hydrodaptive design

Adapting to sea level rise: Where to begin?

Modeling Social and Environmental Risks in urban areas

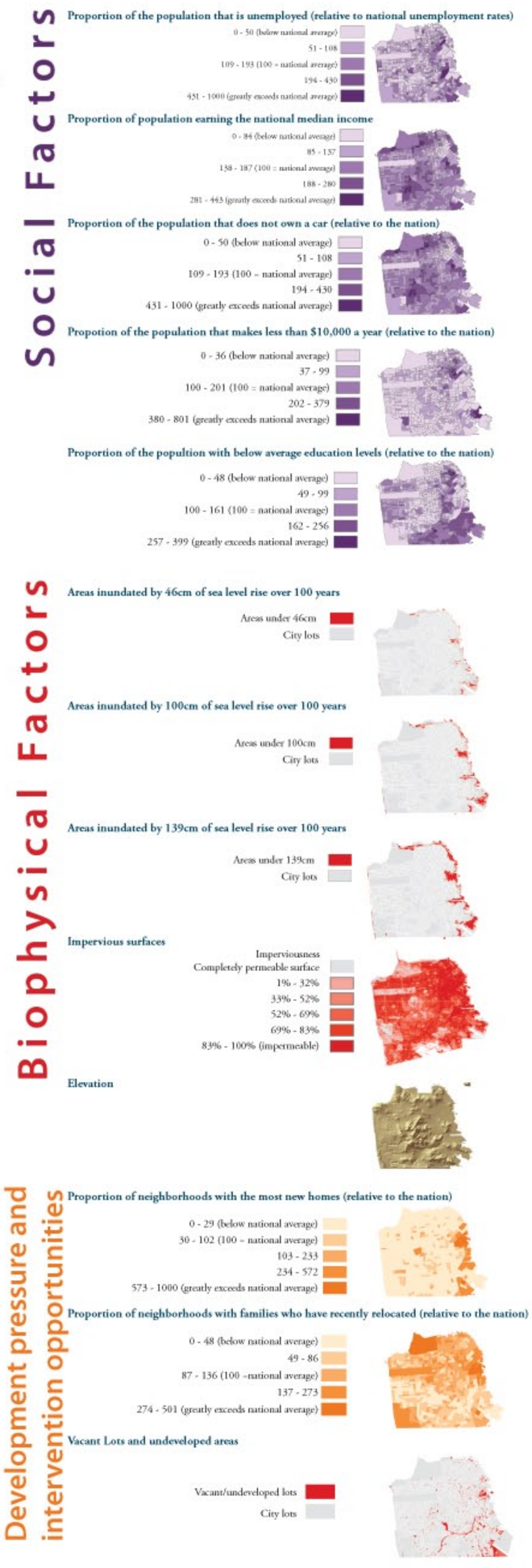
Introduction

Hydrodaptive Design is premised on the notion that urban growth and sea level rise will shape San Francisco's built environment in the future. These forces are not antithetical, and Hydroadaptive Design outlines a method for maintaining community vitality, permitting urban economic development, and preparing San Francisco's neighborhoods for sea level rise.

Methods

Our approach is informed by geographic analysis, in which we used a geographic information system (GIS) model to identify areas that are A:) threatened by sea level rise and are B:) viable sites for immediate interventions in the built environment.
In practice, the results of a risk analysis model should be published over the internet and incorporated into web-based mapping. By ranking areas according to risk and susceptibility to the social, physical, and economic impacts of sea level rise, public officials and community members can conceptualize how sea level rise will affect their neighborhoods. Accordingly, politicians and community members can work together to plan and sequence adaptation strategies.
This approach to risk analysis is scalable. The model can incorporate data form a region or it can be adapted to the physical and human geographies of other urban areas confronting sea level rise. In this proposal we focus on Mission Bay, which is subject to sea level rise, contains large amounts of undeveloped land, and is experiencing acute real estate development pressure. In this way Mission Bay is an opportunity for Hydroadaptive Design.

Data inputs:



Reclassifying and normalization

The model assesses the distribution of values within each data layer. The model then reclassifies the data into a scale from 1 – 5 in which 1 represents Low Risk and 5 represents High Risk. For example, low lying areas along the coast below 46cm will almost surely be inundated (Knowles, 2008). As such these areas receive a value of 5. Contrarily, inland areas that are above 1.39 meters will not be inundated, and therefore receive a value of 1.

Weighted Overlay

The normalized data layers are combined. Areas with the highest scores have the highest risk.

Low — Moderate — High