Wastewater treatment and climate change

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Wastewater treatment is impacted by climate change

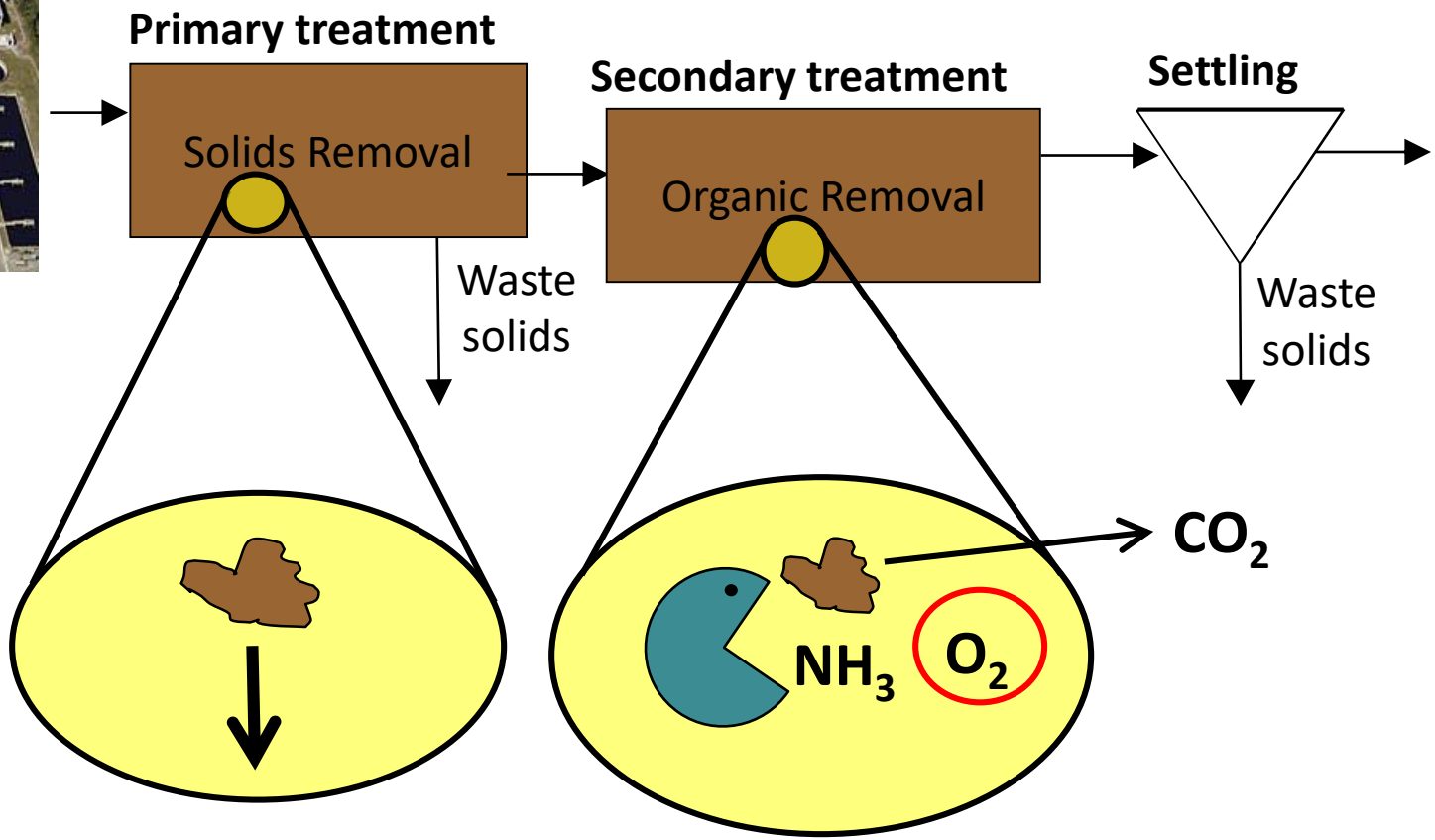
Climate change is impacted by wastewater treatment

What happens in a wastewater treatment plant?

Municipalities

Industries

What happens in a wastewater treatment plant?



How is wastewater treatment impacted by climate change?

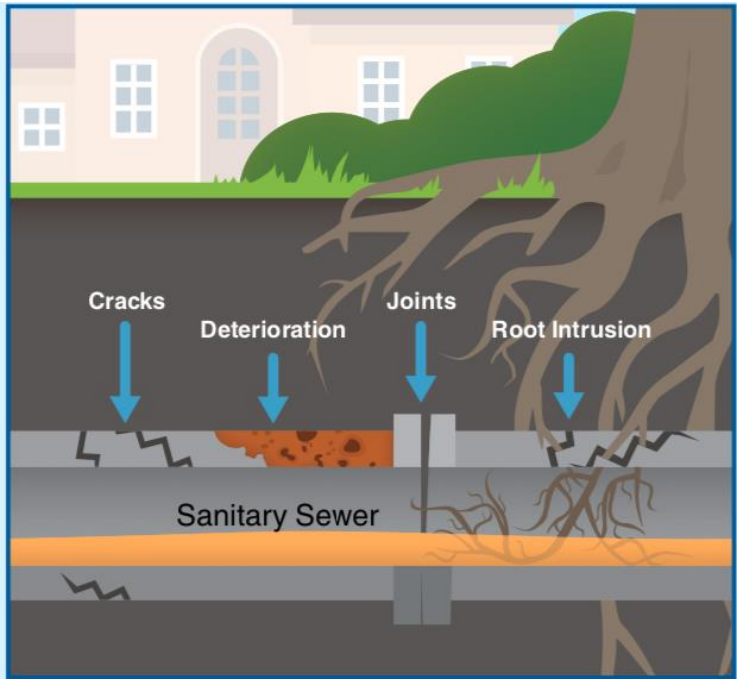
Where does the water flow?

Municipalities

Industries

One primary impact of climate change: Inflow and infiltration

- With increased precipitation and extreme events, there is increased inflow and infiltration (I/I)
- Flows can exceed sewer and plant capacity, causing infrastructure damage, permit violations, and pollution



2040 Water Resources Policy Plan
https://metrocouncil.org/Wastewater-Water/Planning/Wastewater/Inflow-and-Infiltration/Local-Government.aspx?source=child

How is climate change impacted by wastewater treatment?

Wastewater treatment accounts for ~2% of US energy use and contributes ~35 Tg CO_2 equivalents/yr

(USEPA)

Energy costs for wastewater treatment estimated at $2.8 billion in 2010

(Crawford and Sandino, 2010)

GOAL:

Create energy-neutral wastewater treatment plants

- Efficiency improvements
- Use of renewable energy in plant operations
- Energy recovery via waste solids processing
- Recovery of wastewater heat
- Energy recovery via treatment of other industrial and food waste streams
- Low energy nutrient removal

St. Cloud example

St. Cloud's Transformation to Resource Recovery

Expansion & Full Biological Nutrient Removal Project

Solar
- 240 kW

Nutrient Recovery & Reuse Project
- Biofuel Storage
- Class A Biosolids
- Nutrient Recovery

2013 | 2015 | 2016 | 2017 | 2018 | 2019

Energy Efficiency
- LED Lighting
- HVAC Controls
- Air Compressor

Biofuel & Heat Recovery Project

Energy Recovery Phase 2
- 2nd biofuel engine-generator
- Storage digester to primary digester

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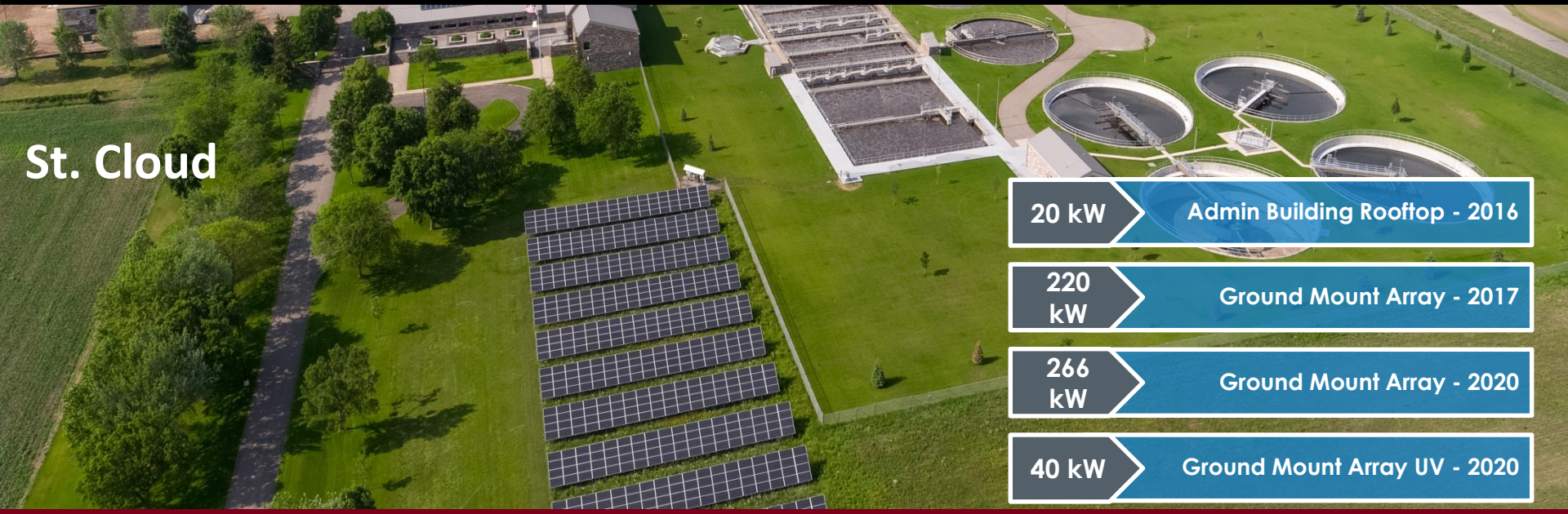
Slide from Tracy Hodel, Public Services Director, City of St. Cloud

Hutchinson

St. Cloud



20 kW	Admin Building Rooftop - 2016
220 kW	Ground Mount Array - 2017
266 kW	Ground Mount Array - 2020
40 kW	Ground Mount Array UV - 2020

Bottom information from Tracy Hodel, Public Services Director, City of St. Cloud

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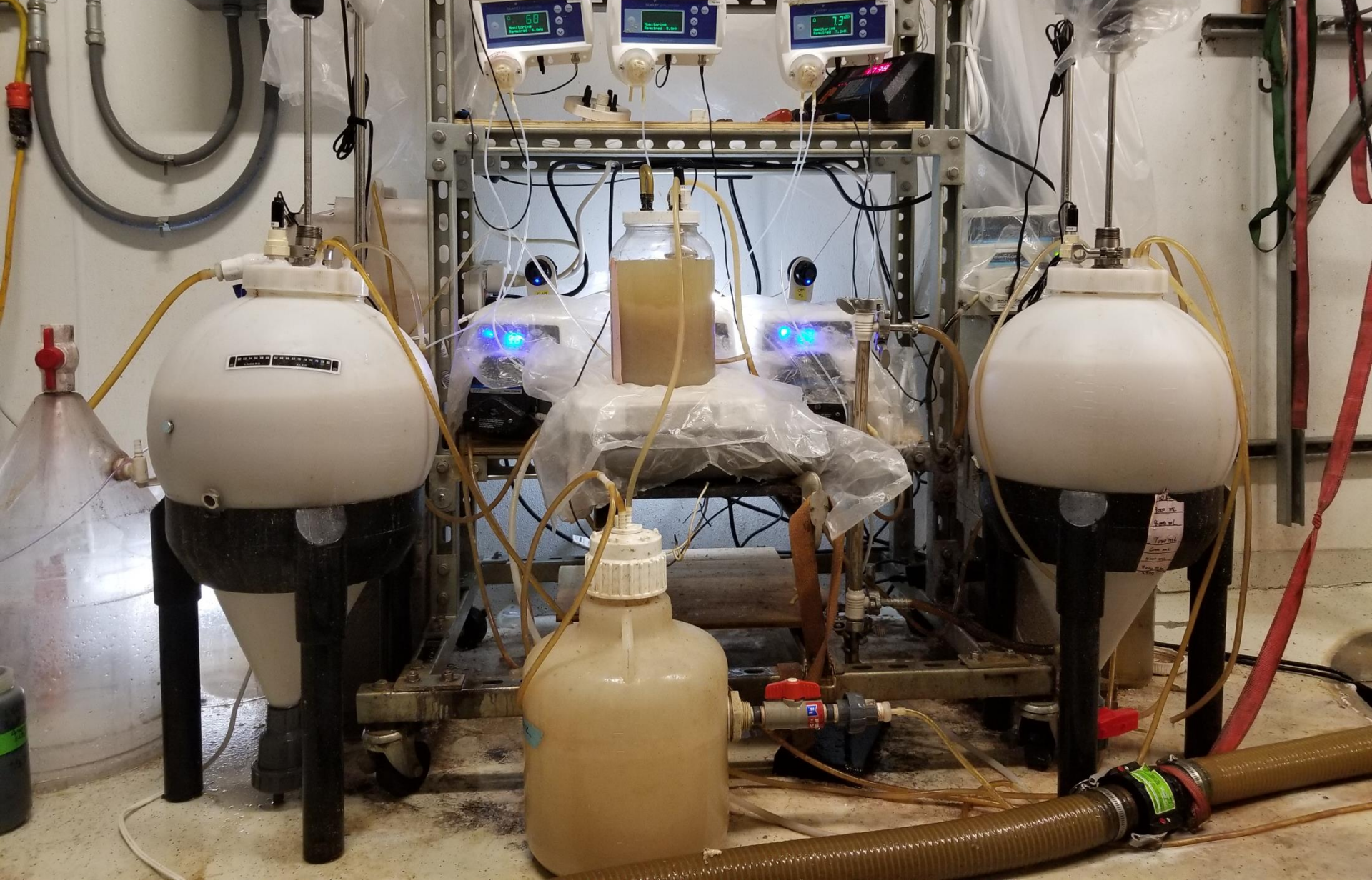
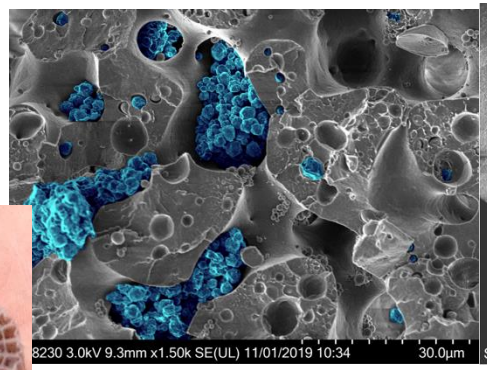
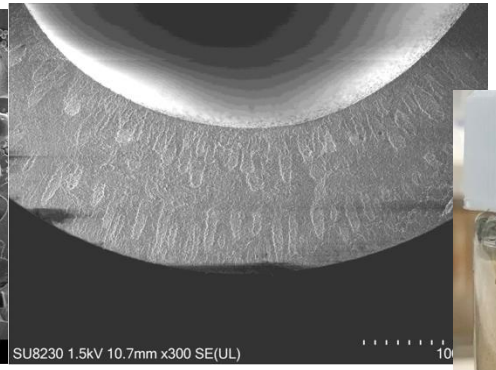


- Low energy NH_3 treatment (“anammox”)
- Uses approximately 1/3 of the energy of traditional treatment





Thank you

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