

twelve foot savannah

a resilience strategy for continued habitation in the savannah river estuary

TWELVE FOOT SAVANNAH DAN YOUNG LANDSCAPE ARCHITECTURE



savannah, georgia

Founded in 1733 as the colonial capital for the new British colony of Georgia, the City of Savannah is located on a promontory overlooking the Savannah River estuary. Carved out of, and therefore surrounded by, jungle, the city is hemmed by the river and swamps typical of coastal areas in the South Eastern United States.

Growth of the city has pushed human habitation across the border demarcated by the waters edge, resulting in an urban setting highly prone to periodic flooding. Furthermore, rising sea levels in the next forty years create a new policy of resilient human habitation, where urban expansion & densification occurs in a fashion responsive to a new landscape.

This landscape is governed by the river, and by the 100 year flood level - 12 feet. This level provides not only a new boundary, but also an opportunity to develop a strategy that treats the boundary as a resilient edge, providing multiple functions throughout its transition.

It is this strategy of transition that defines **twelve foot savannah.**



savannah squares & grid arrangement

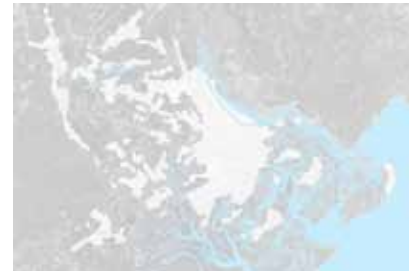
savannah squares

the foundation of the city

Savannah is well known for its city squares - twenty-two green spaces located at regular intervals in the heart of the city.

Laid out in anticipation of future expansion, the squares provide important social, recreational and cultural benefits to the residents of Savannah, as well as to the tourists that visit purely to visit the squares.

The grid generator is employed as a design device for the broad-scale 'twelve foot Savannah' proposal, providing a connected structure on which future development will take place.



existing urban footprint & estuary proximity

urban footprint

patterns of habitation

While a large proportion of Savannah's urban areas are located on high ground and ridges overlooking the river, urban expansion has pushed more recent development into lower lying regions.

These areas are at the greatest risk of flooding when the Savannah river breaches its banks, while older, more established areas sit clear of the inundation zone.



urban footprint

key infrastructure

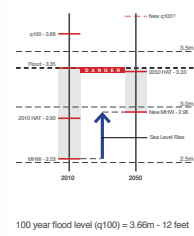
tracking the high ground

The majority of Savannah's transport and arterial infrastructure is located within, or serves to connect current established urban centres.

Infrastructure corridors in Savannah are typically located on higher ground that surrounding urban areas, allowing key services to continue operating in times of flooding.

habitation, river & vegetation

climate change & flooding



100 year flood level (q100) = 3.69m - 12 feet

Median High Water (MHW) = 2.53m

Savannah River is a semi-diurnal tidal river with an average tidal range of 2.56m

Highest Astronomical Tide (HAT) = 2.90m

This is 0.37m above current MHW

Savannah River reaches official flood stage at 3.35m (11 feet)

High-end estimate by Intergovernmental Panel on Climate Change (IPCC) for sea level rise by 2050 = 0.43m

Adding this estimate to the current median high water level calculates a new MHW:

2.53 + 0.43m = 2.96m

Addition of the current difference between MHW and HAT achieves an estimate of expected HAT for 2050:

2.96 + 0.37m = 3.33m

2050 HAT will come within 3cm of current flood stage, and within 33cm of existing q100 levels.

Thus, a strategy for resilient expansion in the Savannah region responds not only to the threat of rising sea levels, but also to the effects of periodic flooding.

extent of q100 flood event



q100 flood event overlaid on urban footprint



inundation area - below q100 level

flood inundation

inundated land is uninhabitable land

Low lying areas surrounding Savannah are under constant threat of inundation by flood waters.

Tracking the extent of flood waters on low-lying territories provides the foundation of a strategy for resilient development in the face of climate change and intermittent flooding.



defensible land - above q100 level

defensible territories

defensible land is habitable land

High territory clear of identified inundation areas forms the backbone of the twelve foot Savannah strategy.

Pockets of undeveloped high ground still exist above the q100 inundation line, providing opportunities for resilient future development.



urban overlay and defensible territories

speculative proposal - twelve foot savannah



stage 2 stage 6 stage 3 stage 4 stage 5

threatened land

threatened land dictates a resilient proposal

Mapping locations at threat of inundation allows key services to be identified and prepared for relocation.

Dark blue regions represent existing urban areas currently located below the q100 inundation line, indicating that key services, infrastructure and residential communities must be relocated from these locations as part of the proposal.

resilience opportunities

resilient locations inform future development

Light green areas represent areas clear of the q100 inundation line yet to be urbanised, indicating locations for resilient urban expansion.

Establishing a matrix of defensible territories necessitates the construction of land bridges on high ground to link current (dark grey) and future (dark green) urban areas.



Bridging corridors

stage 1 - connections

Identify connections & establish land bridges

Locations for corridor expansion are identified based on urban connectivity and proximity to existing infrastructure.

Land bridges are constructed between existing and newly identified urban footprint areas to form the framework of a new habitable footprint.



Savannah Necklaces

stage 2 - savannah necklaces

develop necklace parts on urban fringes

'Savannah Necklaces' form a protective barrier, allowing for staged consolidation of infrastructure into defensible territories.

Necklaces also provide recreational opportunities close to urban areas, as well as alternative connection routes between urban districts.



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stage 3 - new savannah squares
establish a grid of new squares and parks

Based on the twenty-two historic city squares, New Savannah Squares provide recreational and productive opportunities for nearby residents. Squares are responsive to existing site conditions and a site-specific intervention, with the extent and ultimate use of each square conditional upon its immediate surrounds.



New Savannah Squares



stage 4 - grid connections
connect the necklaces and new squares

Working with the expanded Savannah grid overlay and existing transport infrastructure, additional green linkages are established to increase internal connectivity within a network of new recreational and productive squares.



Green Space Connection



stage 5 - response
a resilient approach to rising water levels

The edge condition of the Savannah Necklace is altered due to the rise in sea level, with these areas now displaying a predominantly riparian character. Circulation that once took place along the necklace now shifts inwards towards higher, defensible ground.



External pressure



stage 6 - twelve foot savannah
celebrating a resilient urban condition

Twelve foot Savannah has accepted the challenges of climate change and developed a climate responsive urban typology. Internal low-lying areas are sequestered for aquaculture or water supply, while agricultural production shifts to locations inside the New Savannah Squares. Twelve foot Savannah is defined by transient edges of the necklaces, intensified occupation of defensible territories and increased recreational activity within the urban core.

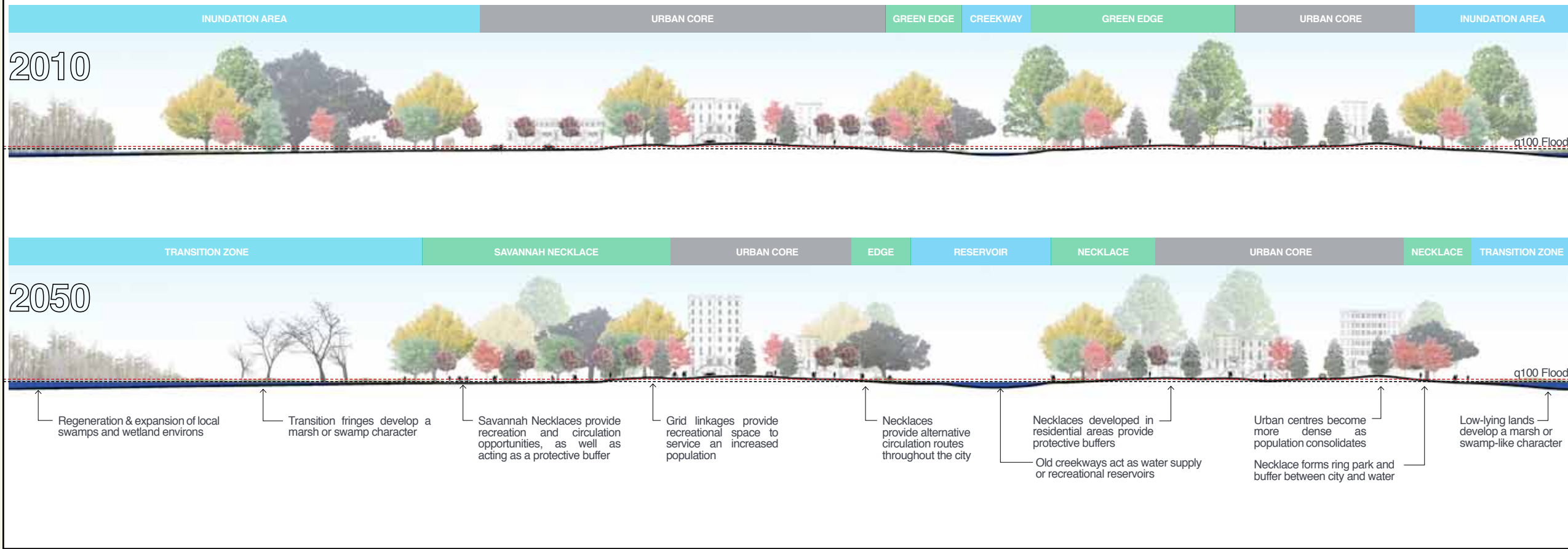


Water as a city feature



twelve foot savannah

twelve foot savannah describes a densified urban core, sited clear of the q100 inundation line and providing a framework for a resilient city. Savannah Necklaces border the transition zones on the fringe of the city, creating a fluid defensive edge as well as an expanded recreation and circulation corridor. Grid Linkages connect through the interior of the urban fabric, allowing for unrestricted access even in times of flooding.



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