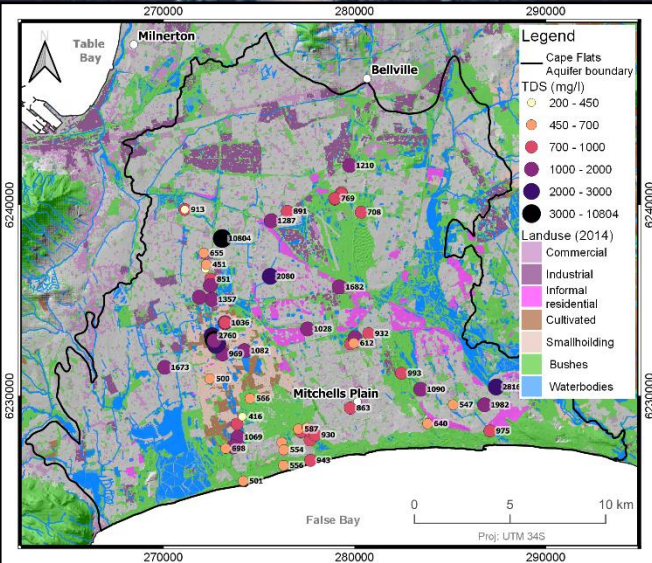
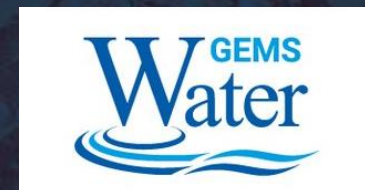


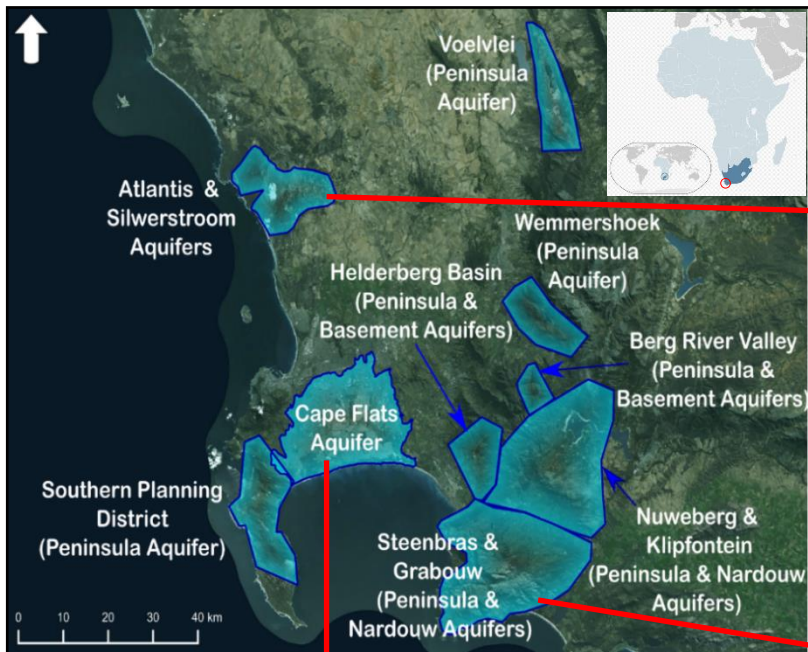
Cape Town's Major Aquifer Systems as a Use Case Study for the Global Water Quality Assessment



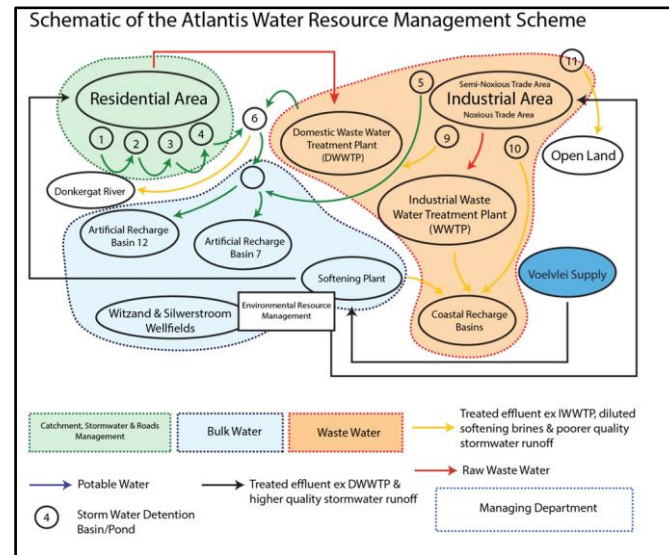
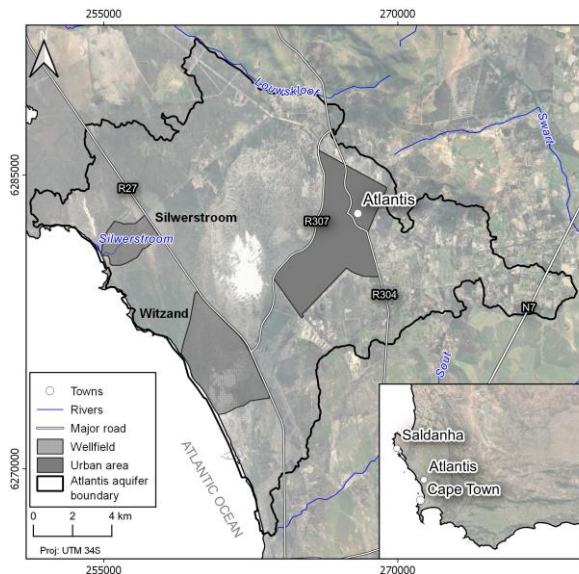
Kornelius Riemann, Dylan Blake,
Rowena Hay, David McGibbon, Luke
Towers, Andrew Gemmell



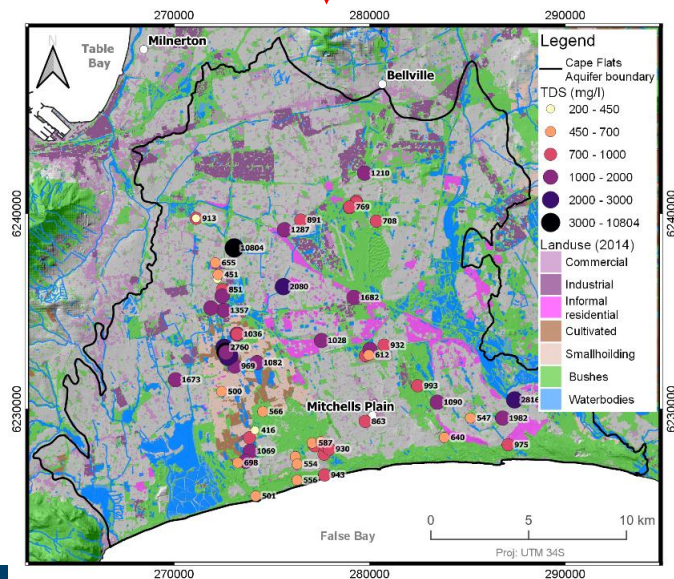
CAPE TOWN MAJOR AQUIFER SYSTEMS USE CASE



Atlantis Aquifer – Hardness, Fe-Biofouling, Stormwater



TMG Aquifers (Peninsula/Nardouw) – Acidity, Elevated Fe/Mn

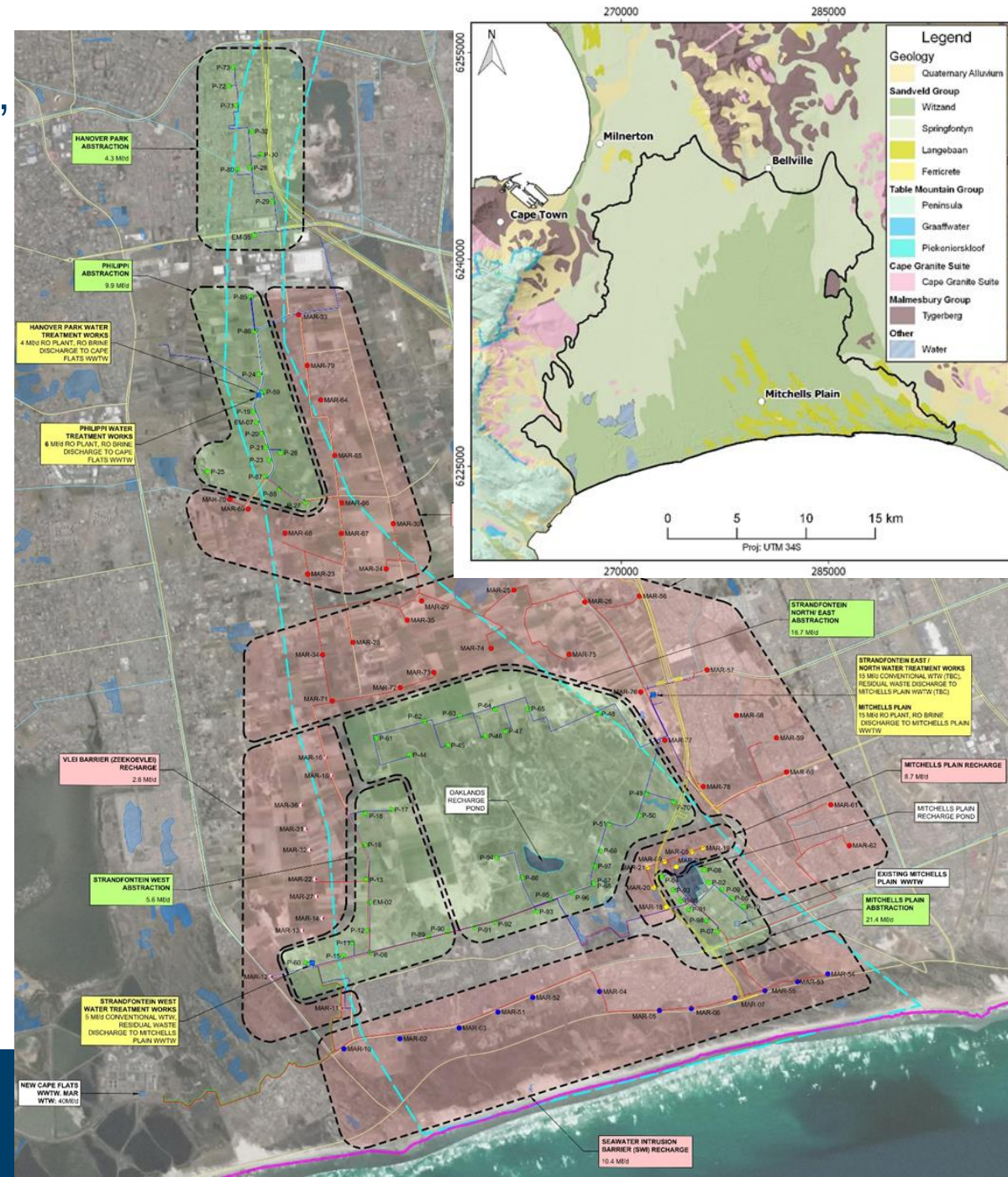
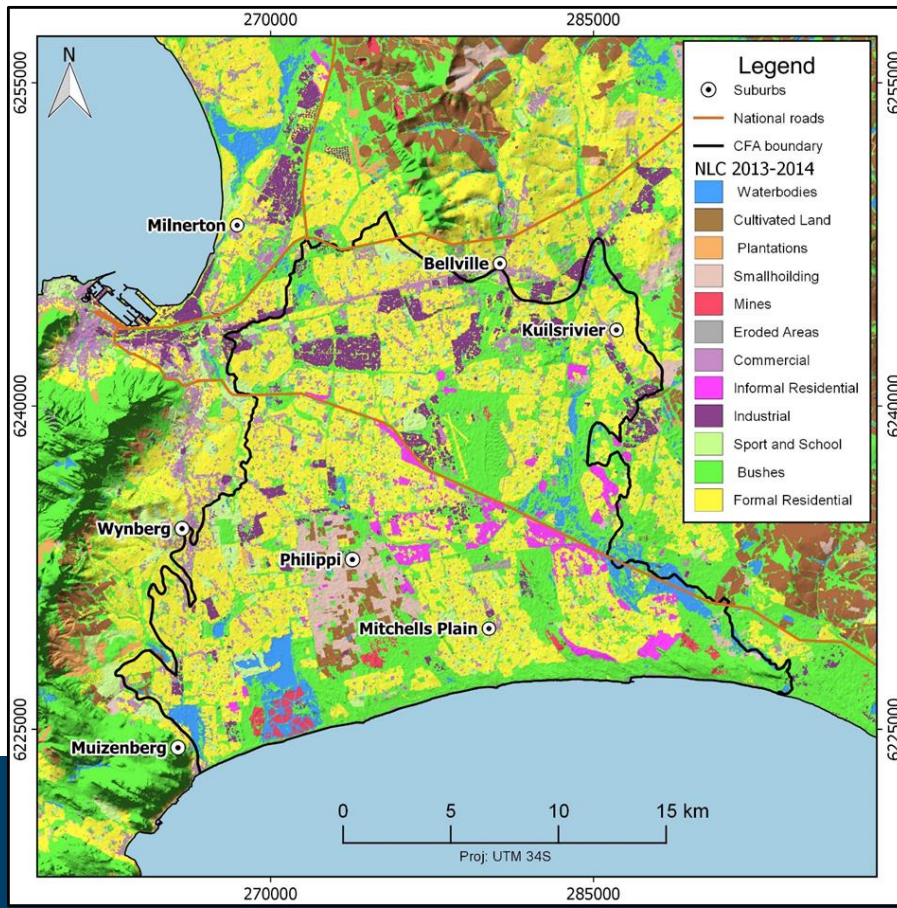


Cape Flats Aquifer – Urban Contamination



CAPE FLATS AQUIFER – CONTEXTUALISATION

- Sedimentary aquifer in urban setting, prone to pollution
- Intensively used for irrigation in agricultural area
- Groundwater scheme development by City of Cape Town

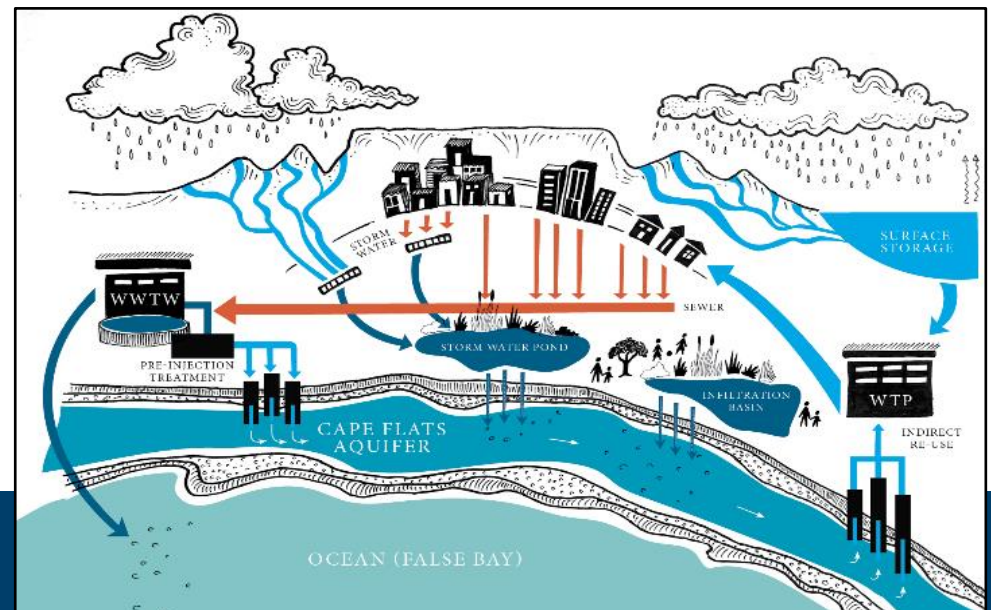
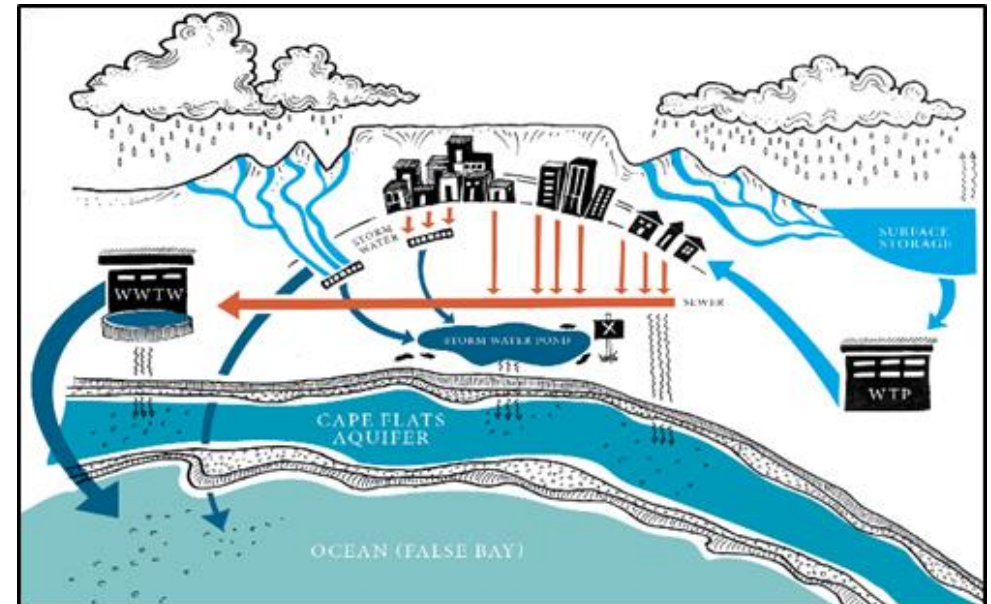


CAPE FLATS AQUIFER – STAKEHOLDERS

Engagement Process

- Formal
 - City of Cape Town officials (regularly)
 - Project engineers (monthly)
 - Environmental Monitoring Committee (bi-annual)
- Other Stakeholders
 - Farmers Forum
 - Landowners
- Communities
 - Informal while on site
 - Stewardship Initiative

Vision: Water Sensitive City by 2040



CAPE FLATS AQUIFER – WQ ASSESSMENT

Methodology – The Triangle

In-situ measurements

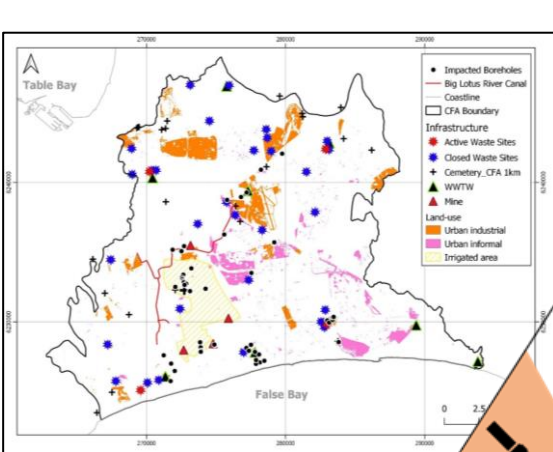
- Routine, regular monitoring
- Ad-hoc measurements



In-situ monitoring data

Products and Services

- Data repository
- Hotspot identification
- Aquifer protection zones
- Water stewardship



Remote sensing data

Remote Sensing

- Landuse mapping
- Potential contamination

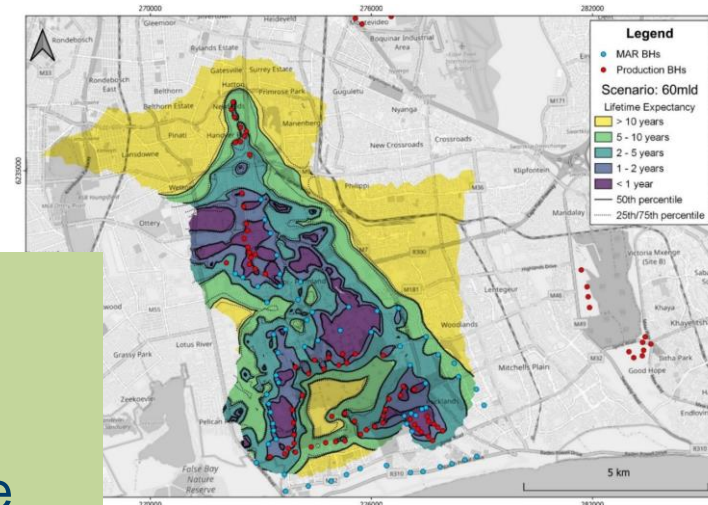
Baseline
Status Quo
scenarios

Participatory
management options

Modelling data

Predictive modelling

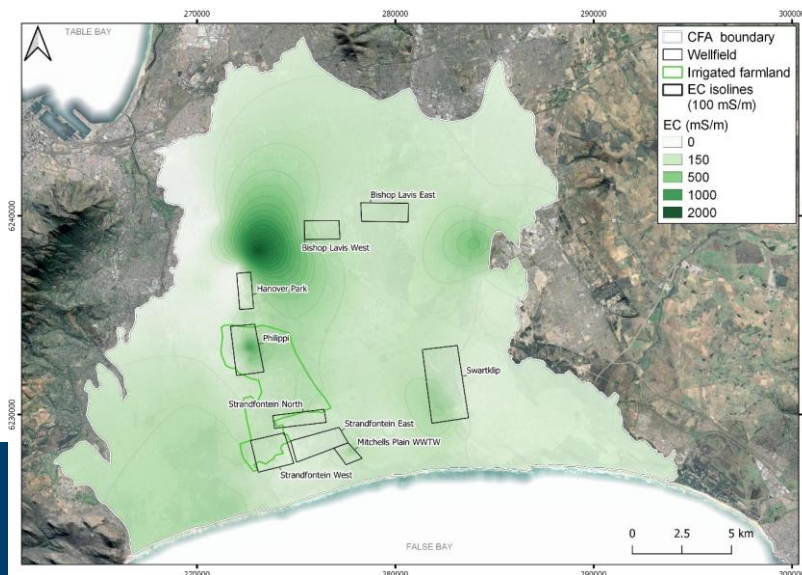
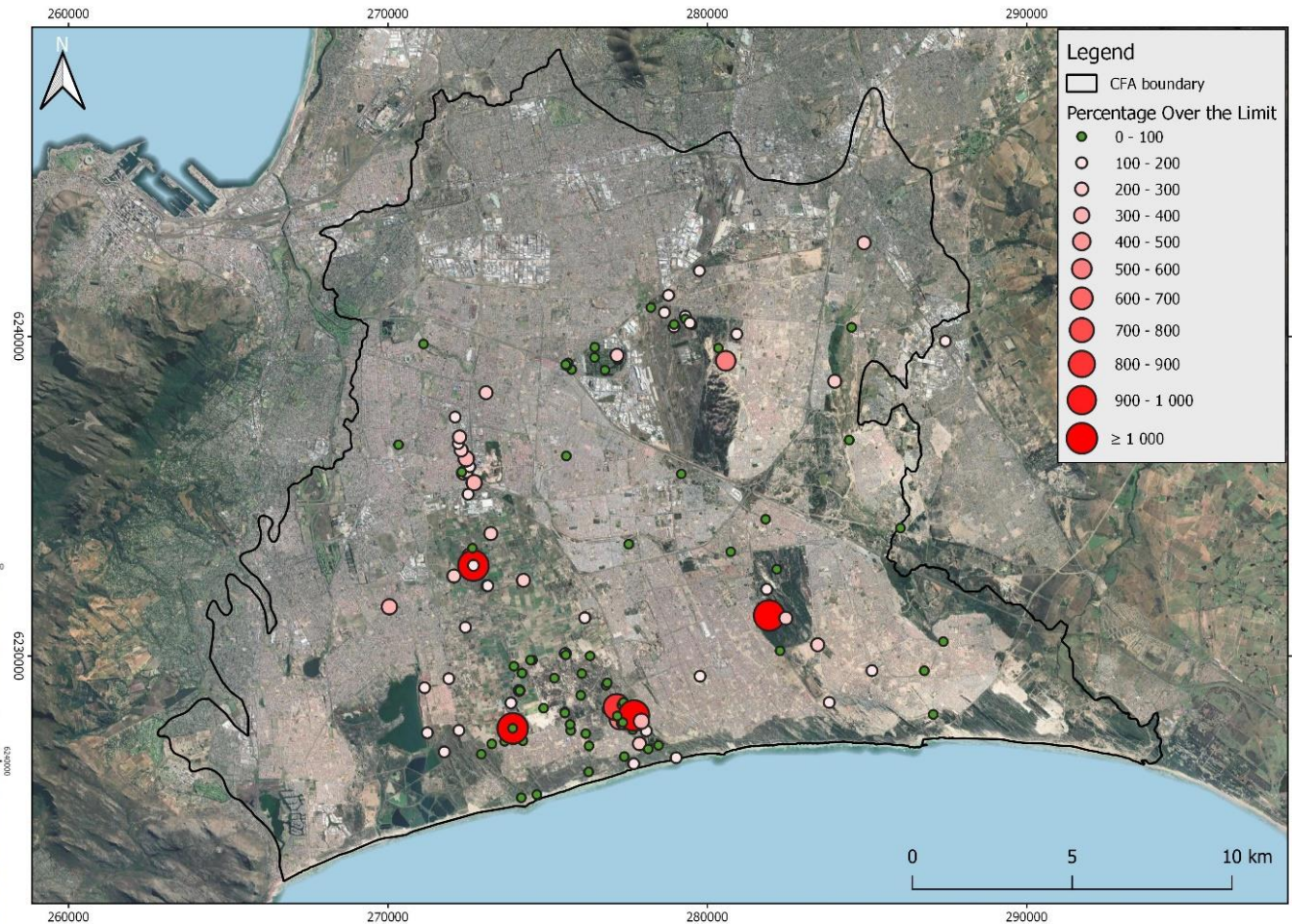
- Plume migration
- Source detection
- Pathogen travel time



CAPE FLATS AQUIFER – WQ ASSESSMENT

- Parameters of concern
 - Salinity
 - Nutrients
 - Metals
 - Organic compounds
- Source areas
 - Urban Agriculture
 - Industrial Areas
 - Sewage and stormwater

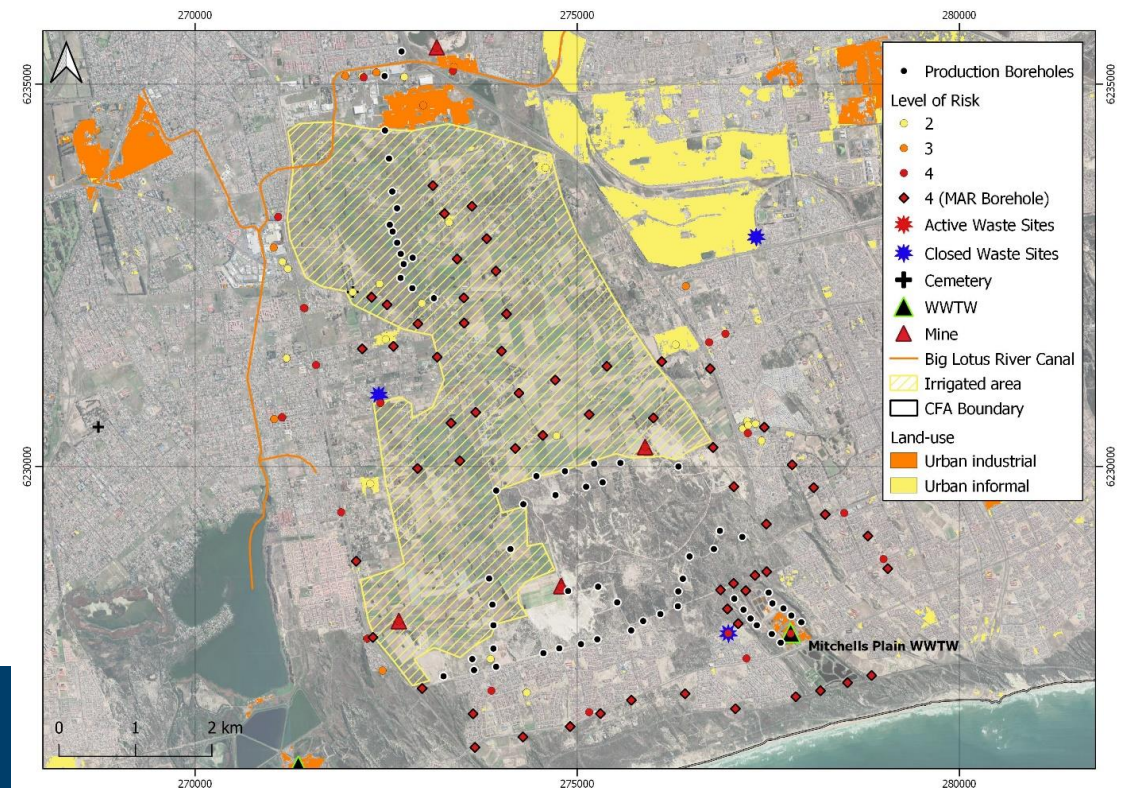
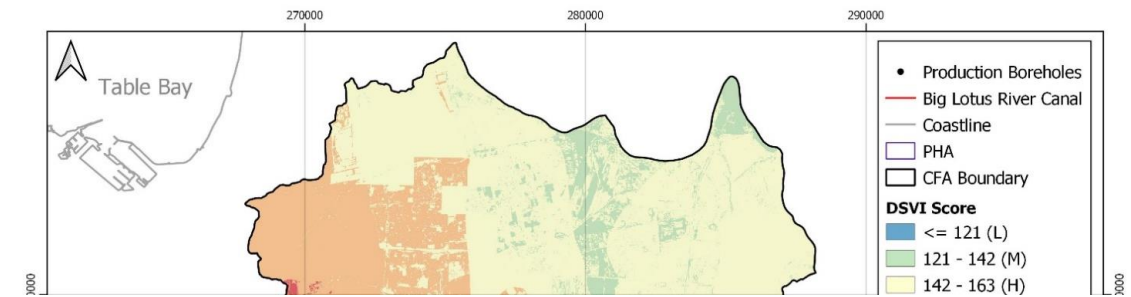
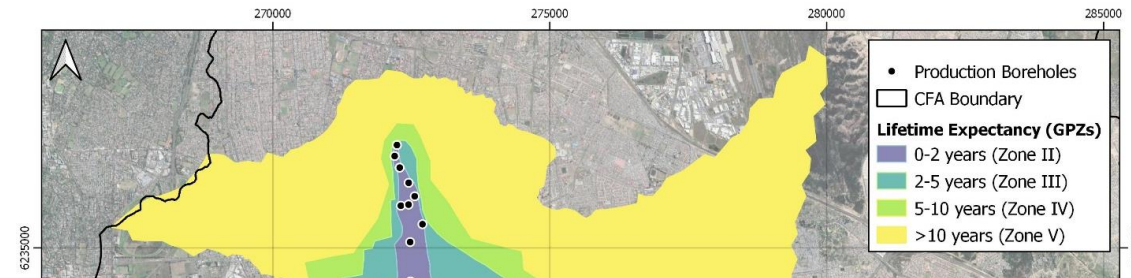
Hotspots



CAPE FLATS AQUIFER – PRODUCTS

Aquifer Protection Scheme

- Capture Zones
 - 50-day, 100-day, 1-year travel
- Groundwater Protection Zones
 - Zone I to V, based on traveltime
- Vulnerability mapping
 - Highly vulnerable to pollution
- Potentially contaminating areas
 - Agriculture, industry, sewage, stormwater, cemeteries
- Risk assessment
 - Source – pathway - receptor
- Rehabilitation plans
 - Site-specific



CAPE FLATS AQUIFER – PRODUCTS

Water Stewardship

- Critical Zone Observatory
- Transformative Art
- Stewardship Workshop



CAPE FLATS AQUIFER – WAY FORWARD

Success factors

- Integration of the triangle
 - System understanding
 - Team interactions
- Social engagement process
 - Established formal platform
 - Wide range of stakeholders
 - Community involvement
 - Quadruple/Quintuple Helix
- Detailed, recent in-situ data
 - Historical data sets
 - Current investigation by City
 - Current monitoring programmes

Next Steps

- Expansion of scope
 - Including surface & stormwater
 - Additional parameters
 - Implementation of GPZs
- Lotus Canal Challenge
 - Rehabilitation plan for degraded stormwater system
 - Water Stewardship & Transformative Art
- Roll-out to other urban centres
 - Testing approach in different settings (e.g. environment, water resources, culture, governance, data availability)



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THANK YOU