

# Climate Change Adaptation Fundamentals



# Climate Change Adaptation Fundamentals

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# Introduction

Welcome to this 4-week course, Climate Change Adaptation Fundamentals. My name is Dr. Stewart Cohen and I designed this course using videos, discussion forums, and other learning activities each week/module.

This course has been designed to help professionals working across multiple disciplines bring a climate change adaptation lens to their current and future projects. It's structured in four modules, that cover:

- what the current climate change situation is, including the latest science and scenarios;
- why climate change matters to professionals and planners, in terms of risk and impact;
- what we can do about it, through examples and methods of adaptation, and;
- how to bring adaptation tools, data and processes into your work, with a practice project.

At the end of the course, participants will understand basic climate change science and scenarios, and be able to identify the data and tools required to plan an adaptation project.

Each module includes one or more video-lectures and discussion forums that are designed to prompt reflection and integration of core concepts. The final module involves learners in a capstone activity designed to support the application of the learning to a real-world, learner-relevant case example. Each module also contains resources (e.g., relevant reports, video links).

Although you are not required to engage in the learning

activities at any specific time, it is recommended that you complete the activities for each module within that week in order to maximize learning and provide opportunities for meaningful discussion with the instructor and your fellow learners.

Throughout this course we will also be listening to portions of the CBC Podcast 2050: Degrees of Change. This podcast features Johanna Wagstaffe, a Vancouver based meteorologist. It provides a portrait of BC in the year 2050 based on current climate change science projections. The podcast blends evidence-informed perspectives on climate change and climate adaptation with a fictional account of a young girl, Ariadne, as she navigates a climate changed world. Though we provide links to specific clips of interest, you may find it worthwhile to listen to the entire, 7-part series, which you can access here.

We will start here by listening to this excerpt of the CBC Podcast 2050: Degrees of Change News Montage. **Stop listening at 1:44 and continue with this page.**



*An interactive or media element has been excluded from this version of the text. You can view it online here: <https://pressbooks.bccampus.ca/climatechangeadaptationfundamentals/?p=4>*

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The course is guided by myself, Dr. Stewart Cohen, and story



strategist Denise Withers. In the following video, we introduce ourselves and provide an overview of the course.

Video attribution: "Climate Change Adaptation Fundamentals – Module 1 introduction to module 1" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.

I am including a link to my Dr. Climate Change Blog, where you may find some other useful information, tips, and strategies.

And finally, the Course Schedule provides you with an overview of the activities for the next four weeks.

Use the arrows and links in red at the bottom of the page to navigate through the content in each module.

### *Introduction Activity*

Please tell us a little bit about yourself – your professional background and current role, and maybe a little bit about your reasons for taking this course. Here's some other questions you might consider as you introduce yourself:

- Have you encountered climate change issues as part of your work?
- Have you had direct experience applying climate change scenarios within your work?
- Do you feel any sense of optimism sense of optimism that BC (or Canada, or the world) will be able to adapt to future human-caused climate change or do you feel pessimistic about this?
- Who do you consider to be “trusted voices” on climate change?

One of the benefits of sharing is that it helps build a network. Please feel free to share your Social Media links and contact information

### *Reading & Resources*

This page is a compilation of all of the course readings and resources used in all Modules. For any external links to resources, review the rights and permission details. These resources may not be Creative Commons licensed.

Glossary of Key Terms from 2014 IPCC 5<sup>th</sup> Assessment Report, Working Group II

The Canadian Institute for Climate Choices

Adaptation and the Press

Executive Summary of Canada's Changing Climate Report (2019)

Full report (includes link to individual chapters)

Pacific Climate Impacts Consortium (PCIC) is our regional climate service centre. PCIC conducts quantitative studies on the impacts of climate change and climate variability in the Pacific and Yukon region, providing regional climate information for planning.

The BC Government's Resources for Preparing and Adapting to Climate Change is a great resource for existing tools, climate change health facts, the recent BC Climate Risk Assessment, which we discuss in Module 3.

You may also want to dive into Canada's interactive Climate Atlas, where you can explore how various aspects of climate change are playing out in different regions of Canada and explore maps, graphs and **climate** data for provinces, local regions and cities across the country.

The Canadian Centre for Climate Services is another

resource for climate resources, climate change concepts and trends, climate data, and has a climate-service support desk if you have further questions.

Abbott and Chapman – sections on the 2017 wildfire

Canada's Changing Climate Report – Executive Summary

Canada's Changing Climate Report – Chapter 8

IPCC 5<sup>th</sup> Assessment, Working Group II, Summary for Policymakers (SPM)

Council of Canadian Academies, Canada's Top Climate Change Risks – method and summary of results

BC Government, Preliminary Strategic Climate Risk Assessment for British Columbia – method and summary of results

Cohen, S. J. (2010). From observer to extension agent – using research experiences to enable proactive responses to climate change. *Climate change*, 100(1), 131-135.

Sendai Framework for Disaster Risk Reduction A global, non-binding agreement followed by 187 countries that focuses on best practices for disaster risk reduction and resilience building.

Emergency Management Act

Climate preparedness and adaptation strategy

BC Climate Risk Assessment (scheduled to be released in late 2020)

*Tools (these are technical resources, so just focus on the overall framing and application)*

IDF curves

Fire Weather Index

*Adaptation examples in British Columbia*

Sea level rise guidance

Qualicum Beach Waterfront Plan

Vancouver Climate Change Adaptation Strategy

*Adaptation / Mitigation links*

IPCC 5th Assessment Report, Working Group II,  
Chapter 2 (focus on Section 2.5.1 – Assessing synergies  
and trade-offs with mitigation, including Figure 2-4)

## Course Schedule

Week	Module	Course Activities
Week 1	Course Introduction	<p>Welcome and Introduction</p> <ul style="list-style-type: none"> <li>• Introduction Activity</li> <li>• Synchronous Welcome Session</li> </ul>
	Module 1 – What's the problem?	<p>Module 1 Course Content</p> <p>Module 1 Activities</p> <ul style="list-style-type: none"> <li>• Module 1 Discussion Forum: Share an Example</li> <li>• Module 1 Discussion Forum: Data relevant to your region</li> <li>• Module 1 Discussion Forum: Recent example or news article</li> </ul>
	Module 2 – What's at stake?	<p>Module 2 Course Content</p> <p>Module 2 Activities</p> <ul style="list-style-type: none"> <li>• Module 2 Discussion Forum: Example of assessing or managing risk</li> <li>• Module 2 Discussion Forum: Key takeaways</li> <li>• Module 2 Discussion Forum: Risks related to future work</li> <li>• Module 2 Discussion Forum: Access to, translation or flow of climate information</li> </ul>
Week 2		

Week 3	Module 3 – What can we do?	<p>Module 3 Course Content</p> <p>Module 3 Activities</p> <ul style="list-style-type: none"><li>• Module 3 Discussion Forum: Regional Context</li><li>• Module 3 Discussion Forum: Sharing Insights</li><li>• Module 3 Discussion Forum: Tools or Indicators</li></ul>
Week 4	Module 4 – Knowledge and skills to practice	<p>Module 4 Overview</p> <p>Module 4 Activities</p> <ul style="list-style-type: none"><li>• Module 4 Activity</li><li>• Module 4 Discussion Forum: Submit Your Stories</li></ul>





# About Adaptation Learning Network



Welcome to the Adaptation Learning Network (ALN). This course is one of ten courses developed for working professionals. These courses are designed for people who are addressing climate adaptation risks and impacts in their communities and jobs.

## WHY DOES THIS MATTER?

Climate change adaptation requires expertise from many perspectives. The ALN is committed to connecting people, professional interests, and regions to advance skills, knowledge and solutions.

## JOIN THE NETWORK

To join the network, sign up for our monthly newsletter [here](#), and follow us on social media (Twitter, LinkedIn) to get adaptation news and hear about our latest course offerings and events.

## LEARN MORE

To learn more about the Adaptation Learning Network read this 5-minute introduction.

## MODULE 1

# MODULE 1: WHAT'S THE PROBLEM?

Welcome to Module 1. In this Module you'll have an opportunity to listen to more CBC's 2050: Degrees of Change podcasts, view some videos with Dr. Cohen and Denise Withers, and engage in some discussion activities. Before you begin, take a moment to read the Executive Summary of Canada's Changing Climate Report (2019). When you are ready, continue to Module 1.0: Overview to get started.

### *Learning Objectives*

This module will help you:

- Understand the evidence for our knowledge of historic climate trends for Canada
- Explore scenario-based projections of future climate change for Canada
- Become aware of the range of climate services available in Canada
- Consider examples of how climate change affects water resources, snow and ice cover, and oceans along Canada's coastlines

Canada's Changing Climate Report: Read the Executive Summary, and refer to the full report in case you would like to go into greater depth on particular topics.

- Executive Summary of Canada's Changing Climate Report (2019)
- Full report (includes link to individual chapters)

Pacific Climate Impacts Consortium (PCIC) is our regional climate service centre. PCIC conducts quantitative studies on the impacts of climate change and climate variability in the Pacific and Yukon region, providing regional climate information for planning.

The BC Government's Resources for Preparing and Adapting to Climate Change is a great resource for existing tools, climate change health facts, the recent BC Climate Risk Assessment, which we discuss in Module 2.

You may also want to dive into Canada's interactive Climate Atlas, where you can explore how various aspects of climate change are playing out in different regions of Canada and explore maps, graphs and climate data for provinces, local regions and cities across the country.

The Canadian Centre for Climate Services is another resource for climate resources, climate change concepts and trends, climate data, and has a climate-service support desk if you have further questions.





# Module 1.0: Overview

Let's get started. Module 1 consists of 3 sub-modules that cover the following topics:

- Core concepts of climate science
- Global context
- Greenhouse effect, global trend on GHG concentrations, global temperature trend
- Difference between weather, natural climate variability, climate change
- Weather, natural climate variability, & climate change each represent different time scales, from immediate short-term days and weeks, to years, to multiple-decades
- BC trends and scenarios
- Using climate change information in applications
- Sources of climate and climate change information
- Importance of tracking changes in water, snow and ice





# Module 1.1: Climate trends

Module 1.1 begins with a video-lecture on climate trends where Denise and I explore some of the fundamental concepts of climate science and an overview of how climate change is impacting Canada.

By the end of this module, you will be able to identify and understand the core climate science concepts, including the differences between adaptation and mitigation and how they overlap, the difference between weather and climate, and some of the current trends in what we are seeing, globally and regionally.

*Video attribution: "Climate Change Adaptation Fundamentals – Module 1.1 – Climate Trends" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

From the CBC podcast, here is an audio clip which features Trevor Murdock, a climate scientist with the Pacific Climate Impacts Consortium in Victoria, BC. In this clip, Trevor describes how climate change is affecting BC. The clip starts at 05:00 **Stop listening at 9:55 and return to this screen.**



*An interactive or media element has been excluded from this version of the text. You can view it online here: <https://pressbooks.bccampus.ca/climatechangeadaptationfundamentals/?p=47>*

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### *Discussion*

Share an example of climate change you've experienced in your own life or work. What happened? How did it affect you / others? What was the response?



# Module 1.2: Climate change scenarios

This next video lecture focuses on climate modelling and change scenarios. As with Module 1.1, view the video lecture below.

Video attribution: "Climate Change Adaptation Fundamentals – Module 1.2: Climate change scenarios" by Stewart Cohen, *Climate Change Fundamentals*, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.

Now Listen to the following excerpt from the CBC podcast 2050: Degrees of Change. Johanna Wagstaffe, Prof. Simon Donner, UBC, and Trevor Murdock, PCIC, on greenhouse gasses affecting the climate: (14:53) **Stop listening at 17:10 and return to this screen.**



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### Discussion

Review a news article and comment on its accuracy or find and share a recent example or news article about the development / use of climate models.

# Module 1.3: Climate change information for applications

This module provides an overview of climate services available in Canada, and examples of applications of climate change scenario information. Highlights from the 2019 federal government publication, Canada's Changing Climate Report, are also presented.

Start by watching the video lecture:

*Video attribution: "Climate Change Adaptation Fundamentals – Module 1..3: Climate change information for applications" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

After watching the video, listen to the following excerpts from the CBC podcast 2050: Degrees of Change.

- Johanna Wagstaffe and Prof. Stéphane Dery, UNBC, on precipitation and streamflow in the Fraser River Basin: (05:50) **Stop listening at 8:14 and return to this page.**
- Johanna Wagstaffe and Prof. Brian Menounous, UNBC, on glaciers: (19:02) **Stop listening at 22:49 and return to this page.**





An interactive or media element has been excluded from this version of the text. You can view it online here: <https://pressbooks.bccampus.ca/climatechangeadaptationfundamentals/?p=52>

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### *Discussion*

Check out 3 of the information sources referenced in the slides in Module 1.3 to see what data you can find that are relevant to your specific region.



# Module 1 Summary: Take Home Messages

This last video of Module 1 provides a high level summary of the key take home messages from this module.

*Video attribution: "Climate Change Adaptation Fundamentals – Module 1 Take home messages" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

Before moving on to Module 2, we invite you to consider the

implications of human-caused climate change to you in both your professional and personal lives. How would a rapidly warming climate affect your vision of your future, or the work that you currently do? How might it affect the future of your community?

If you are interested in more information on the basics of climate change and related tools and resources, we recommend exploring the following links:

Pacific Climate Impacts Consortium (PCIC) is our regional climate service centre. PCIC conducts quantitative studies on the impacts of climate change and climate variability in the Pacific and Yukon region, providing regional climate information for planning.

The BC Government's Resources for Preparing and Adapting to Climate Change is a great resource for existing tools, climate change health facts, the recent BC Climate Risk Assessment, which we discuss in Module 3.

You may also want to dive into Canada's interactive Climate Atlas, where you can explore how various aspects of climate change are playing out in different regions of Canada and explore maps, graphs and **climate** data for provinces, local regions and cities across the country.

And finally, the Canadian Centre for Climate Services is another resource for climate resources, climate change concepts and trends, climate data, and has a climate-service support desk if you have further questions.

## MODULE II

# MODULE 2: WHAT'S AT STAKE?

Welcome to Module 2. The focus of this module is on the projected risks of future climate change scenarios, including examples of how they have been determined. You will have the opportunity to listen to additional clips from CBC's 2050: Degrees of Change podcasts, and to hear from Dr. Johanna Wolf, Senior Policy Analyst with the BC Climate Action Secretariat. Dr. Wolf led the Preliminary Strategic Climate Risk Assessment for British Columbia. When you are ready, continue to Module 2 Overview to get started.

### *Learning Objectives*

This module will help you

- Understand the outcomes of the review of the 2017 wildfire season in British Columbia
- Consider examples of expert judgement of climate change risk for Canada, and for British Columbia, including ratings of likelihood, consequence, and adaptation potential
- Explore aspects of the climate change information supply chain

## *Readings and Resources*

Read sections from the following:

Abbott and Chapman – sections on the 2017 wildfire

Canada's Changing Climate Report – Executive Summary

Canada's Changing Climate Report – Chapter 8

IPCC 5<sup>th</sup> Assessment, Working Group II, Summary for Policymakers (SPM)

Council of Canadian Academies, Canada's Top Climate Change Risks – method and summary of results

BC Government, Preliminary Strategic Climate Risk Assessment for British Columbia – method and summary of results

Cohen, From observer to extension agent – using research experiences to enable proactive responses to climate change

# Module 2: Overview

Let's get started. Module 2 consists of 5 sub-modules that cover the following topics:

- The 2017 wildfire season in British Columbia; impacts and response
- Framing of risk in the context of climate change
- The role of expert judgement in assessing climate change risk
- Climate change risk assessment for Canada, including ratings of adaptation potential
- Climate change risk assessment for British Columbia
- The climate change information supply chain, and the role of practitioners within it





# Module 2.0: Wildfires

With Module 2 we move from understanding the basic concepts of climate science, to exploring what climate change means to us in terms of risks and impacts – what is at stake. Let's begin with this video lecture:

*Video attribution: "Climate Change Adaptation Fundamentals – Module 2.0: Wildfires" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

The climate risks and impacts we face change from geographic

region to region, and climate adaptation requires understanding these regional impacts and shaping adaptation measures to those specific impacts and contexts. One of the climate risks we face in BC is an increase in the length of the wildfire season and the severity and frequency of wildfire events. In this clip from the CBC podcast 2050: Degrees of Change, forest fire ecologist Robert Gray discusses the impacts of climate change on BC's forests

- Start at 03:00 and **Stop listening at 7:09 and return to this screen.**



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We have added a brief video clip here to provide an update on the 2019-2020 Australia bushfire season.

Video attribution: "Climate Change Adaptation Fundamentals – Module 2.0: Wildfires Updates" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.



# Module 2.1:

## Understanding risk and impact

Wildfire risks are only one of the risks we face in a climate changed future. In this next video lecture, we explore why it is important for professionals thinking about adaptation to understand how climate change is resulting in changing climate statistics, and the influence of those changes on the assessment of future climate risks and their impacts.

To do this, we return to the global environment to explore the trends in weather and climate catastrophes and the projected changes in climate extremes based on low and high emission scenarios. We will explore climate change scenarios for BC, and some of the findings from the recent climate risk assessment for our province.

With climate change comes the need to focus attention not only on understanding and planning for individual risks, such as wildfires, but also on compound risks — where two or more events can co-occur and interact. In this way, climate change is influencing not only the nature of the risks we face, but also how practitioners will need to adapt their planning and decision making to account for compound and complex scenarios involving multiple environmental and social factors and uncertainty.

*Video attribution: "Climate Change Adaptation Fundamentals – Module 2.1: Understanding risk and impact" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

### *Discussion*

Share an example of how you've assessed or managed risk in the past. Review the posts of others and share

insights about how they might do things differently in future.





# Module 2.2: Canada's top climate change risks

Building on the base of Module 2.1, we now explore in greater depth some of Canada's top projected climate change risks and what this means for potential climate adaptation.

Lets start by listening to the following video lecture:

*Video attribution: "Climate Change Adaptation Fundamentals – Module 2.2: Canada's top climate change risks" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

(Those interested in learning more about these risks, can click on this link to the full Canadian Council of Academies Canada's Top Climate Change Risk report.)

### *Discussion*

Review Module 2.2 — slide 7 share your thoughts about how the findings fit with your current experience and assessment in your region today?

# Module 2.3: BC's top climate change risks

We take a dive into the Strategic Climate Risk Assessment for British Columbia and its implications for the province:

*Video attribution: "Climate Change Adaptation Fundamentals – Module 2.3: BC's top climate change risks" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

The risk profile this report provides is important but it is still

very conceptual. What do these risks mean on the ground? To explore and humanize these risks we return to CBC Podcast 2050: Degrees of Change News Montage..

In this clip we hear from Emily McNair, part of the Climate Action Initiative working with farmers in BC to plan for climate changes, and Lydia Ryall, whose farm sits on Westham Island in the Fraser River Delta. Her farm is threatened by sea level rise the increasing risk of what is known as a salt wedge, or the influx of salt water into the fresh water she uses for irrigation. Start listening at 5:11. Stop listening at 7:45 and return here. You may listen here or on the widget below.



*An interactive or media element has been excluded from this version of the text. You can view it online here: <https://pressbooks.bccampus.ca/climatechangeadaptationfundamentals/?p=67>*

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### *Discussion*

Review the areas of risk in Module 2.3 — slide 7 and identify those that relate to your future work.

# Module 2.4: Climate change information supply chain

So the risks we face in the changing climate are diverse, complex and characterized by uncertainty. In the face of this complexity, knowledge translation and knowledge sharing between climate scientists – the producers of climate information – and professionals such as yourselves – the consumers of climate information – is critical.

In Module 1, we explored some examples of the kinds of information being shared by two of Canada's key climate knowledge producers – the Pacific Climate Impacts Consortium or PCIC for short, and the Quebec-based Ouranos. Here in Module 2.4, we shall consider the “supply chain” of climate change information, and the role of practitioners within it:

*Video attribution: "Climate Change Adaptation Fundamentals – Module 2.4: Climate change information supply chain" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

### *Discussion*

Identify one concrete thing you could do in your work to improve access to, translation or flow of climate information.

## Preparing for Module 3

In Module 3, you will see presentations and resources on both Disaster Risk Reduction (DRR) and climate change adaptation. To prepare for the next Module, review the Module 3 Learning Goals and take a look at the Readings and Resources.





## MODULE III

# MODULE 3: WHAT CAN WE DO?

Welcome to Module 3. Here, we consider how planned adaptation to future climate change differs from adapting on the basis of past experience. Several adaptation cases from various communities in British Columbia are described. We will also consider the climate change information supply chain, and the role of practitioners within it. When you are ready, click on Module 3 Overview to get started.

### *Learning Objectives*

This module will help you:

- Understand global-scale climate change risks, and why they matter
- Explore some tools that can enable practitioners to assess and plan for flood and wildfire risks
- Consider examples of proactive adaptation being planned or implemented in British Columbia
- Understand potential synergies and trade-offs between climate change adaptation and mitigation of greenhouse gas emissions

## *Reading & Resources*

Sendai Framework for Disaster Risk Reduction A global, non-binding agreement followed by 187 countries that focuses on best practices for disaster risk reduction and resilience building.

Emergency Management Act

Climate preparedness and adaptation strategy

BC Climate Risk Assessment (scheduled to be released in late 2020)

*Tools (these are technical resources, so just focus on the overall framing and application)*

IDF curves

Fire Weather Index

*Adaptation examples in British Columbia*

Sea level rise guidance

Qualicum Beach Waterfront Plan

Vancouver Climate Change Adaptation Strategy

## *Adaptation / Mitigation links*

IPCC 5th Assessment Report, Working Group II,  
Chapter 2 (focus on Section 2.5.1 – Assessing synergies  
and trade-offs with mitigation, including Figure 2-4)



# Module 3.0: Overview

In the previous modules we have explored some of the ways in which climate change is affecting us regionally, including identifying and discussing some of the climate risks we face here in BC. In this module, we now move on to explore what we can do about those risks. Topics covered include:

- Links between Disaster Risk Reduction and climate change adaptation
- examples of tools for assessing climate change risk to support adaptation planning
- examples of ongoing adaptation activities in British Columbia
- links between adaptation and mitigation of greenhouse gas emissions



# Module 3.1: What can we do?

Having explored the profile of risks we face here in BC and in Canada, it is now time to focus on what we can do about those risks. Reducing the risks of catastrophic climate related events and disasters is a priority not only for those focusing on climate adaptation, but also for professionals working in emergency management. In fact, there are many overlaps between disaster risk reduction (DRR) and climate change adaptation (CCA). Both focus on reducing risks and associated vulnerabilities, and increasing resilience. Just as our emissions reduction goals are being shaped by climate science and the Paris Agreement, our disaster risk reduction goals in Canada are being guided by the Sendai Framework for Disaster Risk Reduction – a global, non-binding agreement signed by 187 countries that focuses on best practices for disaster risk reduction (DRR) and resilience building.

In this first video, we hear from Dr. Matt Godsoe, Director with Public Safety Canada, the federal agency responsible for emergency and disaster management. Dr. Godsoe shares his research on the current and future state of disaster risk reduction in Canada and what the current trends suggest about the future human, economic and environmental costs of disasters and our capacity for resilience:

The provincial government is currently revising the Emergency Management Act, to better reflect the DRR goals of the Sendai Framework's and support a more fulsome integration and consideration of indigenous knowledge and rights, and climate change.

At the same time, the province is also crafting a new climate preparedness and adaptation strategy to better reflect the climate risks identified in the BC Climate Risk Assessment discussed in Module 2. These separate but related initiatives highlight the need for coordinated planning and cross sector collaboration. In the following video lecture we will explore some of the challenges and opportunities for such planning,



including some examples currently underway in British Columbia.

*Video attribution: "Climate Change Adaptation Fundamentals – Module 3.1: What can we do?" by Stewart Cohen, Climate Change Fundamentals, Adaptation Learning Network is licensed under CC BY 4.0. The images used in the slides in the video are **not** CC BY.*

Now let's return to the CBC podcast 2050: Degrees of Change to get a sense of the range of adaptation already underway in BC. We begin with a clip featuring Doug Smith, the City of Vancouver's Director of Sustainability talking about the Olympic Village neighbourhood in Vancouver, and the implications of sea level rise for that neighbourhood and the city more generally:

Start listening at 5:15 and **Stop listening at 5:57 and return to this screen.**



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*Podcast attribution: This podcast is © CBC/Radio-Canada 2021. All rights reserved. You may also find and listen to this podcast on their website.*

The next clip features John Vanderden, a Vancouver based engineer discussing dyke adaptations along the Fraser River as another approach to adapting to sea level rise:

Start listening at 20:30 and **Stop listening at 23:57 and return to this screen.**



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*Podcast attribution: This podcast is © CBC/Radio-Canada 2021. All rights reserved. You may also find and listen to this podcast on their website.*

The final podcast clip features forest-fire ecologist Robert Gray

discussing the ways we will need to adapt to support forests being resilient to forest fires and drought in the future:

Start listening at 8:14 and **Stop listening at 10:47 and return to this screen.**



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### *Discussion*

Share 1-2 tools or indicators you currently use in your adaptation work, along with a brief example of how you've put them into practice.



# Module 3.2: Adaptation examples from BC

With those adaptation examples from Module 3.1 in mind, we now take a deeper dive into adaptation:

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### Activity

Pick an example from this section (or one from your own region). Share 1-2 insights about what you think works well with this adaptation, and how it could be even better.

# Module 3.3: Adaptation - mitigation linkages and summary

In this final video lecture of Module 3, we bring everything together, discussing the linkages between climate change adaptation and climate change mitigation, exploring the synergies (co-benefits) and trade-offs that these two sides of climate action present.

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### *Discussion*

Think about your own regional context and pick one example of climate change adaptation that will be necessary in the future that you can work on in the next module.

## Preparing for Module 4

In Module 4, learners will have an opportunity to explore how information about human-caused climate change could be applied within their own field of practice by creating and sharing a “future story”. More detail is provided in Module 4 Assignment.

To prepare for the next and final Module, review the Module 4 Learning Goals.



## MODULE IV

# MODULE 4: KNOWLEDGE AND SKILLS TO PRACTICE

Welcome to Module 4 the final module in this course. The overarching goal of this course is to support your capacity to incorporate adaptation into the work you do. So, we now shift from learning about climate change, climate risk, and climate adaption, to a reflective activity designed to help each of you synthesize what you've learned and explore ways to put your new knowledge and skills into practice.

The Module 4 activity focuses on crafting a future adaptation story that is relevant to you and your profession and professional goals.

### *Learning Objectives*

In Module 4, you're going to use your own work background, and, reflecting on the previous Modules, create a story about how you might design a climate change adaptation activity that could be carried out from within your field of practice.

This experience is something that you can take with you upon completion of this course.



# Module 4: Activity

As a way to pull together all the threads of the previous module, we invite you to use your time during this final week of the course to create a future story\* about how you might design a climate change adaptation project in your region / domain. Your story could be anything from a one-page outline, to a flow chart, to a short slide deck. The idea is to take some time to think about a challenge you're currently facing or might face in your work, and explore the steps you could take to apply a climate change adaptation lens to that work.

Over the course of the week, you'll have an opportunity to discuss your future project with the instructor and your classmates. You'll also be invited to share it in a discussion forum, and offer feedback on the stories of the other participants. How much you participate is up to you.

When preparing your story, it might be helpful to ensure it describes:

- The specific challenge or opportunity you'd like to tackle.
- The key steps you know you'd need to take to succeed.
- Expected obstacles you don't yet know how to overcome.
- Stakeholders, collaborators, regulators and other people you'd need to work with.
- Required resources to get the job done.
- The ideal outcome, along with measures of success.

When describing how you'll approach solving the problem, it may be helpful to consider some of the core concepts we've covered in the course, such as:

- Risk assessment.

- Compound risks.
- Impact.
- Access to data.
- Information supply chains.
- Expert judgement.
- Historic vs future perspectives.
- Mitigation-adaptation interactions.

Again, your story can take any form you choose: text, audio, photos, video or even a webpage. Please don't worry about the packaging of your story; the purpose is to see what you propose to do, how you might do it, and what might get in your way. You are encouraged to explore something that is relevant to you – a project that's on your desk now, or something that may come up in the near future, so that this exercise has real value for you.

\*Note that every story describes the experience of a hero as s/he solves a problem. While most stories are about things that have already happened, future stories simply describe proposed / desired approaches to solving problems in the future. In many ways, future stories are strategies.

### *Activity Schedule*

Here's a schedule of suggested steps to help you complete the activity. Note that all are optional; however, you are encouraged to participate in all the steps to maximize the learning benefit. *Note: this is a sample of how the activity was run in a facilitated offering of this course.*

#### **Monday**

Sketch out your proposed project, including known and unknown activities and obstacles. Attend a synchronous web conferencing session.

### **Tuesday**

Participate in a live chat with the instructor and classmates to pitch / discuss your idea.

### **Wednesday**

Prepare your story, referencing the two bulleted lists on the Module 4 Activity page to guide your content. Don't be afraid to identify gaps in available skills, resources, data, knowledge that will need to be filled. This is a learning exercise – it's okay if you don't have all the answers!

### **Thursday**

Submit your story to the Module 4 Discussion Forum. Include the title of your project and your name in the Subject Line of your post. (Eg. Stewart's Snowcap Retention Project).

### **Friday**

In the same Module 4 Discussion Forum, review and share insights about two of your classmates' stories. Also – check the Announcements to read Dr. Cohen's final course summary, including his thoughts about what the assignment revealed and future opportunities for learning.

Take some time to celebrate your efforts and to reflect on the course.