Pacific Institute
for Climate Solutions
Knowledge. Insight. Action.

Climate Insights 101 Questions and Discussion Points
Module 1, Lesson 4: An Introduction to Climate Modelling

Available at http://pics.uvic.ca/education/climate-insights-101

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Questions:

Describe climate models: how do they help us understand the past and project into the future.

What factors do climate modellers consider to explain the climate system's large-scale features, variability and response to external pressures or forcings?

What are "parameterizations" and why are they a source of uncertainty in climate solutions?

Why are climate models like a "virtual earth"?

How is climate modelling different from weather forecasting?

What is the difference between natural internal patterns of climate variability and fingerprints?

Give examples of outside influences on the climate that climate modelling takes into consideration?

What are "forcings"? (Ref. slide 2) and what are "forcing agents"? (Ref. slide 8)

Experts in climate modelling are careful to say they are "projecting" long-term future climate – not – "predicting". How would you articulate the difference between the two words? Use each in a sentence. (Ref. slide 9)

The interaction between the land surface and the atmosphere is an important part of the climate system. What are some examples of the aspects of land surface processes that are considered in climate models? (Ref. slide 4)

What are "climate scenarios" as the word is used by climate scientists? (Ref. slide 10)

One of the scenarios in the SRES report refers to a “heterogeneous” world. What does this mean? (Ref. slide 10)

What are “growing degree days”? (Ref. slide 14)

Give some examples of outside influences on the climate that climate modelling takes into consideration? (Ref. slide 2)

What are some of the key climate processes that can be represented mathematically for modelling climate? (Ref. slide 3)

In the slide describing observed global mean surface temperature anomalies what do the ‘observed’ temperatures show? (Ref. slide 8)

What is the key bit of information without which climate models cannot reproduce accurately? (Ref. slide 8)

On a continental level which years in the 20th century stand out as being exceptionally warm? (Ref. slide 8)

What special challenges do modelling at the smaller, regional level, give? (Ref. slide 8)

A “thought experiment” is described in some detail in the section about possible temperature increases. What was the outcome for temperature as this experiment revealed? (Ref. slide 11)

For Discussion:

There are a growing number of climate modelling centres in the world. Identify where each is on a map and discuss why each is located in those particular parts of the world? For example, how many are located in university towns? Is this a coincidence – or not?

What are some possible outcomes as far as precipitation in BC goes – with respect to planning for the future? (Ref. slide 12)

Bringing the precipitation issue closer to home, what is the challenge for a city or town’s storm drain’s system designed for locations with projected times of more extreme rain? Has your town or neighbourhood experienced problems with storm drains during severe rainstorms? What was the impact on you? (Ref. slides 12, 13)

Dealing with change usually costs and no one likes paying higher taxes. In the case of storm drains do we pay now, to prepare for the future? Or “then”, to repair damage done to old systems? Discuss. (Ref. slides 12, 13)

If you live in an agricultural area you are probably even more aware than others of how the weather affects crops. For example a freak hailstorm can wipe out an orchard of cherries. But as we’ve seen scientists are using modelling to project future climate that might affect farmers. Find out the number of “growing degree days” that farmers in your nearest farm area, need on average, in a year to produce a good harvest of [insert a typical local crop] and discuss the implications of that? (Ref. slide 14)