

The Trees in Town

and

How They Help in a Changing Climate



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Questions to address:

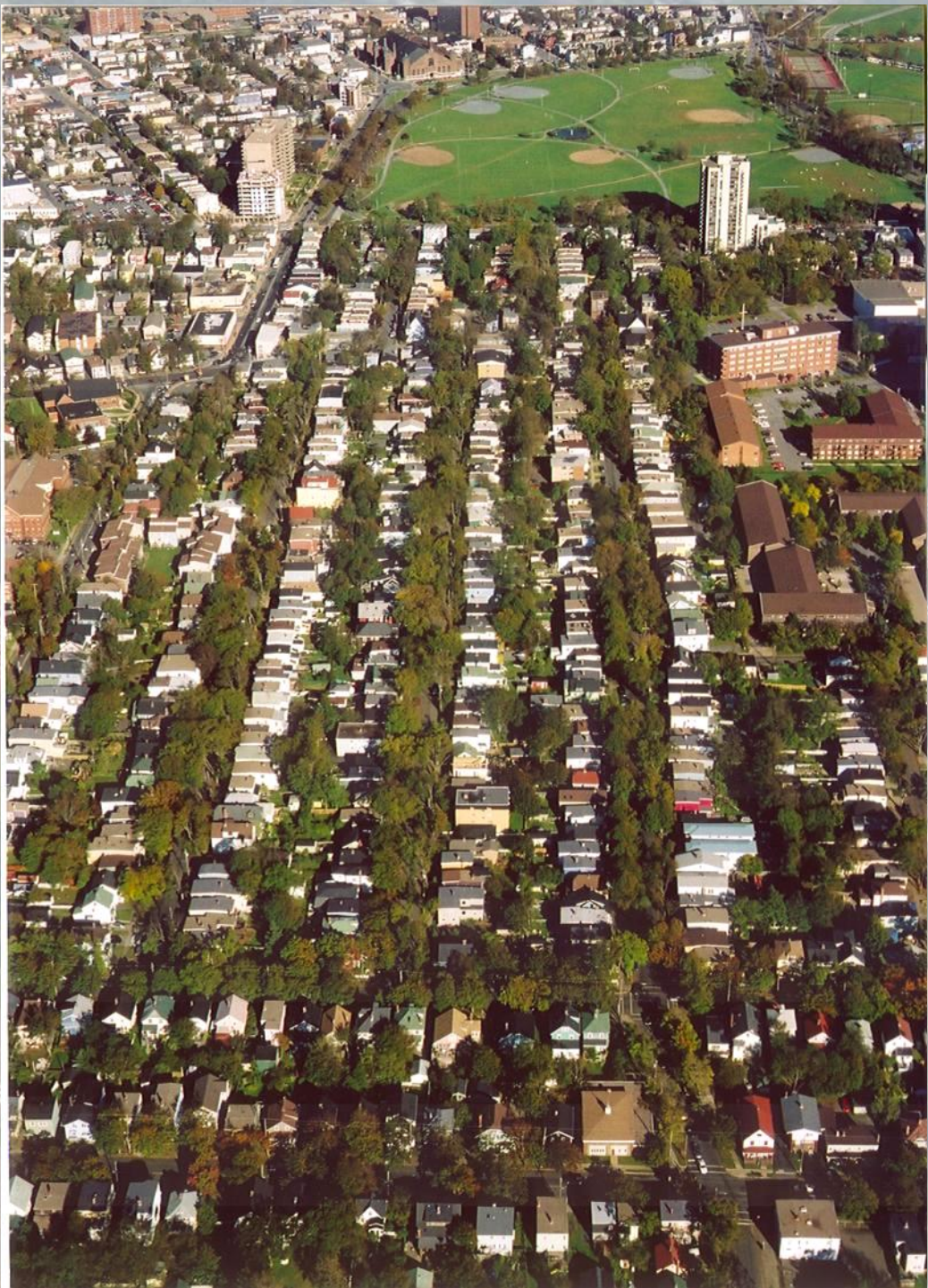
- What is an urban forest?
- How is “green infrastructure” a meaningful concept?
- How do urban trees interact with the atmosphere?
 - Climate on trees
 - Trees on climate
 - Macro-climate
 - Micro-climate
 - Trees and built infrastructure
 - Trees and people
- How should I conclude this presentation?



An aerial photograph of a university campus, showing various buildings, green spaces, and roads. The image is slightly faded to allow the text to stand out. A dark green rectangular border frames the central text.

**How do we
define the
urban forest?**



















What is the urban forest?

- All the trees in the city
- Plus
- All the associated biota
- Plus
- The associated soils, water, and air



What is the urban forest?

- **An urban ecosystem dominated by trees!**



Why should we care about trees as assets (or green infrastructure, or natural infrastructure)?

- **Municipalities – in most of Canada – own a lot of them!**
 - **Many thousands of them, easily into the millions, even hundreds of millions in large municipalities**



Why should we care about trees as assets?

- **They are owned to provide services**
 - **Diverse and abundant services!!**
- **Synonyms for services here – benefits, values**



Why/how do we value city trees?

(see www.halifaxtreeproject.com)

- Beautify the city
- Conserve fuel
- Prolong life of streets
- Reduce energy costs
- Enhance safety
- Provide shade
- Business opportunities
- Draw tourists
- Diverse foods
- Foster health
- Recreation opportunities
- Carbon capture & storage
- Cool the city
- Slow down stormwater
- Clean the air
- Improve water quality
- Conserve biodiversity
- Employment
- Increase property values
- Learning opportunities
- Sense of place
- Sense of well-being

Why should we care about trees as assets?

- They may cost a lot per unit
 - Very roughly, a thousand dollars to plant a street tree!



Why should we care about trees as assets?

- **Municipalities – in most of Canada – own a lot of them!**
 - Many thousands of them, easily into the millions, even hundreds of millions in large municipalities
- **They are owned to provide services**
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What makes trees/woodlands as assets different from built assets?

- **Built assets:**

- degenerate as soon as built
- limited array of degeneration factors
- generally stay put
- each provides a narrow range of services
- are dead!

- **Trees/woodlands:**

- increase in services/values for many decades after installation
- wide range of degeneration factors (storms, insects, diseases, etc.)
- expand over time – down, up, sideways
- each provides an incredible range of services
- are alive!

How do urban trees interact with the atmosphere?

Atmosphere  *trees*



Atmosphere
(Climate)

Carbon

Water

Wind

Heat

Pollutants

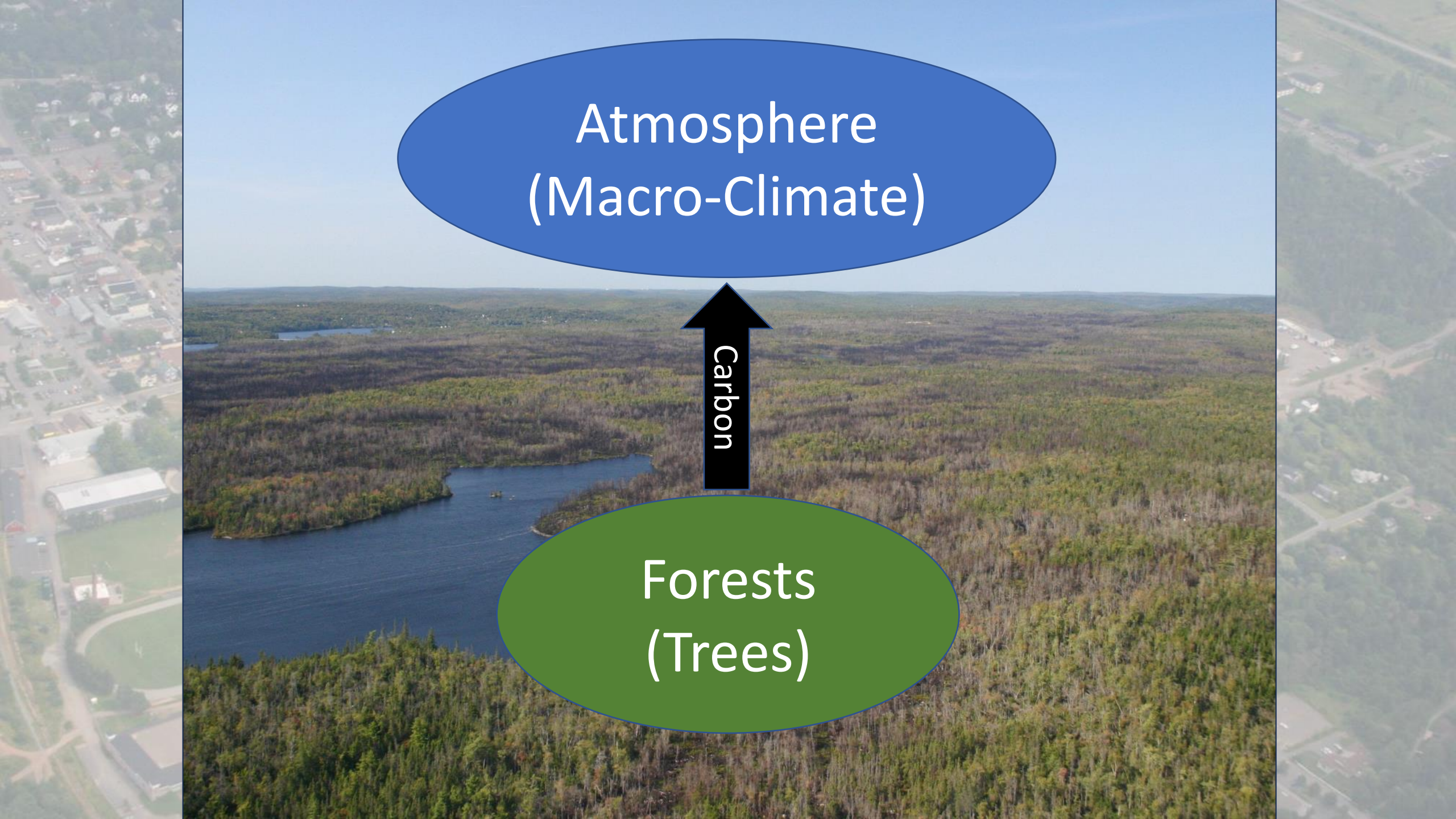
Light

Forests
(Trees)

How do urban trees interact with the atmosphere?

Trees → *climate: macro-climate*



An aerial photograph of a dense forest with a winding lake. A blue oval at the top contains the text 'Atmosphere (Macro-Climate)'. A black arrow points upwards from a green oval at the bottom containing the text 'Forests (Trees)'. The word 'Carbon' is written vertically on the arrow. The background shows a mix of green and brown trees, suggesting a transition or a specific season.

Atmosphere
(Macro-Climate)

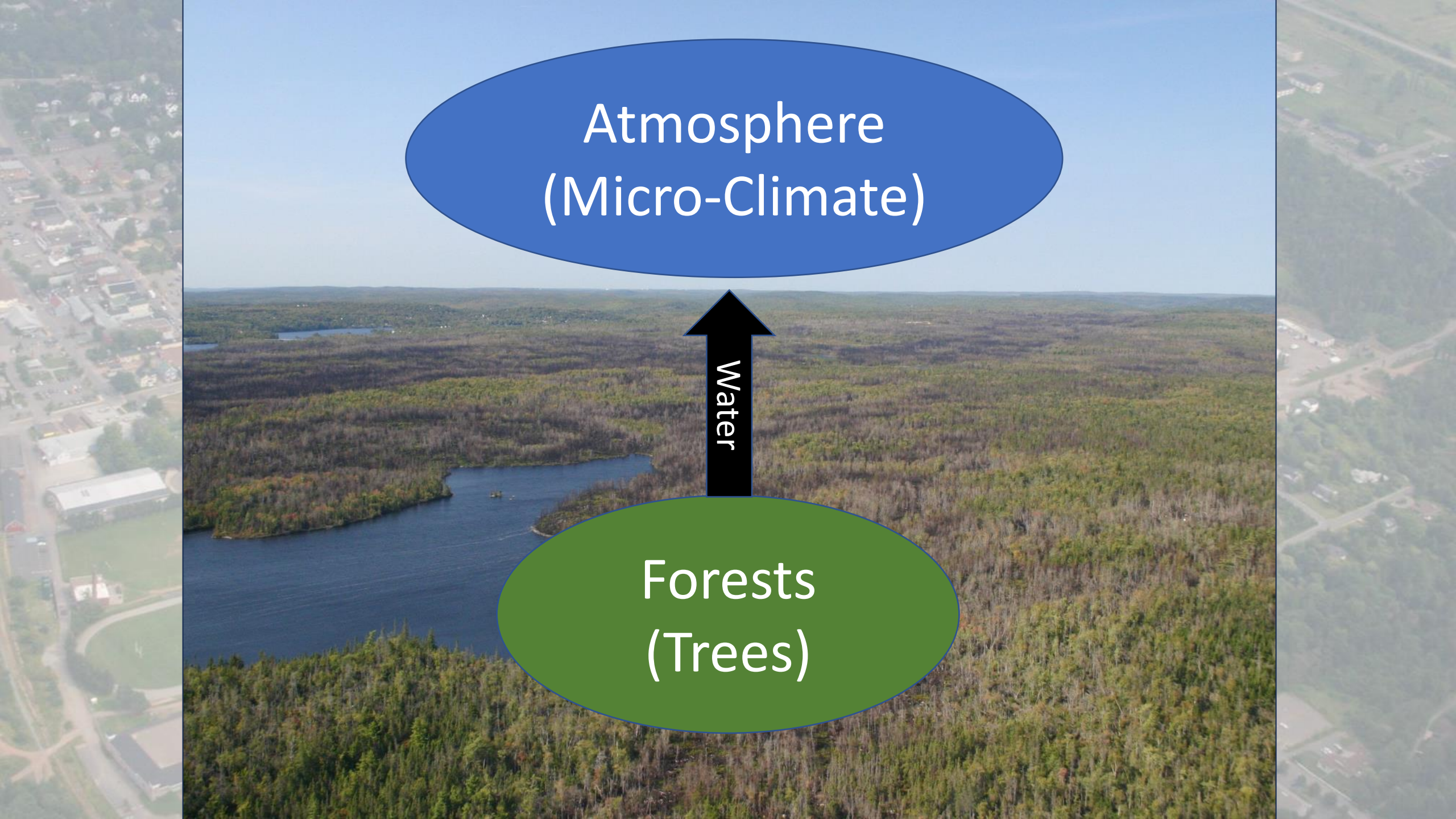
Carbon

Forests
(Trees)

How do urban trees interact with the atmosphere?

Trees → climate: micro-climate (weather)



An aerial photograph of a dense forest with a winding lake. A diagram is overlaid on the image, consisting of a blue oval at the top, a black arrow pointing upwards, and a green oval at the bottom. The blue oval contains the text 'Atmosphere (Micro-Climate)', the arrow contains the text 'Water', and the green oval contains the text 'Forests (Trees)'.

Atmosphere
(Micro-Climate)

Water

Forests
(Trees)

Urban Heat-Island Effect

- **Temperatures are always higher at the centre of a city/town than at the periphery**
- **This is due to the high density of heat-producing infrastructure (vehicles, buildings, people) and the capture of solar radiation by inert surfaces**
- **Trees are the best approach to try to reduce the excessive heat in downtowns**

Trees and built infrastructure



Trees and people



Why/how do we value city trees?

(see www.halifaxtreeproject.com)

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How should I conclude this presentation?

- Review
- 1. Urban forests are tree-dominated urban ecosystems (all the trees plus associated biota and abiotic elements).
- 2. It's high time to see urban trees as dynamic green infrastructure that mostly improve with time!
- 3. No other type of infrastructure conveys as many benefits as urban trees!
- 4. Trees interact with the climate in complex and diverse ways.
- 5. **Urban trees** can play a modest role in CC mitigation but a *huge role in CC adaptation* – they make cities/towns/villages more livable and sustainable.
- 6. Investments in trees pay huge dividends to society.

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