Kingston & St. Andrew EbA Profiles

Name: Luke Buchanan

EbA - Ecosytem based adaptation

- Use of biodiversity and ecosystem services to help people adapt to the effects of climate change.
- Ecosystem services:
  - provide potable water, food, medicine etc
  - regulating services which control our climate, disease vectors, crop pests, pollinators
  - cultural services that influence our beliefs, traditions

- Main impacts of Climate Change in cities:
  - Heat waves, doughts, storms etc
  - Flooding (coastal and inland)
  - Water scarcity
  - Increase and spread of tropical diseases

- The aim of this project acitivity is to reduce the vulnerability of urban communities through ecosystem-based adaptation options

Datasets

DATA	SOURCE
POPULATION & DERIVATIVES	STATIN
BUILDING LOCATIONS	MGI

DATA	SOURCE
WATER QUALITY	WRA
FACTORY LOCATIONS	MGI - JAMNAV

DATA	SOURCE
POVERTY	PIOJ
EMPLOYMENT	MIN LABOUR

DATA	SOURCE
POIs	MGI

DATA	SOURCE
ROADS	MGI-JAMNAV
WATER PIPELINES	NWC
WELLS	WRA
SEWAGE LINES	NWC

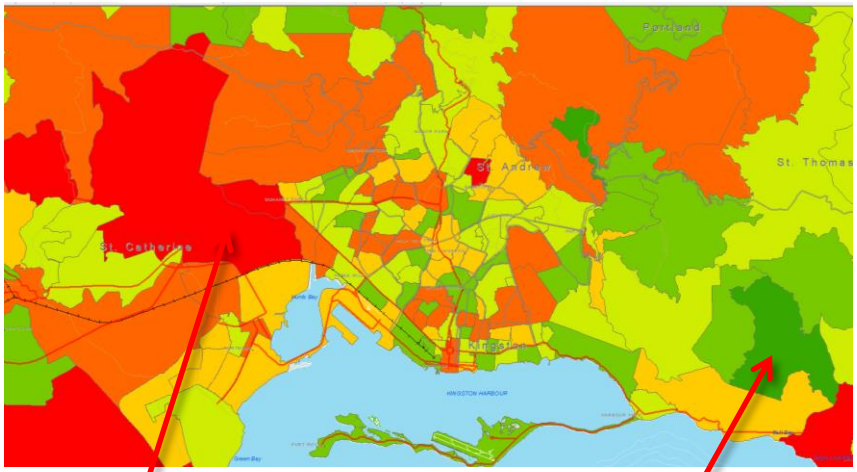
DATA	SOURCE
GULLIES	NWA
GULLY FEEDER AREA	MGI
FLOODS	MGI
COASTAL TYPOLOGIES	MGI

City Growth

COMMENTARY:

Pattern of growth has been to the west of Kingston. Increased pattern of high density developments (residential and commercial), with greater intensity of activities. Kingston has shown depopulation in certain communities within the metropolitan area, but some efforts and regentrification and redevelopments have slowed declines in other areas, including growth in some. Pattern of encroachment on surrounding hills of city.

Population Change

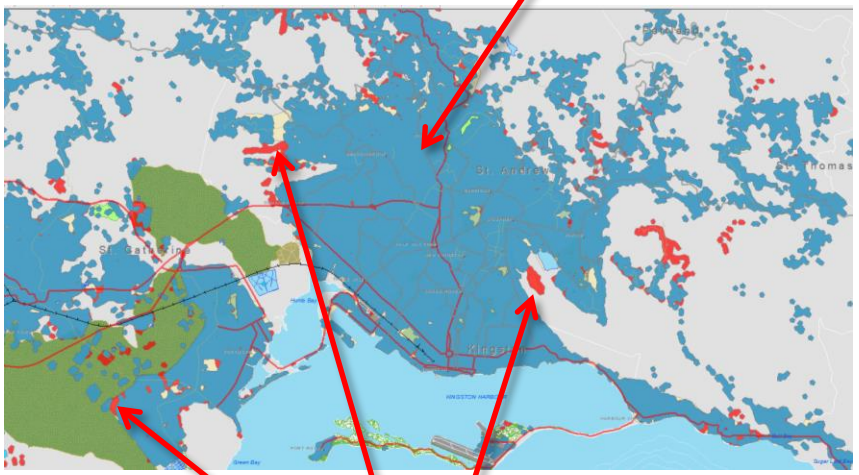


>50% +'ve change

>50% -'ve change

Building Change – 2001-2016

Building pattern - 2001



New building clusters - 2016

CITY GROWTH METRICS

POPULATION 2001	648,878
POPULATION 2011	661,473
GREATEST % INCREASE IN POPULATION	•ARCADIA •RED HILLS •FOREST HILLS
GREATEST % DECREASE IN POPULATION	•UNIVERSITY •RAE TOWN •KINTYRE
BUILDINGS – 2001	89,300
BUILDINGS - 2016	93,145
GREATEST % INCREASE IN BUILDINGS	•DALLAS •MARYLAND •GOLDEN SPRING

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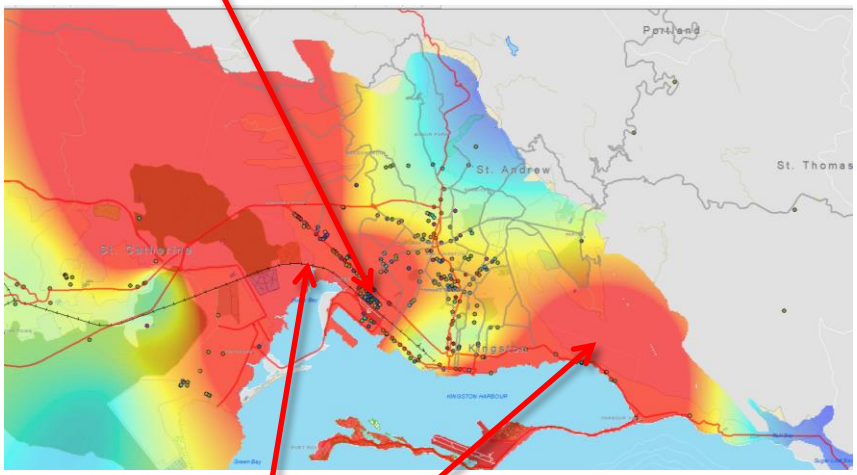
Water Quality Impacts

COMMENTARY:

High groundwater pollution in areas with dense populations, high industrial activities and little or no sewerage service. Of note, regulations more tightly govern industrial effluent discharge. Use of treated wastewater effluent is also being proposed to provide artificial recharge and flushing of the aquifer. Most of urban area sits on quaternary alluvium aquifer.

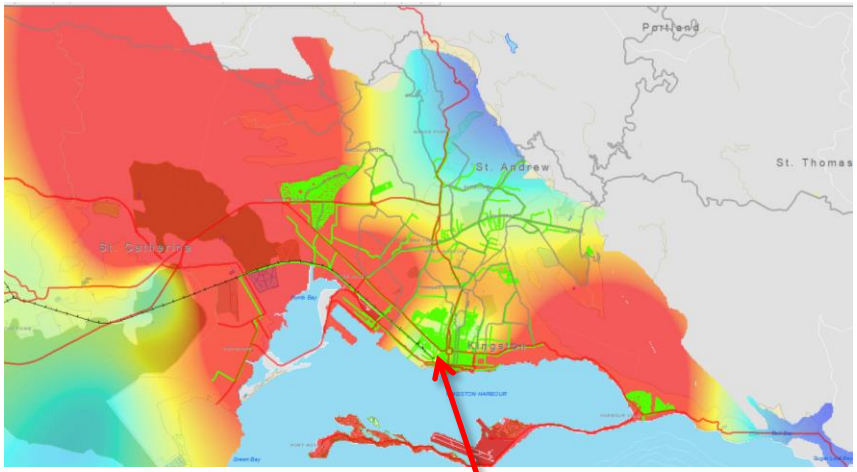
Nitrates and Factories

Factory locations – all categories



High nitrate concentrations in groundwater

Nitrates and Sewage Lines



Sewer lines

WATER QUALITY: COMMUNITY METRICS

COMMUNITIES WITH HIGHEST NITRATE CONCENTRATIONS	•RIVERTON •FERRY •NEW HAVEN •COOREVILLE GARDENS •SEAVIEW GARDENS
COMMUNITIES WITH HIGHEST POPULATION DENSITY: DISTANCE TO SEWAGE LINE RATIO	•ROCKFORT •BEVERLY HILLS •BULL BAY •HOPE PASTURES •AUGUST TOWN

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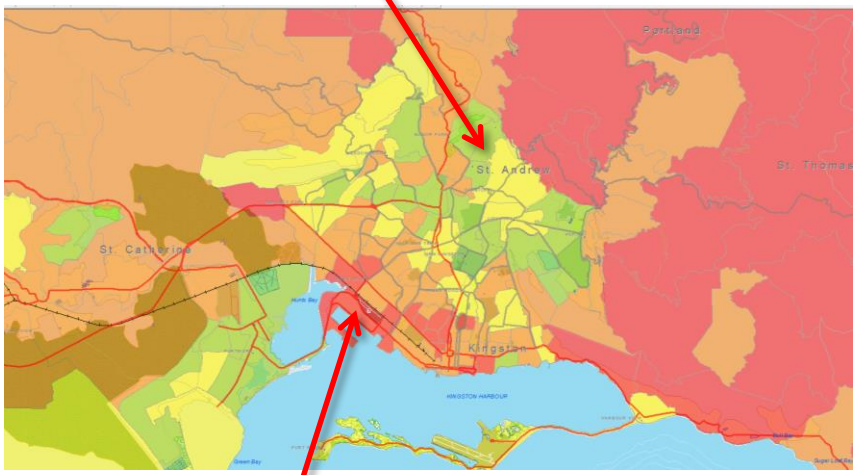
Vulnerable People

COMMENTARY:
Uneven distribution of vulnerable people, with correlation between poverty and employment levels; there is also a relationship with educational attainment.

Poverty

<1% of population below poverty line



Over 25% of population below poverty line

Employment

>10% of population unemployed

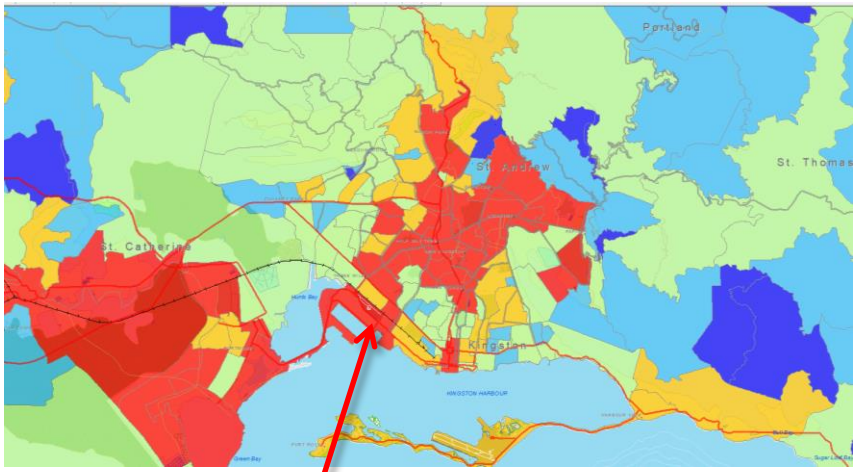
<2.5% of population unemployed

Vulnerable Places

COMMENTARY:

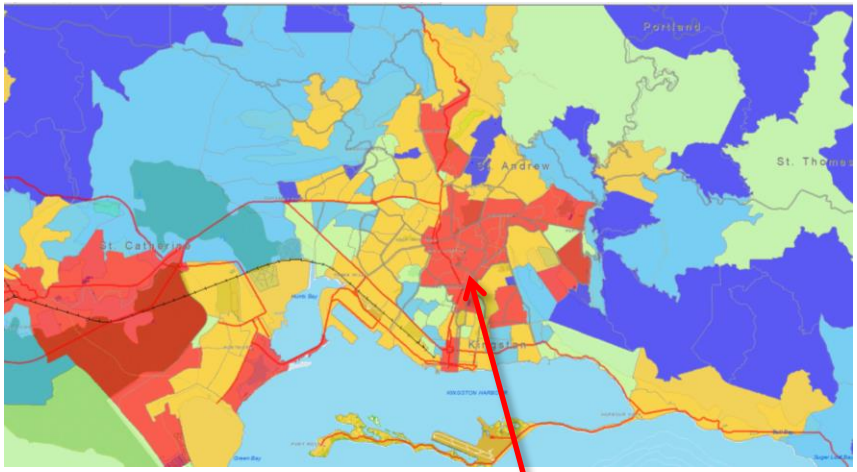
POI concentrations mainly in CBDs, OBDs and along critical corridors. CBDs have greatest concentrations of wide ranges of POI categories. Industrial (and educational areas) have high numbers but low category diversities.

POI Count



Number of POIs

POI Diversity



Number of different POI categories

VULNERABLE PEOPLE AND PLACES METRICS

COMMUNITIES WITH HIGHEST POVERTY	•MAJESTY GARDENS •SOUTHSIDE •ROSE TOWN •DENHAM TOWN •REMA
COMMUNITIES WITH HIGHEST UNEMPLOYMENT	•DELACREE PARK •PENWOOD •TIVOLI GARDENS •GRANTS PEN •JONES TOWN
COMMUNITIES WITH HIGHEST POI COUNT	•HWT •NEW KINGSTON •UNIVERSITY •CROSS ROADS •CENTRAL DOWNTOWN
COMMUNITIES WITH HIGHEST POI CATEGORY DIVERSITY	•HWT •NEW KINGSTON •LIGUANEA •CROSS ROADS •CONSTANT SPRING

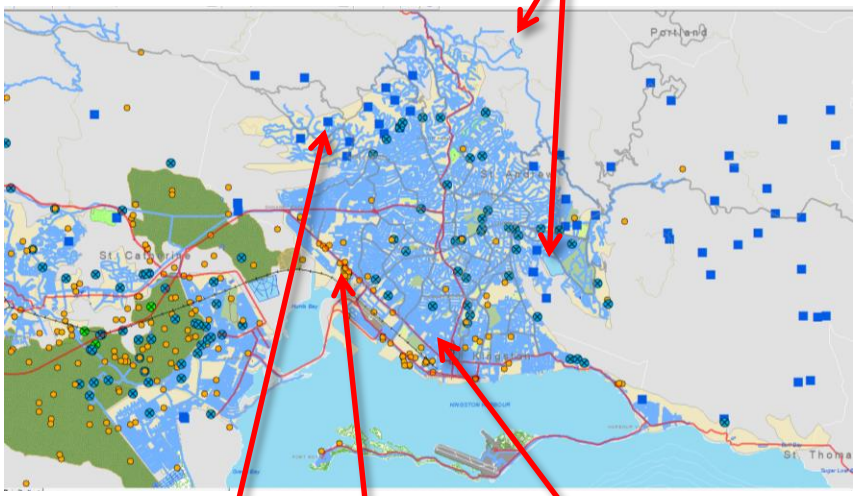
INFRASTRUCTURE

COMMENTARY:

Major transportation corridors and critical facilities lie along coastal zone, including only major artery to eastern Jamaica. KSA has fairly diverse sources of water, including piped water from outside the city, though some of these are from surface water systems prone to drought impacts. This is augmented by water from different well sources, and supported by a network of community storage tanks and two large reservoirs. There are challenges, however, with the efficiency of the delivery of water city-wide, with leakage and theft.

TRANSPORT

WATER SUPPLY



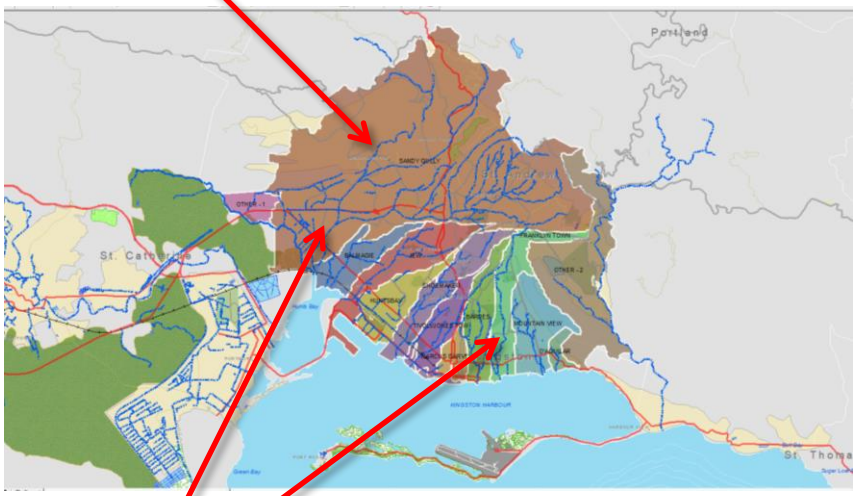
DRAINAGE AND FLOODING

COMMENTARY:

Gully networks are channelized from natural drainage lines for the KSA. Most historical floods in the city are the result of blocked drains, or where an event exceeded the capacity of the drainage network to remove the water. In some cases, areas are affected by upstream runoff, which may have higher amounts and velocities owing to increased development. Downstream drainage have not been upgraded to handle increased flows. Localized cleanup efforts are common, but do not address systemic issues.

GULLY NETWORK

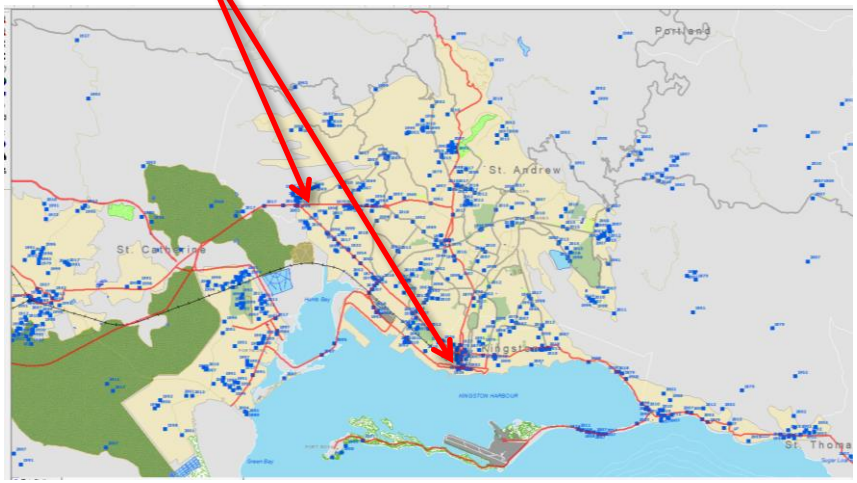
Gully catchment area



Gully

FLOODS

Historical floods

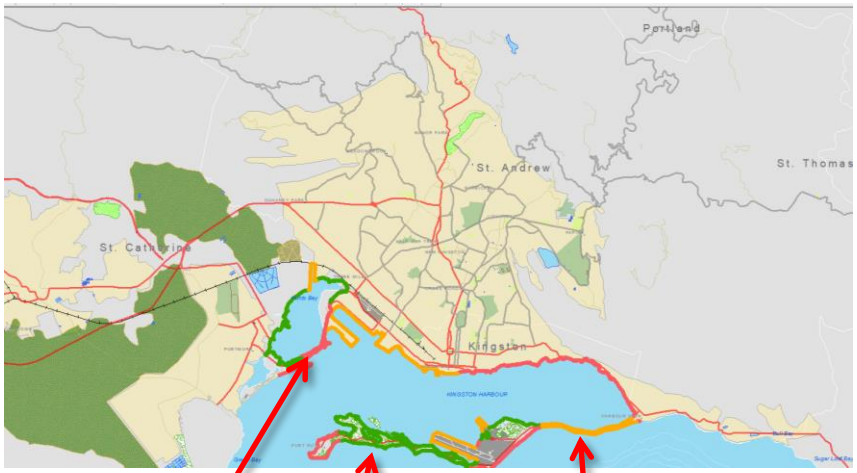


Coastal City

COMMENTARY:

Coastline has three main types – natural mangroves, gravelly beaches, and engineered coastlines (reclaimed structures for airport runway, port berths, city waterfront and revetment works). Coastal flooding extents vary according to city topography, with furthest inland extents to the west, extending over 8km inland in some places.

Coastline Types

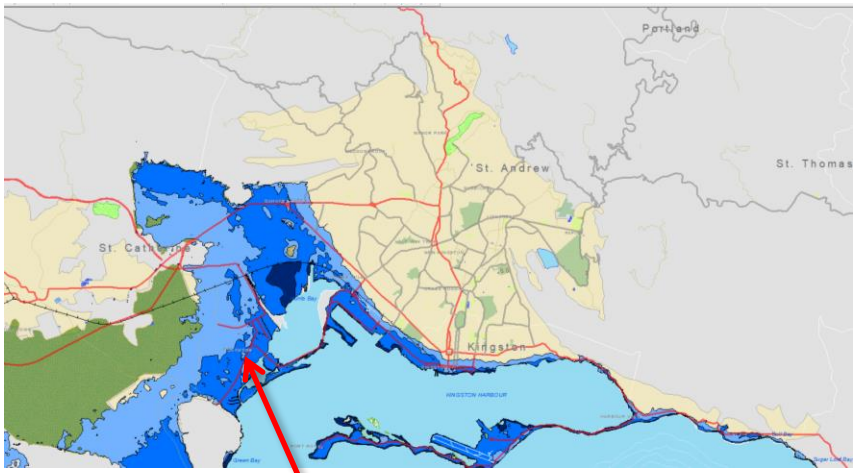


Beach

Mangroves

Engineered coastline

Coastal Flooding



Coastal flooding extent – 0-5 to 10m

FLOODING METRICS

COMMUNITIES MOST VULNERABLE TO COASTAL FLOODING (BY AREA)	•SEAVIEW GARDENS •SOUTHSIDE •NEW HAVEN •RIVERTON •COOREVILLE GARDENS
COMMUNITIES WITH MOST OVERALL FLOOD OCCURRENCES (1834-2019)	•CENTRAL DOWNTOWN •NEW HAVEN •HARBOUR VIEW •PORT ROYAL •CONSTANT SPRING

FLOODS, BY DECADE