

# The 2015 Summer Storm:

## After the Storm Symposium



**Rob Landucci**  
**Urban Forestry Manager**

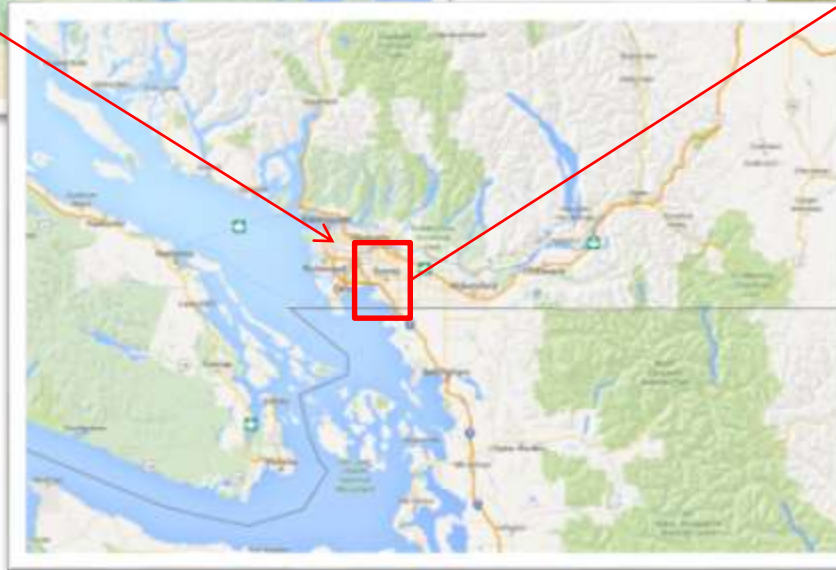
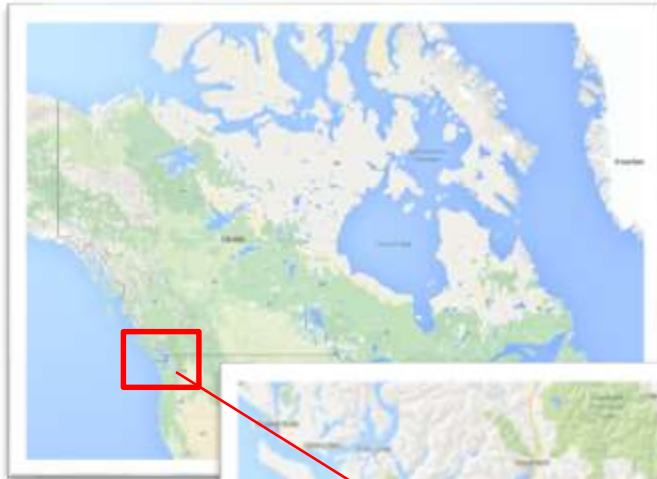
# Outline

- About Surrey
- Urban Forest Management
- Storms in Surrey
- Teachable moments
- New Initiatives



# About Surrey

## Where are we?



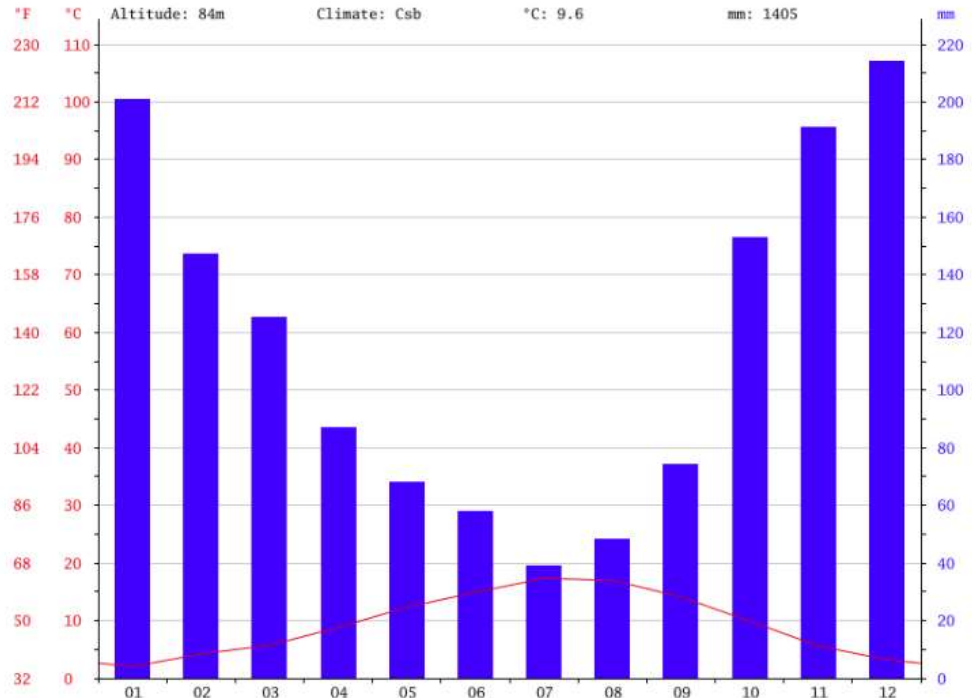


# About Surrey

## Normal Weather Patterns



[https://www.meteoblue.com/en/weather/forecast/modelclimate/vancouver\\_canada\\_6173331](https://www.meteoblue.com/en/weather/forecast/modelclimate/vancouver_canada_6173331)



<https://en.climate-data.org/north-america/canada/british-columbia/surrey-4345/#climate-graph>

# Urban Forest Management Guiding Policies



# Urban Forest Management

## Urban Forestry Section





# Urban Forest Management

## Urban Forestry Section



# Urban Forest Management Operational Programs

City of Surrey

Parks, Recreation and Culture  
Department

## Overview of The Natural Areas Management Plan: Strategic Directions

Greg Ward  
Manager, Park Urban Forestry and Environmental Services

Edited by Diana Wegner  
Professional Writer





# Urban Forest Management Operational Programs



# Urban Forest Management Operational Programs





# Urban Forest Management

## Tree Risk Management





# Urban Forest Management

## Tree Risk Management

### Scheduled Tree Work Shade Tree Team

- Pruning
- Arterial road inspections
- Budget



# Urban Forest Management

## Tree Risk Management

### Scheduled Tree Work Natural Area Team

- Scheduled tree risk assessment
- Budget



# Urban Forest Management

## Tree Risk Management

### Capital 1-5 Program

- New forest edges
- Assessment and replanting
- Budget



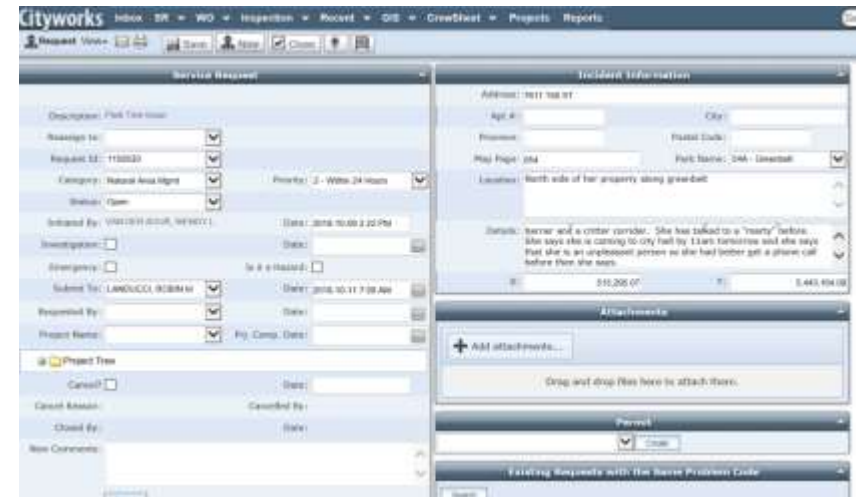


# Urban Forest Management

## Tree Risk Management

### Demand Tree Work

- Resident requests
- Work control



# Urban Forest Management

## Tree Risk Management

### Demand Tree Work

- Tree risk assessments
- Budget



# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Define categories of storms
- Establishes procedures, roles and responsibilities
- Establishes priorities





# Urban Forest Management

## Tree Risk Management



# Storm Response Plan

- Pre-season planning



### *Rights of Access Agreement*

I/We the undersigned \_\_\_\_\_ Owner(s) \_\_\_\_\_ Tenant(s) agree to allow the City of Surrey and its employees, agents, contractors and subcontractors (the Grantee) to enter my/our land known and described as:

Civic Address: \_\_\_\_\_

These rights granted to the Grantee include the right to enter the land with Grantee's vehicles, equipment and materials for the purpose of removing tree residue (or other as described below)

In return for the City responding to our service request, the undersigned covenants and agrees that neither the City of Surrey nor any of its employees, agents, or contractors shall be held liable for any loss or damage to persons or property arising in the course, or related to the removal of the trees, whether caused by negligence or otherwise.

It is understood that the rights granted by the Agreement are not permanent rights of access and this Agreement will remain in effect only until the works referred to above have been completed.

It is further understood that by undertaking the works referred to herein, the City does not thereby expressly or by implication accept liability on the part of the City with respect to tree failure(s) and damage caused by such tree failure(s).

Dated this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_  
Month Year

W. J. GIBSON

Owner(s)/Tenant(s)

(please print name)

(please print name)

Address

## Address

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# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Storm Categories
  - Minor
  - Major

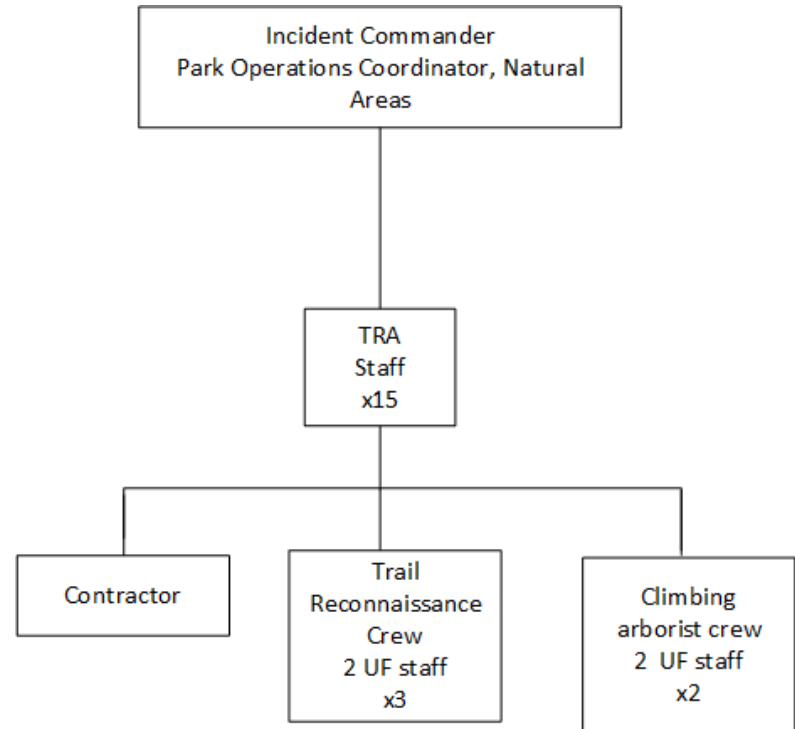


# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Incident commander
- Priorities





# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Tree Risk Assessors
- Climbing crew
- Reconnaissance crews



# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Parks operations
- Eng - Streets





# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- Private property
- Risk management





# Urban Forest Management

## Tree Risk Management

### Pre-season Meeting

- Review the Storm Response Plan with UF staff
- Review roles and responsibilities
- Review Standard Operating Procedures
- Ensure equipment and materials are ready for the season

### Initial Storm Response Planning Meeting

- Determine what level of storm response is required
- Identify the Incident Commander
- Determine staffing for required roles

### Storm Response Meeting

- Introduce the IC
- Allocate staff and equipment
- Review responsibilities of staff
- Review Standard Operating Procedures

# Storms

## “The southeasterly windstorm trackway”



Figure 1: The tracks of all extratropical cyclones that produced peak 2-minute winds of  $\geq 63$  km/h and or peak 3- to 5-second gust  $\geq 89$  km/h at either Victoria, Vancouver or Abbotsford for the 23 years 1994-2016 (inclusive). The paths are color coded to indicate peak wind direction: southeasterly windstorms are orange, westerly are blue, southerly and southwesterly are brown, and easterly are white.

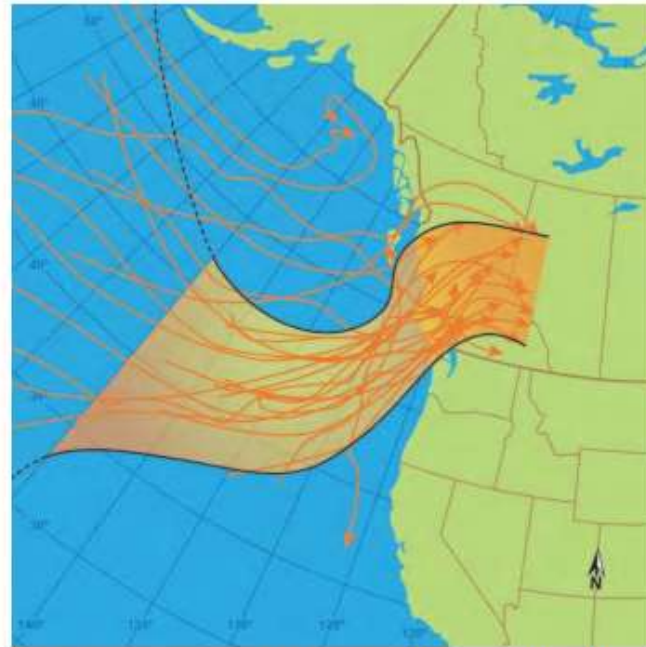


Figure 2: The tracks of all low-pressure centers that triggered southeasterly windstorms in southwest BC from 1994-2016. The region that contains most of the paths is highlighted, forming the Southeaster Trackway.

Read, Wolf 2016. CMOS Bulletin 44:83-89

# Storms

“The southeasterly windstorm trackway”



[https://www.google.ca/search?q=extratropical+cyclones+august+2015&rlz=1C1GCEA\\_enCA792CA792&source=Inms&tbm=isch&sa=X&ved=0ahUKEwj\\_ulXKx\\_reAhWzoFsKHRqRA3wQ\\_AUIDigB&biw=1680&bih=908#imgdii=QLFDTFud1fGMkM:&imgsrc=J5C5sjhHoR2meM](https://www.google.ca/search?q=extratropical+cyclones+august+2015&rlz=1C1GCEA_enCA792CA792&source=Inms&tbm=isch&sa=X&ved=0ahUKEwj_ulXKx_reAhWzoFsKHRqRA3wQ_AUIDigB&biw=1680&bih=908#imgdii=QLFDTFud1fGMkM:&imgsrc=J5C5sjhHoR2meM):



# Storms

“The southeasterly windstorm trackway”

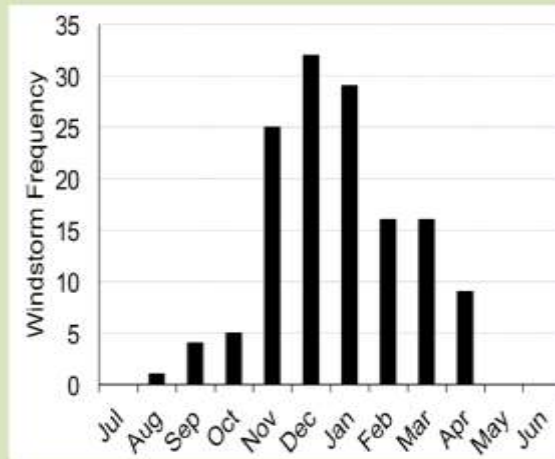


FIGURE 2. For Vancouver, Victoria and Abbotsford, BC, the monthly frequency of windstorms with peak 1- or 2-minute wind  $\geq 63$  km h<sup>-1</sup> and/or peak gust  $\geq 89$  km h<sup>-1</sup>. This is for the 52 years 1964-2015. Total number of events is 137. Data for 1964-2012 are from Read (2015), with wind records from Environment Canada used for the final three years up to 2015. Read, Wolf 2016. CMOS Bulletin 44:83-89.

# Storms

August 2015 – An unusual summer wind



# Storms

## August 2015 – An unusual summer wind

TABLE 1. The 1981-2010 climate normals for Vancouver and Abbotsford shown against the monthly statistics for 2015. Two values are shown for the August 2015 precipitation totals: numbers in *italics* are monthly totals, and those in brackets are for the period before the windstorm, 01 to 28 August. Data are from Environment Canada.

### 1981-2010 Normals

Month	Vancouver, BC				Abbotsford, BC			
	Temperature (°C)			Avg Pcpn (mm)	Temperature (°C)			Avg Pcpn (mm)
	Avg Hi	Avg Lo	Mo Mean		Avg Hi	Avg Lo	Mo Mean	
May	16.7	8.8	12.8	65.0	18.1	7.8	13.0	99.8
June	19.6	11.7	15.7	53.8	20.8	10.5	15.7	74.8
July	22.2	13.7	18.0	35.6	24.0	12.2	18.1	43.2
August	22.2	13.8	18.0	36.7	24.4	12.0	18.2	45.9

### 2015 Statistics

Month	Vancouver, BC				Abbotsford, BC			
	Temperature (°C)			Total Pcpn (mm)	Temperature (°C)			Total Pcpn (mm)
	Avg Hi	Avg Lo	Mo Mean		Avg Hi	Avg Lo	Mo Mean	
May	18.7	10.6	14.7	4.2	20.5	9.5	15.0	8.6
June	22.3	13.3	17.9	11.0	25.4	12.0	18.8	12.1
July	23.4	15.2	19.4	20.8	26.9	14.0	20.5	51.9
August	22.3	14.5	18.4	<i>67.8 (20.0)</i>	25.7	13.0	19.4	<i>43.3 (8.8)</i>

Read, Wolf 2016. CMOS Bulletin 44:83-89



# Storms

August 2015 – An unusual summer wind

Fire season



# Storms

August 2015 – An unusual summer wind





# Storms

August 2015 – An unusual summer wind





# Storms

August 2015 – An unusual summer wind

The response



# Storms

August 2015 – An unusual summer wind

The response



# Storms

August 2015 – An unusual summer wind

The aftermath

- Natural areas
- Shade trees





# Storms

August 2015 – An unusual summer wind

The aftermath

- Cottonwoods



# Storms

August 2015 – An unusual summer wind

The aftermath

- Cottonwoods





# Storms

August 2015 – An unusual summer wind

The aftermath

- Natural areas
- Shade trees





# Storms

August 2015 – An unusual summer wind

The aftermath

- Costs



# Storms

August 2015 – An unusual summer wind

The aftermath



# Storms

August 2015 – An unusual summer wind

The aftermath

- Trail repairs





# Storms

August 2015 – An unusual summer wind

The aftermath

- Replanting



# Provincial disaster funding



File DFA-1516-03

Application #151007-D6FC-5070

April 26, 2016

Kuljeet Grewal  
Finance PRC Business Manager  
City of Surrey  
13450 104 Avenue  
Surrey BC

Dear Kuljeet Grewal

Re: Disaster Financial Assistance (DFA) Recovery Plan Approval:  
DFAGEN 15/16 Aug 26 to Sept 2, 2015

We are in receipt of the City of Surrey's recovery plan that describes recovery work required to restore the City's infrastructure to pre-event conditions for damages attributed to the Aug 26 to Sept 2, 2015 DFA event.

In accordance with Section 33(7)(b) of the Compensation and Disaster Financial Assistance (C&DFA) Regulation, we are notifying you of our decision to approve the City of Surrey's recovery plan. The recovery plan has been approved to a maximum of \$370,914.66. Eligible recovery costs will be considered for the approved projects outlined on the enclosed Recovery Plan and Project Status Report.

Recovery Plan Approval:

[illegible]

# Teachable Moments

## Funding

### Provincial disaster funding

Department/Division	Project Work	Recovery Amount Claimed- Apr 2016	EMBC Approved Apr-17
PRC- UFEP	Tree Removal- Road Allowance	\$ 112,032.50	\$ 72,993.21
PRC-UFEP	Tree Removal- Parkland	\$ 191,202.54	\$ 130,130.70
PRC- UFEP	Staff Overtime	\$ 16,062.52	\$ 3,194.09
	SUBTOTAL	\$ 319,297.56	\$ 206,318.00
	Eligible Recovery- PRC	\$ 255,438.05	\$ 165,054.40
		80%	80%



# Teachable Moments

## Operational programs

### Structural pruning



# Teachable Moments

## Operational programs

### Planting



Recommended **Boulevard** tree list 2011

TREE NAME	HEIGHT	SPREAD
<b>SMALL BOULEVARD TREES</b> (up to 9 metres in height)		
<i>Acer campestre</i>	8m	8m
<i>Acer campestre</i> 'Red Shine'	8m	8m
<i>Acer ginnala</i>	6m	6m
<i>Acer griseum</i>	8m	6m
<i>Acer palmatum</i>	7m	7m
<i>Acer platanoides</i> 'Columnare'	9m	5m
<i>Acer platanoides</i> 'Crimson Sentry'	7m	4m
<i>Acer platanoides</i> 'Globosum'	5m	7m
<i>Acer rubrum</i> 'Scanlon'	9m	5m
<i>Acer truncatum</i> 'Pacific Sunset'	9m	8m
<i>Acer truncatum</i> 'Norwegian Sunset'	9m	8m
<i>Carpinus japonica</i>	6m	7m
<i>Cercis canadensis</i>	9m	9m
<i>Cercis canadensis</i> 'Forest Pansy'	9m	9m
<i>Cornus kousa</i> 'Satomi'	6m	6m
<i>Cornus rutban</i> 'Aurora'	7m	5m
<i>Cornus rutgan</i> 'Stellars Pink'	6m	6m
<i>Crataegus x lavallei</i>	9m	6m
<i>Magnolia denudata</i>	9m	7m
<i>Magnolia</i> 'Elizabeth'	8m	5m
<i>Magnolia kobus</i>	9m	7m
<i>Parrotia persica</i>	9m	6m
<i>Parrotia persica</i> 'Inges Ruby Vase'	10	6m
<i>Prunus yeodensis</i> 'Akebono'		

# Teachable Moments

## Operational programs

### Communication

- Contracting work





# Teachable Moments

## Operational programs

### Communication

- Year round
- Inter-department



# Teachable Moments

Operational programs

Planting stock



# Teachable Moments

Development

Soil volume





# Teachable Moments

## Development

### Root barriers



# Teachable Moments

## Failure patterns





# New Initiatives

Documenting failure patterns

Cottonwood failures





# New Initiatives

## New failure patterns

### Cottonwood failures



# New Initiatives

## Forest professionals

Forest health





# New Initiatives

## Forest professionals

Wind firming treatments





# Questions?

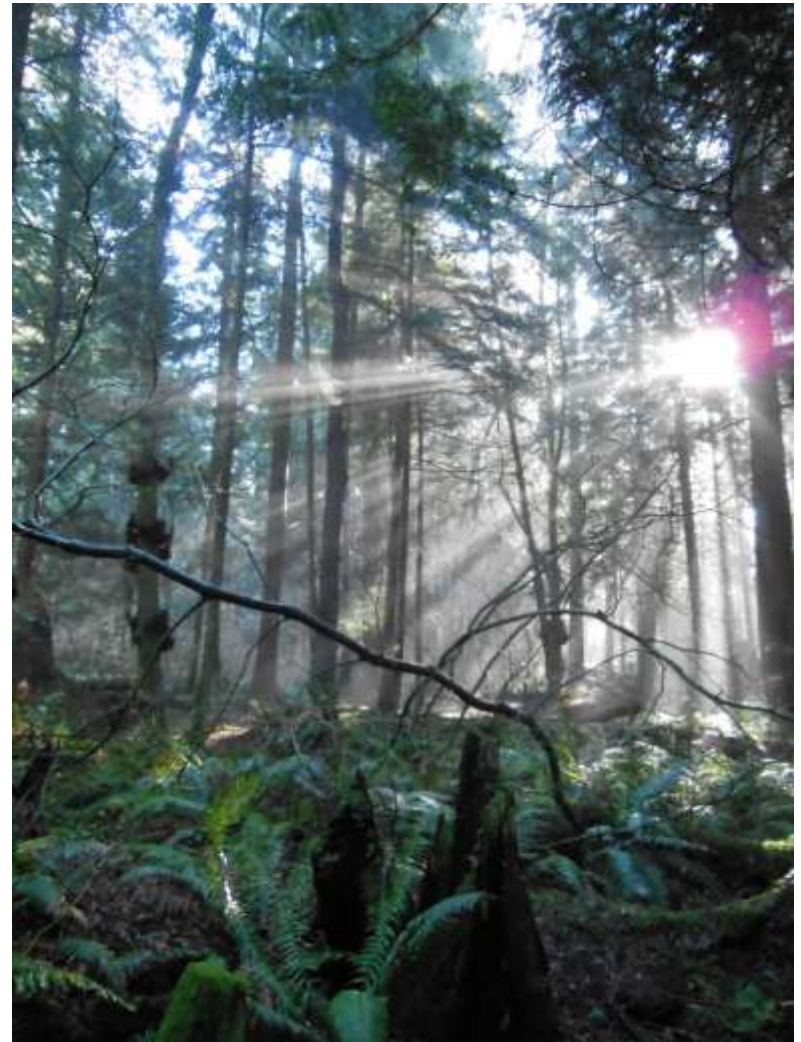
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- <https://en.climate-data.org/north-america/canada/british-columbia/surrey-4345/#climate-graph>

Thank you!

Rob Landucci

robinlanducci@surrey.ca









# Urban Forest Management

## Tree Risk Management

### Storm Response Plan

- When is a storm a storm



# Lessons Learned

## Development

### New forest edge

