

Adapting to Changing Climate Conditions in Waterloo Region: Setting the Regional/Municipal Context

October 24, 2014 – David Roewade, Region of Waterloo



Issues to Consider

- Changing climate and extreme weather
- Proactive vs. reactive costs
- Asset management of our aging infrastructure
- Election and new direction of Councils
- Social and economic impacts
- Community growth and land-use planning

Issues to Consider

- Changing climate and extreme weather

Recent climate for Southern Ontario: 1948 – 2013 is warmer and wetter

- Temperature

- Warmest springs: 2010 and 2012
- Hottest summer: 2005,
- 2012 was 2nd warmest winter
- 2012 was 2nd hottest year overall in 66 years

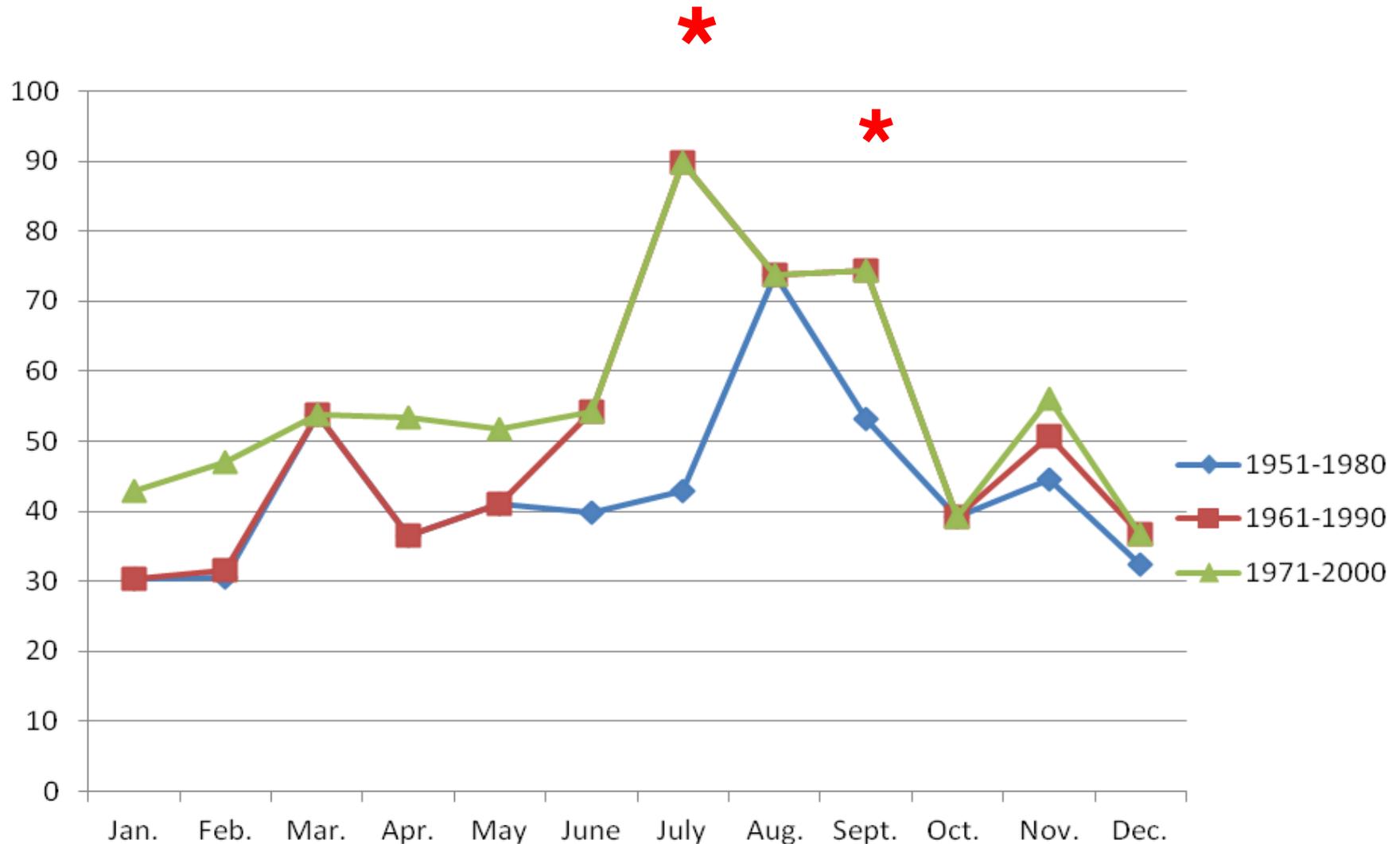
- Precipitation (rain and snow)

- Wettest spring 2011, winter 2008, summer 2008,
- Top 3 wettest years overall = 2008, 2006, 2011

Impact of Change Comes in Bursts

- Climate change impacts our lives on a daily scale, not in monthly and annual averages:
 - **15 new daily extremes** in local temperature and precipitation during 2001-2013
- 7 Major Floods from Intense Precipitation in Ontario, 2002–2013 – examples include:
 - Hamilton, London, Peterborough, Toronto
 - In 2005, 100 mm rain in 1 hour, washed out 30 metres of Finch Ave. in Toronto

Extreme Daily Precipitation (mm) During 30 yr. Climate Periods – Waterloo Region



Is anyone paying attention to the wind?

- Maximum wind gust - new daily extremes:
 - 2001 (October)
 - 2002 (February)
 - 2007 (May)
 - 2008 (December)
 - 2009 (April)
 - 2013 (July → 119 kilometres per hour)
- Are our communication towers, hydro wires, solar panels and other rooftop equipment built to withstand these increased gusts?

Recent Storm Events

Torrential rain cause traffic tie-ups and localized flooding

CTV Kitchener, Published Friday, June 28, 2013

Photo: Flash flooding is seen at Fairview Park Mall in Kitchener, Ont.,
(Courtesy Driveseat Kitchener)



Recent Storm Events - Continued

Waterloo Region cleans up after fierce storm

Hydro crews work feverishly to restore power after strong winds down trees, hydro poles

By Colin Butler, [CBC News](#) Posted: Jul 20, 2013

Ice storm damage in Waterloo Region worth at least \$1.2M

[CBC News](#) Posted: Jan 12, 2014

Saturday night storm slams Kitchener

Jul 29, 2013

Waterloo Region Record
By Linda Givetash

KITCHENER — Residents were cleaning up downed trees for the second time in eight days after a sudden, powerful storm hit some neighbourhood Saturday night.

...Straight line winds gusting to about 100 kilometres per hour lifted shingles off rooftops, took down tree limbs and knocked out power.

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- Social and economic impacts

Impacts on Vulnerable Populations



- Among homeless people, weather conditions such as extreme rain, heat and cold worsened pre-existing health conditions such as mental illness, respiratory and cardiovascular diseases, social isolation and drug use (Wandel et. Al., 2010)

Public Health Risks

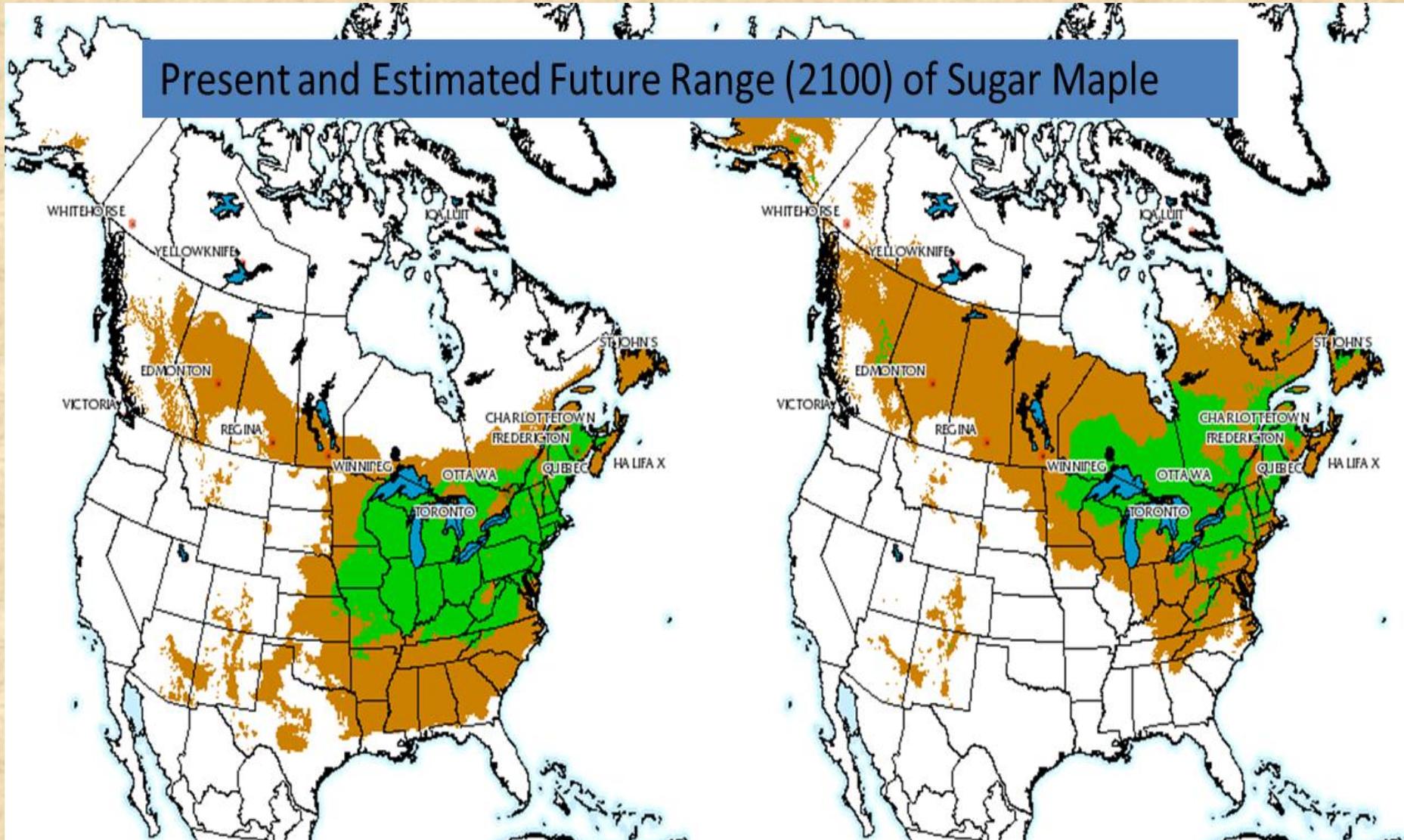
Potential Direct Health Impacts in urban areas

- More extreme weather events, including heat waves
- Increased air pollution (eg. ozone)
- Increased vector-borne illnesses 
- Increased illnesses from food and water contamination
- More allergies from altered pollination seasons



Vegetation Shift due to Climate Change

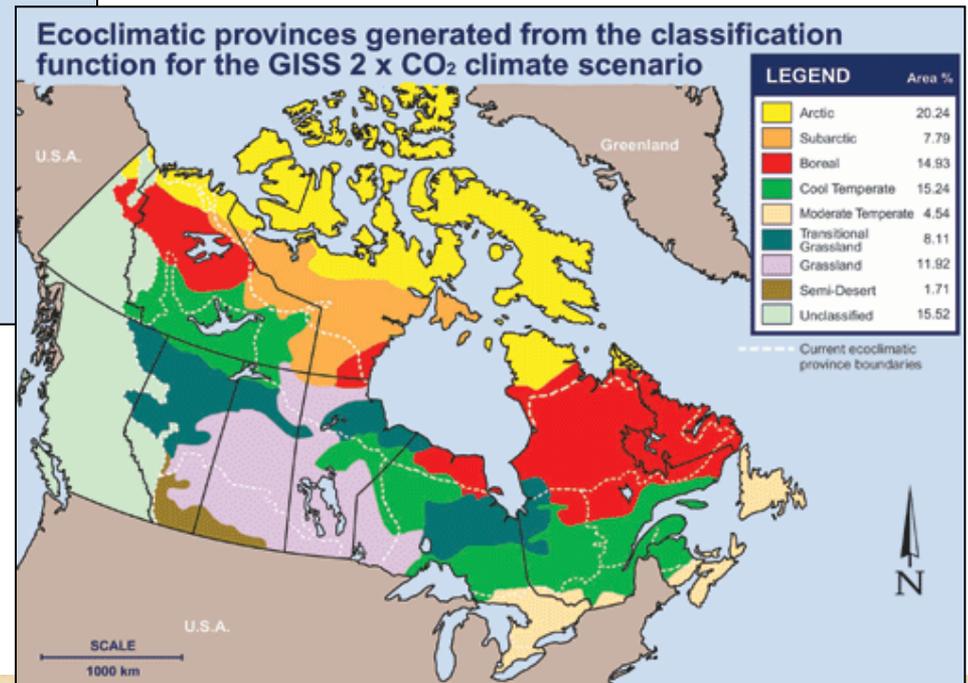
Present and Estimated Future Range (2100) of Sugar Maple



Ecoclimatic Impacts



← Existing

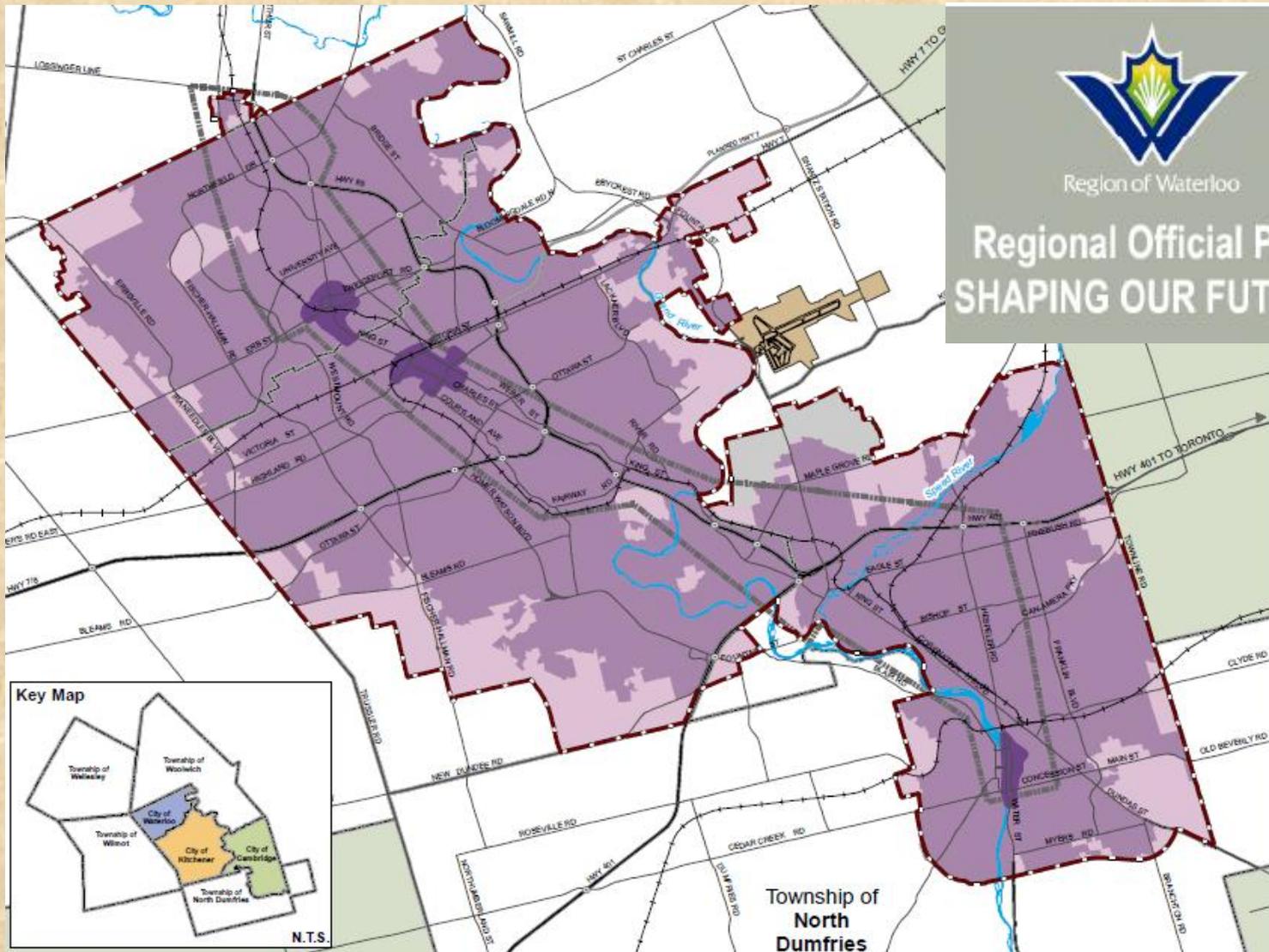


With Doubled CO₂e →

Issues to Consider

- Changing climate and extreme weather
- Proactive vs. reactive costs - e.g. storms
- Asset mgmt. – updating aging infrastructure
- Election and new direction of Councils
- Impacts to socio-economic dimensions
- **Community growth and land-use planning**

Growing Urban Areas: Opportunities?



Region of Waterloo

Regional Official Plan
SHAPING OUR FUTURE

Innovative flood control: Bioswales

