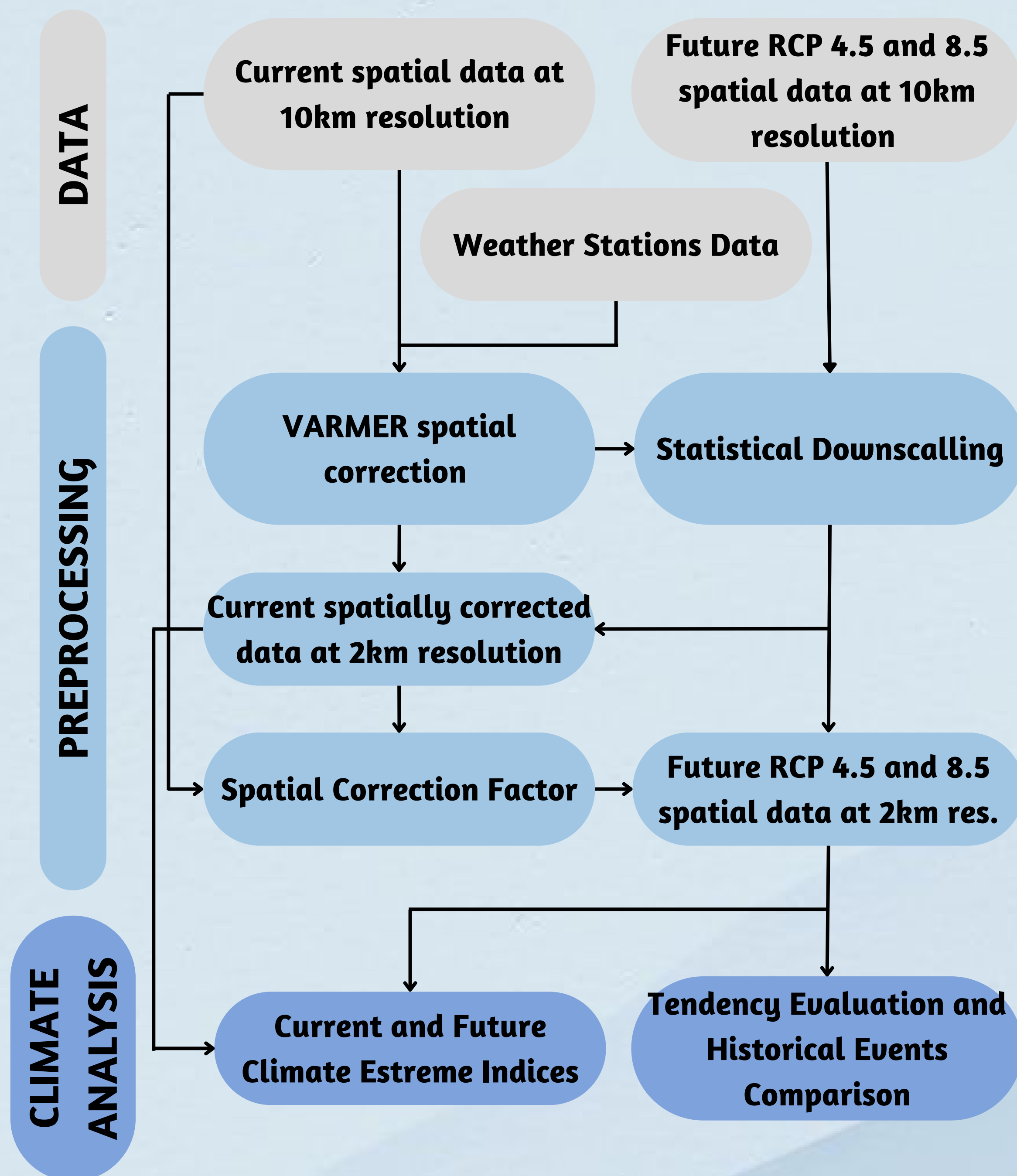


The high influence of El Niño Southern Oscillation (ENSO) and ITCZ results in an unimodal annual precipitation distribution.

75-90% of precipitation occurs between December and May
Peak rainfall in February and March



CLIMATE ANALYSIS



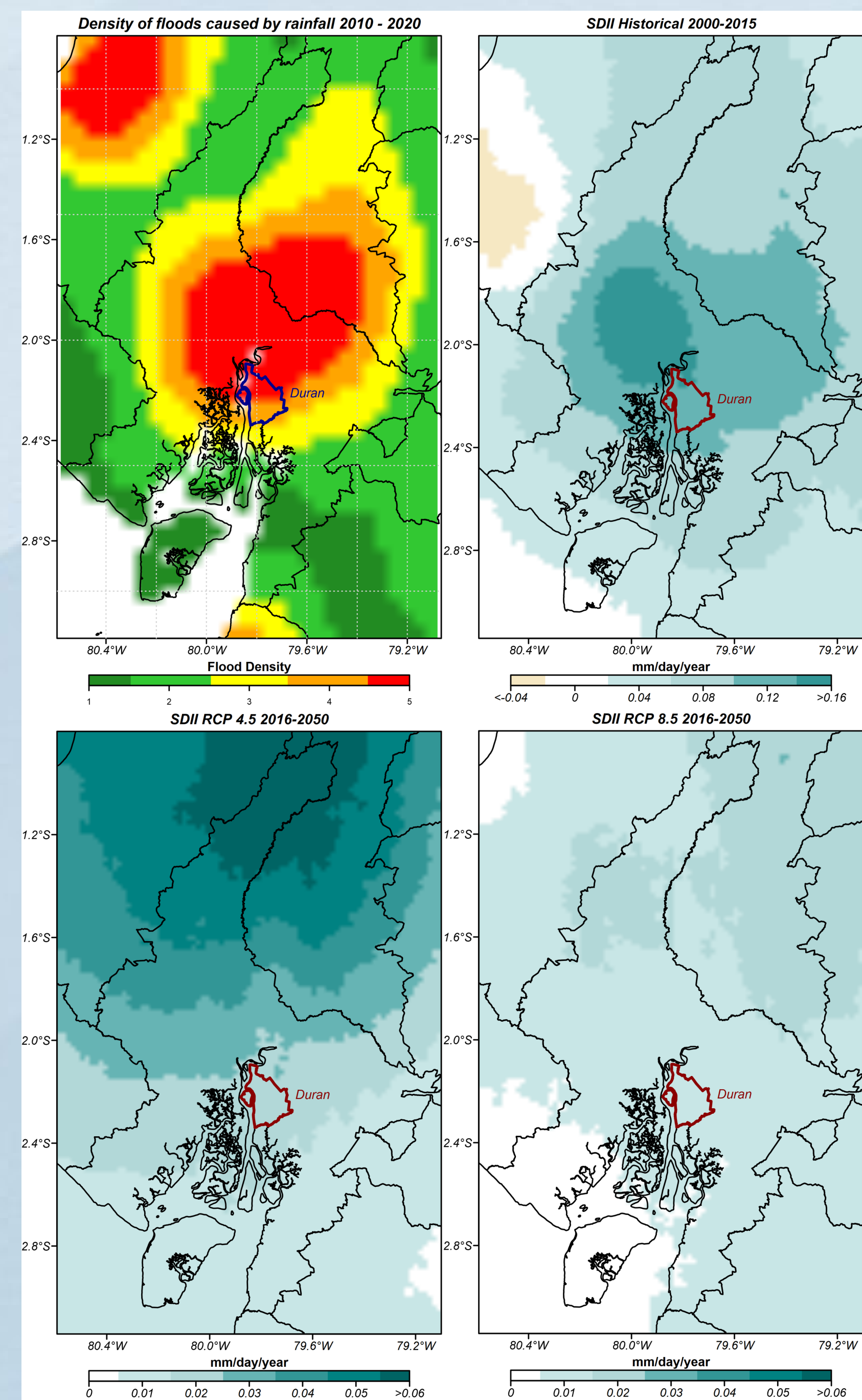
VARMER (Variational Merging) is a methodology for improving spatial raster data accuracy, which integrates meteorological station data with gridded environmental variables (Ulloa et al. 2018).

Meteorological Stations	TCN		VARMER	
	RR		RR	
	RMSE	CORR	RMSE	CORR
Milagro	12,20	0,25	8,64	0,76
Ingenio San Carlos	13,10	0,25	9,31	0,78
Nobol	9,50	0,24	6,61	0,72
Guayaquil University	11,15	0,24	7,91	0,75
Guayaquil DAC	18,83	0,15	13,75	0,69
MEAN	12,96	0,23	9,24	0,74

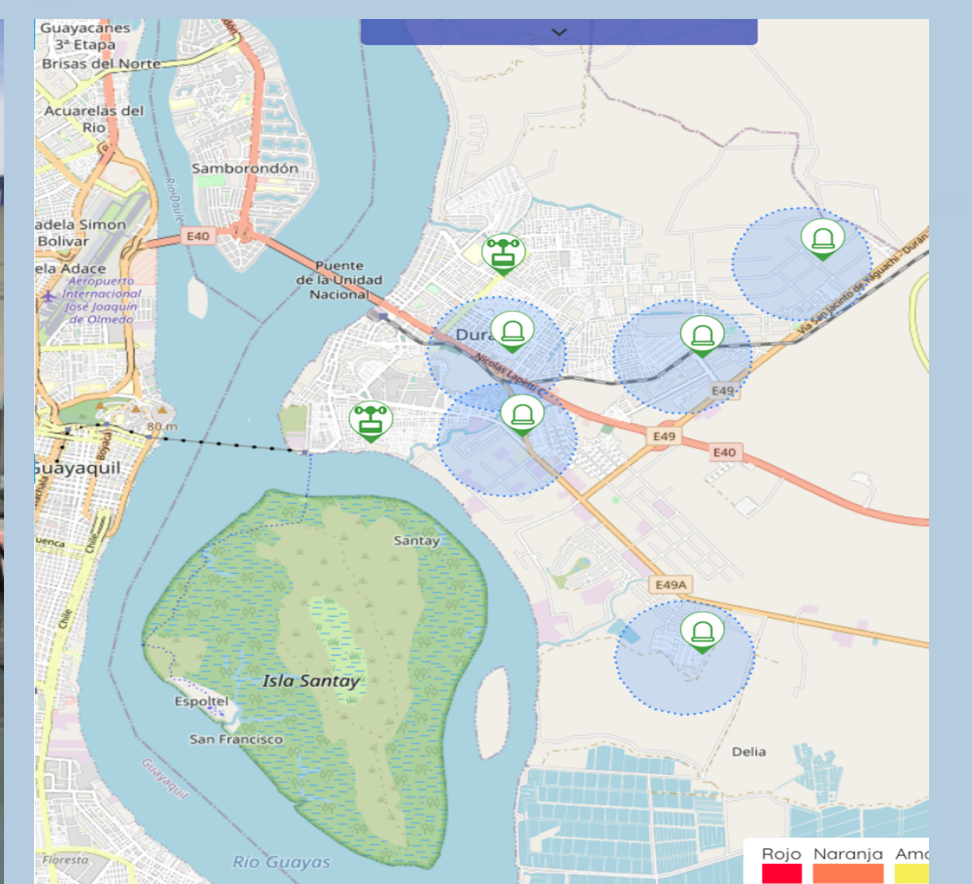
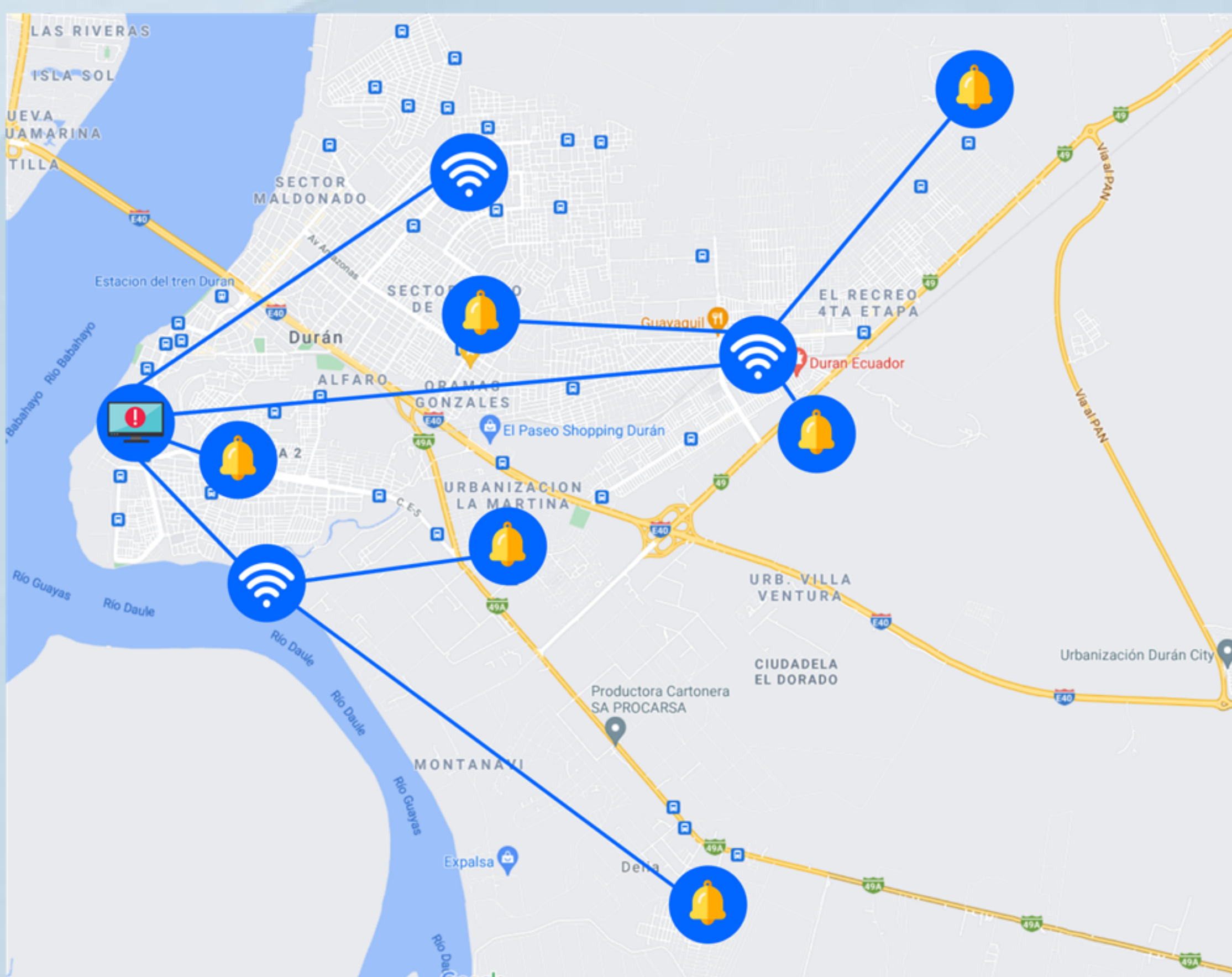
Simple precipitation intensity index (SSII)

$$SDII_j = \frac{\sum_{w=1}^W RR_{wj}}{W}$$

RR_{wj}: daily precipitation amount on wet days, w (RR ≥ 1mm) in period j. W represents the number of wet days in j:



ACTIONS TAKEN SO FAR



	Monitoring Stations (3)
	Sirens (6)
	Monitoring Center (1)



- Communication Channels through the Institutions and Community
- Community Brigades
- Preparing the community to know what to do during alerts.
- Response of local actors to reduce the impact of floods.

1. Cornejo-Rodriguez, M.P., Borbor-Cordova, M., Arias-Hidalgo, M., Matamoros-Camposano, D., Sanclemente, E., Soriano-Idrovo, G., Macias-Zambrano, J., Ochoa-Donoso, D., Dominguez-Bonini, F., Noliuos-Alvarez, I., Villafuerte-Arias, R., Menoscal-Aldas, L., Valdiviezo-Ajila, A., 2020. Diseñando Estrategias para la Resiliencia Climática en Ciudades: Informe de Políticas. CIP-RRD, Guayaquil, Ecuador. 22 págs. ISBN: 987-9942-36-967-3.
2. Ulloa, J., Samaniego, E., Campozano, L., & Ballari, D. (2018). A Variational Merging Approach to the Spatial Description of Environmental Variables. Journal of Geophysical Research: Atmospheres, 123(8), 4027-4044. <https://doi.org/10.1002/2017JD027982>
3. Ulloa, J., Samaniego, E., Campozano, L., Ballari, D., Robaina, L., & Gualan, R. (2021). Package 'VARMER'. In CRAN. <https://doi.org/10.1002/2017JD027982>