

Augmenting the spatial resolution of climate-change temperature projections: Urban planners and local decision makers for risk-informed development

**Urban Conference and Launch of Communities of Practice (CoP)
Climate-Resilient Infrastructure**

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GIZ GV Global Initiative on Disaster Risk Management (GIDRM)

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Urban planners lack data and spatial representations on maps of climate change temperature anomalies to inform decision-making at the local and urban levels

Main difficulties

- mismatches between data needs & availability
- terminology
- constraints of information technology
- maps that inform spatial planning decision-making processes

Climate change projections currently have a resolution of 10km x 10km
Land use planning represents a major limitation



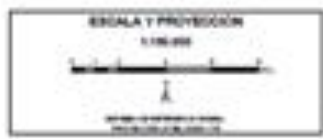
Air temperature map for January 2000 resulting from the Third Communication of Climate Change of Ecuador – water catchment area Portoviejo

Air temperature (°C)



ANOMALÍAS DE TEMPERATURA MEDIA - PROMEDIO ANUAL - CANTÓN PORTOVIEJO RCP 4.5 2071 - 2100

Layout climate change projections in 10x10km resolution in the logics of spatial planning - linking climate change projections to spatial units and water basin limits



FUENTES DE INFORMACIÓN

INIA (2010): Datos climáticos

IGM (2010): Datos topográficos

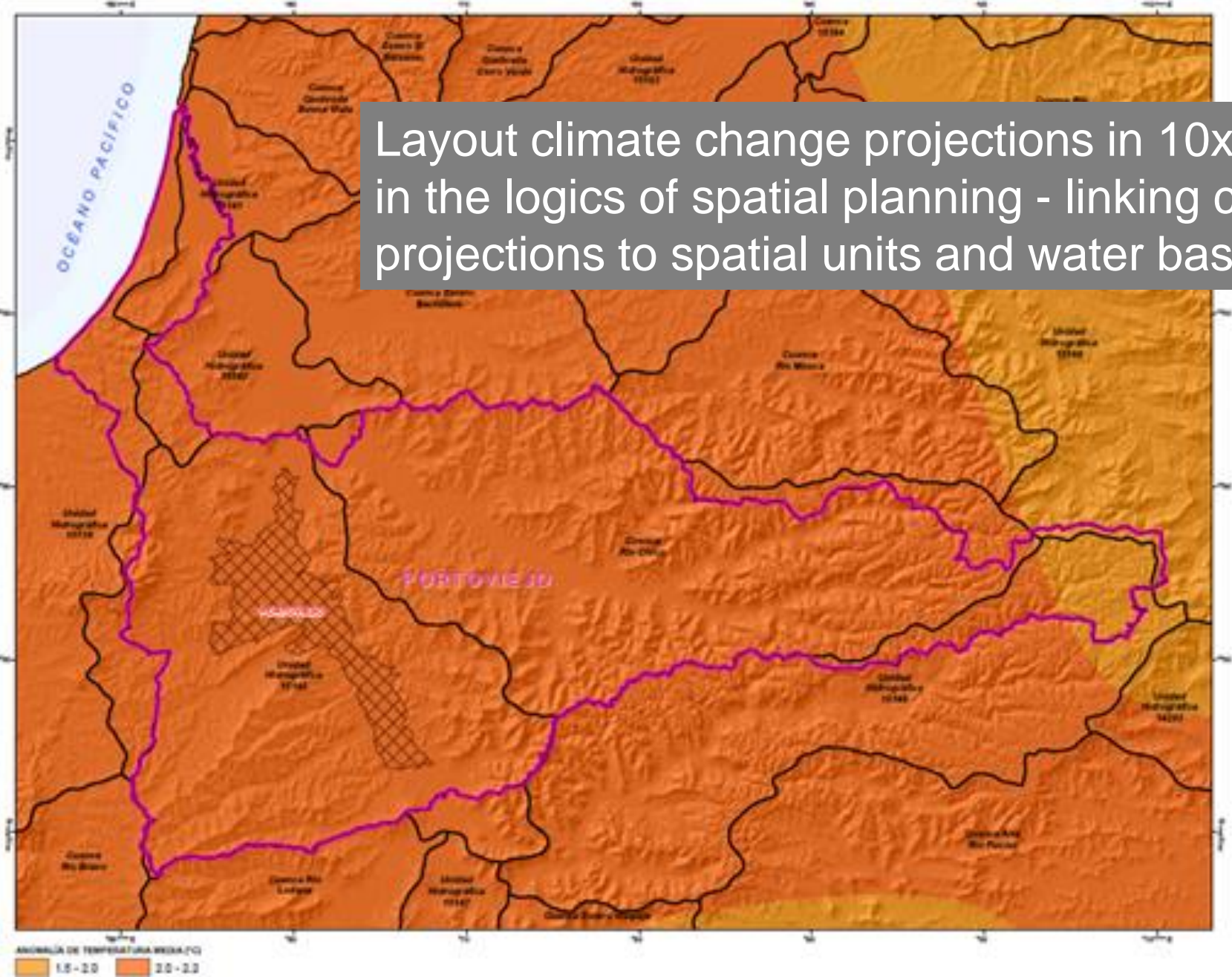
IGM (2010): Proyección de cambios de temperatura y precipitación por punto, no representativa de otros puntos

IGM (2010): Datos hidrográficos



CAMBIO DE TEMPERATURA MEDIA DEL CANTÓN PORTOVIEJO PROYECTADO CON EL ESCENARIO RCP 4.5 2071 - 2100 CON RESPECTO AL PERIODO DE REFERENCIA 1981 - 2010

Variable	Unidad	Valor
Temperatura media	°C	1.5 - 2.0
Temperatura media	°C	2.0 - 2.5



Develop a method for augmenting the resolution scale at 30 m.
We use digital elevation models and Landsat 4-7 imagery and apply S. Boltzman's law.

Jijón, J. D., Gaudry, K.-H., Constante, J., & Valencia, C. (2021). Augmenting the resolution of dynamic climate change maps for city planners and local decision makers. *Environmental Research Letters*

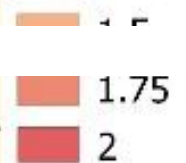




Maps have an augmented resolution of 30 m
Compatible with those of the Min. of Environment and Water
Offer a low-cost procedure for informing city officials and planners on climate change.

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- Impact on policy making and CC adaption measures at the local scale
- Synergies & challenges for DRR and CCA integration particularly for RIUD and for improving territorial governance.
- Maps can also be used on new land-use configurations, including nature-based solutions, energy demand scenarios, energy efficiency measures, etc.
- The integration of climate change adaptation as well as DRR measures are seen as an imperative for sustainable development.
- One of the main challenges relate in seeing these as separate.

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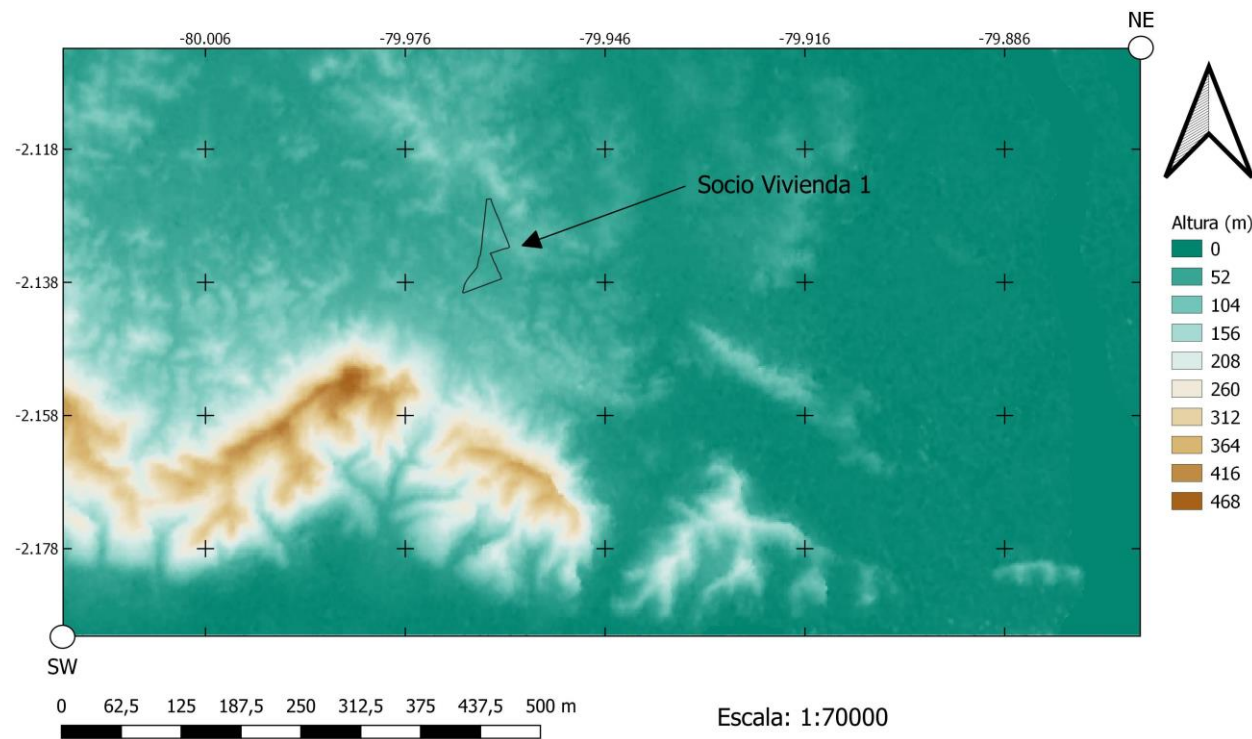
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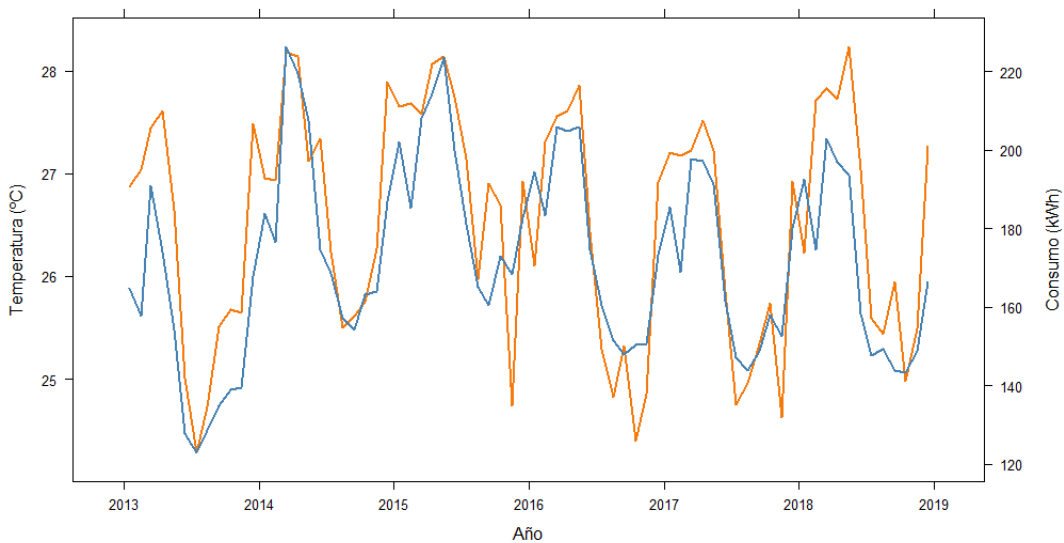




GI:DRM
Global Initiative
Disaster Risk Management

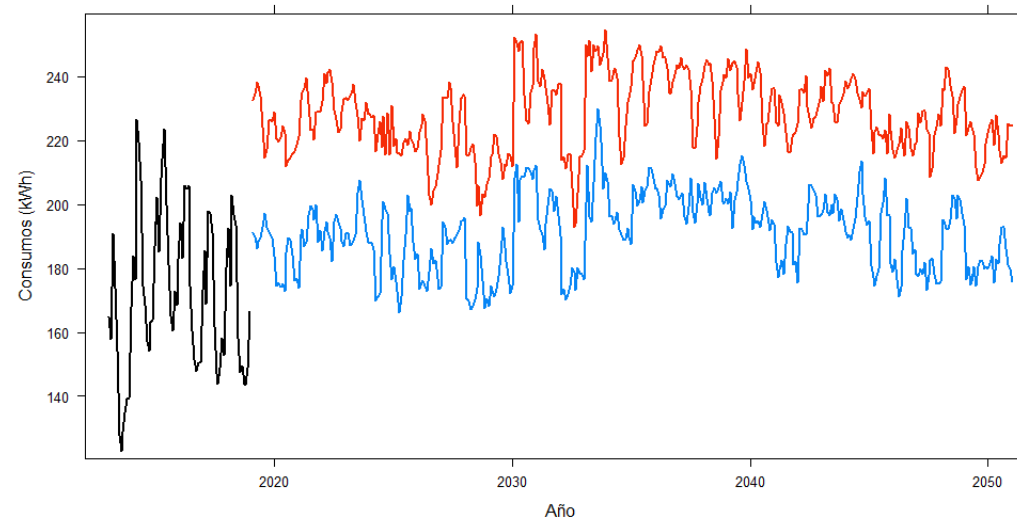
Temperatura vs Consumos

Temperatura (°C) —
Consumo (kWh) —



Proyecciones de consumos por RCP 4.5 y RCP 8.5

Consumos 2013-2018 —
Consumos RCP 4.5 —
Consumos RCP 8.5 —



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