



Academic Launchpad

*Your path to success...*

# BROCHURE

APPLIED CLIMATE MODELLING AND  
CLIMATE RISK ACCELERATOR





**Academic Launchpad**  
*Your path to success...*

# Applied Climate Modelling and Climate Risk Accelerator

A practical training program for professionals and researchers who need real, applicable expertise in climate science, climate modelling, climate risk, and Python-based climate data analysis.



**16**

Live sessions



**8**

Conceptual  
modules



**8**

Hands-on  
Python modules



**0**

Prior coding  
experience  
needed



Climate  
modelling



Climate  
risk



CMIP  
datasets



Python for  
climate



Uncertainty  
estimation



Beginner to  
advanced



Led by

**Dr. Rishav Goyal**

Climate Scientist | PhD, UNSW | Recipient of the Uwe Radok Award



# THE PROBLEM



## Climate expertise is in demand. Practical training is hard to find.

Climate models underpin risk analysis, infrastructure planning, policy, insurance, and sustainability decisions worldwide. Yet most training stops at theory — leaving professionals and researchers without the practical skills to work with climate data, interpret projections correctly, or apply models to real problems.



Unsure how to choose the right climate dataset for a specific application



Struggle to interpret uncertainty maps and ensemble outputs correctly



No hands-on experience running climate analyses or working with CMIP data



Difficulty applying Python to real climate science workflows



Not confident in translating model outputs into decisions and action



This program bridges the gap between theory and practice — combining strong conceptual foundations with hands-on tools used daily in research and industry.





# WHO SHOULD ENROL

## Built for those who need climate skills that actually work.

This program is designed for working professionals operating at the intersection of climate science and decision-making, and for researchers who need a stronger technical foundation in climate data and modelling.



### Professionals

- Climate and sustainability consultants
- Government and policy professionals
- Engineers and infrastructure planners
- Environmental and risk analysts
- Insurance and finance professionals
- Water, energy, and resource managers
- Urban and regional planners
- ESG and investment professionals



### Researchers

- PhD and postgraduate students
- Early-career researchers
- Honours and Masters students
- University students in STEM



No prior Python or programming experience required. The program builds from the ground up — all you need is curiosity and a willingness to engage with real data.



# WHAT YOU'LL WALK AWAY WITH

## Skills you can apply from day one.

By the end of the program, participants will have both the conceptual understanding and the technical toolkit to work confidently with climate data, models, and risk assessments in professional and research settings.



Understand how climate models are built, applied, and interpreted



Work confidently with CMIP datasets and reanalysis products



Interpret uncertainty maps, ensemble outputs, and climate projections



Write Python code for climate data analysis and visualisation



Conduct scientifically robust climate impact assessments



Apply climate risk methodologies used in consulting and policy



Run simplified climate model simulations and interpret outputs



Communicate climate science clearly to technical and non-technical audiences





## YOUR INSTRUCTOR



### Dr. Rishav Goyal

Climate Scientist & Senior Civil Servant,  
NSW Government, Australia

PhD, University of New South Wales  
(UNSW)

Dr. Rishav Goyal is a climate scientist with deep expertise spanning climate modelling, variability, uncertainty estimation, and applied climate risk. He completed his PhD at the University of New South Wales (UNSW), Australia, supported by the prestigious Scientia PhD Scholarship, and has held multiple research fellowships throughout his career. Beyond research, Dr. Goyal works as a senior civil servant with the NSW Government — giving him a rare combination of scientific depth and real-world policy and applications experience. He is passionate about helping students and professionals develop practical expertise that is increasingly essential in today's climate-aware economy.



#### Uwe Radok Award

Awarded annually to one  
climate scientist in Australia



#### UNSW Chancellor's Award

University of New South Wales,  
Australia



#### Director's Medal & Gold Medal

IIT BBS, India — top  
graduating student



#### Scientia PhD Scholarship

UNSW's most prestigious  
research scholarship



*I've spent my career working at the intersection of climate science and real-world application. This program is everything I wish I'd had access to earlier — practical, rigorous, and directly applicable to the work that matters.*



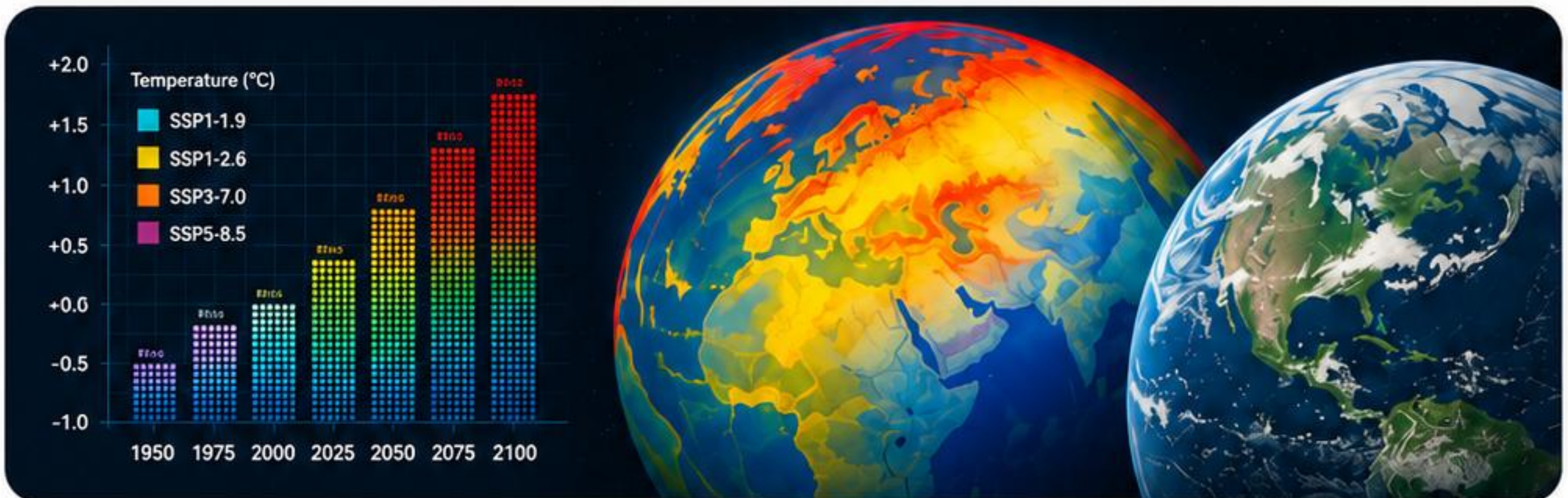


## Session 1

# Introduction to Climate Modelling

“Most people only know half the story.”

Climate models are far more than warming forecasts. They power risk assessments, policy decisions, and infrastructure planning worldwide. This session gives you the full picture — and the foundation you need for everything that follows.



## YOU'LL LEARN TO

- ✓ Understand how climate models are built, validated, and applied
- ✓ Recognise the role of physics, observations, and numerical simulation
- ✓ Identify how models drive risk, adaptation, and policy decisions
- ✓ Navigate the full program structure with confidence



Build the conceptual foundation that makes every subsequent session click into place.



Session 2

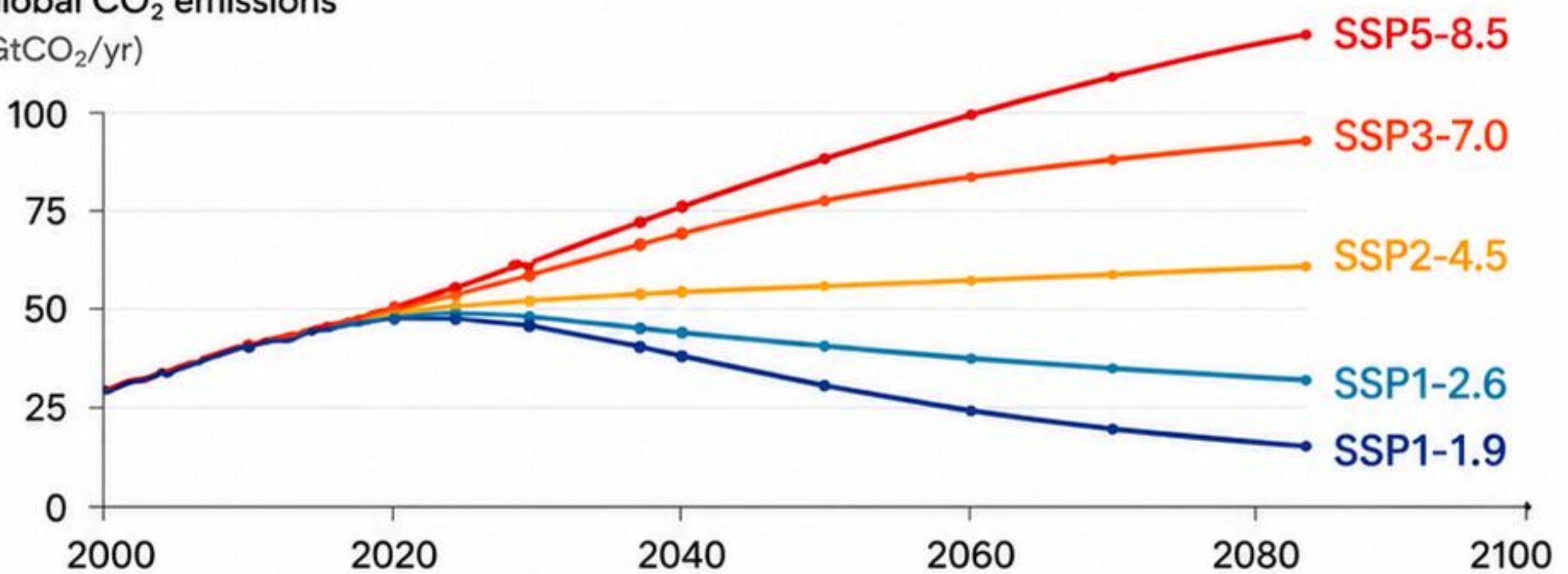
# Emissions Scenarios & Radiative Forcing

“RCPs, SSPs, CMIP7 — decoded.”

Future climate projections hinge entirely on scenarios. In this session, you'll learn how emissions scenarios and radiative forcing work — and why they shape every climate outcome.



Global CO<sub>2</sub> emissions  
(GtCO<sub>2</sub>/yr)



## YOU'LL LEARN TO

- ✓ Compare RCPs and SSPs, and understand their assumptions
- ✓ Understand radiative forcing and greenhouse gas pathways
- ✓ Evaluate scenario suitability for different applications
- ✓ Interpret scenario outputs in the context of risk and planning



Learn to think in scenarios — the backbone of climate impact studies and decision-making.



**Session 3**

# Understanding Climate Models (GCMs, RCMs, ESMs)

“GCMs, RCMs, ESMs — what’s the difference?”

From global to regional to Earth system models — this session clarifies how each model works, what they simulate, and how they are used in practice.



**GCM**



Coarse global resolution

**RCM**



Higher regional resolution

**ESM**



Earth system components

## YOU’LL LEARN TO

- ✓ Distinguish between GCMs, RCMs, and ESMs
- ✓ Understand model components and Earth system interactions
- ✓ Recognise model strengths, limitations, and appropriate use
- ✓ Select the right model for your research or application



Get clarity on models — so you can choose, interpret, and apply them with confidence.



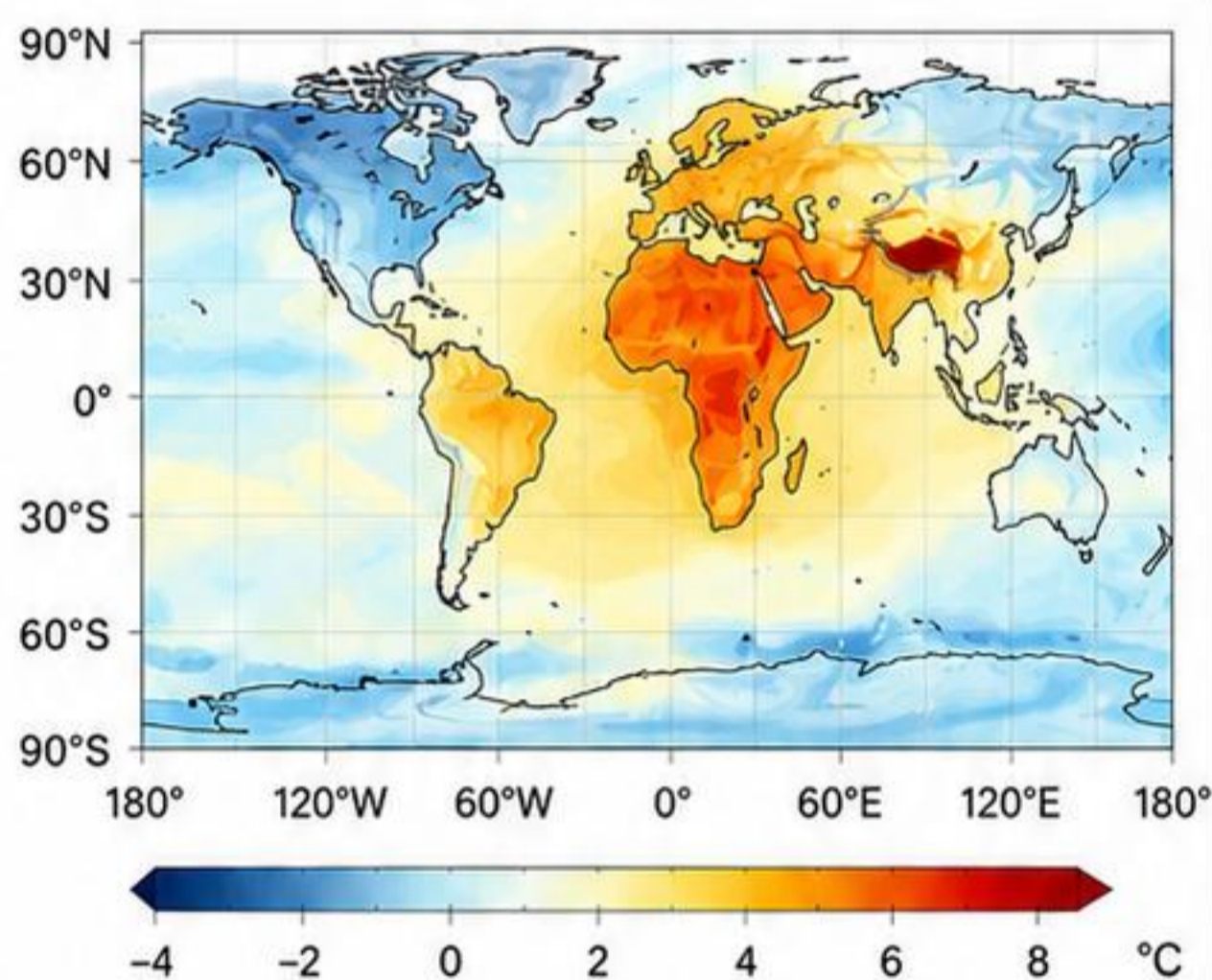
Session 4

# Climate Data & CMIP Datasets

“CMIP data: the gold standard.”

CMIP datasets are the foundation of modern climate research. This session gives you a practical guide to CMIP6/CMIP7 data structure, variables, and access.

CMIP6 Data Structure



CMIP6 Data Table (Example)

Variable	Frequency	Table ID	Institution ID	Source ID
tas	daily	Amon	ACCESS-ESM1-5	r1i1p1f1
pr	daily	Amon	ACCESS-ESM1-5	r1i1p1f1
tas	daily	Amon	IPSL-CM6A-LR	r1i1p1f1
pr	daily	Amon	IPSL-CM6A-LR	r1i1p1f1
tos	daily	Omon	MRI-ESM2-0	r1i1p1f1
...	...	...	...	...

## YOU'LL LEARN TO

- ✓ Navigate CMIP6/CMIP7 data portals and archives
- ✓ Understand data format, NetCDF, and metadata
- ✓ Select variables, experiments, and time periods
- ✓ Organise and manage large climate datasets efficiently



Work confidently with the most widely used climate datasets in the world.



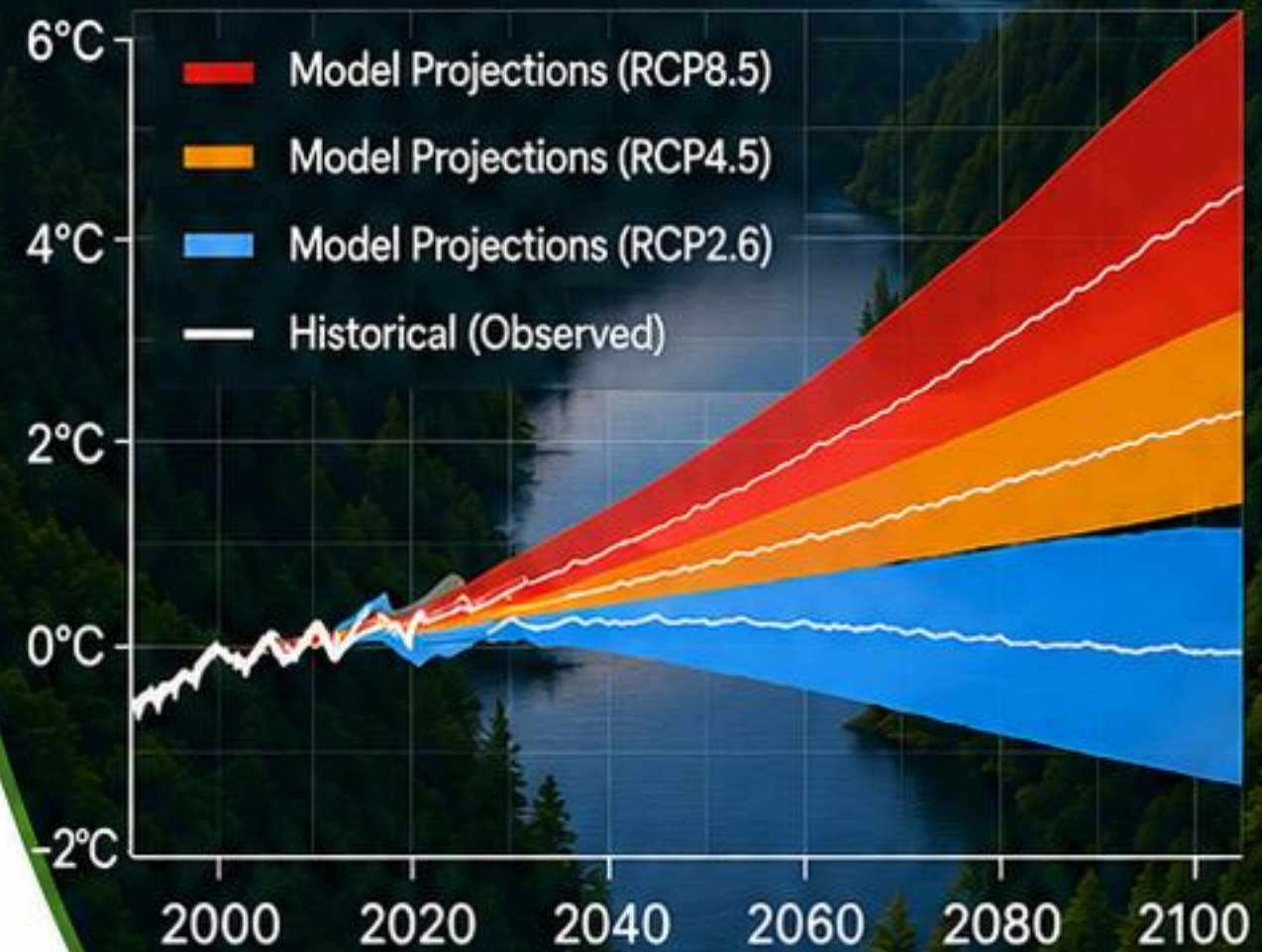
## Session 5

# Climate Change & Uncertainty Estimation

**“You can’t plan for what you can’t quantify.”**

Every climate projection carries uncertainty. This session shows you how to measure it, interpret it, and communicate it with clarity and confidence.

Global Mean Temperature Anomaly (°C) relative to 1986–2005



## YOU’LL LEARN TO



Understand sources of uncertainty in climate projections



Use ensemble methods to quantify uncertainty



Calculate confidence intervals and probability ranges



Interpret uncertainty in the context of risk and decisions



Communicate uncertainty clearly to technical and non-technical audiences



Quantify uncertainty. Reduce risk.  
Make smarter climate-informed decisions.



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**Session 6**

# Hands-On Climate Modelling

*“Stop reading about climate models. Run one.”*



Set up and run a 1-D climate model simulation from scratch



Design and test custom future emissions scenarios



Investigate climate sensitivity and feedback mechanisms



Interpret your own model outputs with scientific rigour



Experience is the best teacher.  
Model today. Lead tomorrow.



**Session 7**

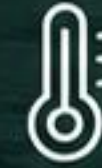
# Climate Impact Assessments

**“Understand the impacts.  
Prepare for the future.”**

Learn how climate change affects ecosystems, communities, and economies — and how to assess vulnerabilities and opportunities for adaptation.



Coastal  
Inundation



Extreme  
Heat



Agricultural  
Stress



Water  
Scarcity

## YOU'LL LEARN TO



Assess climate impacts across sectors and systems



Identify vulnerabilities and exposure



Use impact assessment frameworks and tools



Evaluate adaptation and resilience strategies



Assessment is the first step to adaptation.  
Understand today. Prepare for tomorrow.



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**Session 8**

# Climate Risk, Statistics & Scientific Interpretation

**“From data to decisions.  
From statistics to solutions.”**

Master the tools and thinking needed to quantify climate risk, analyse data, and draw meaningful, science-based conclusions.



## YOU'LL LEARN TO



Apply statistical methods to climate data



Quantify and analyse climate risk and uncertainty



Interpret trends, variability, and extremes



Communicate scientific findings with clarity and rigour



Numbers tell the story.  
Interpret it right. Make it count.



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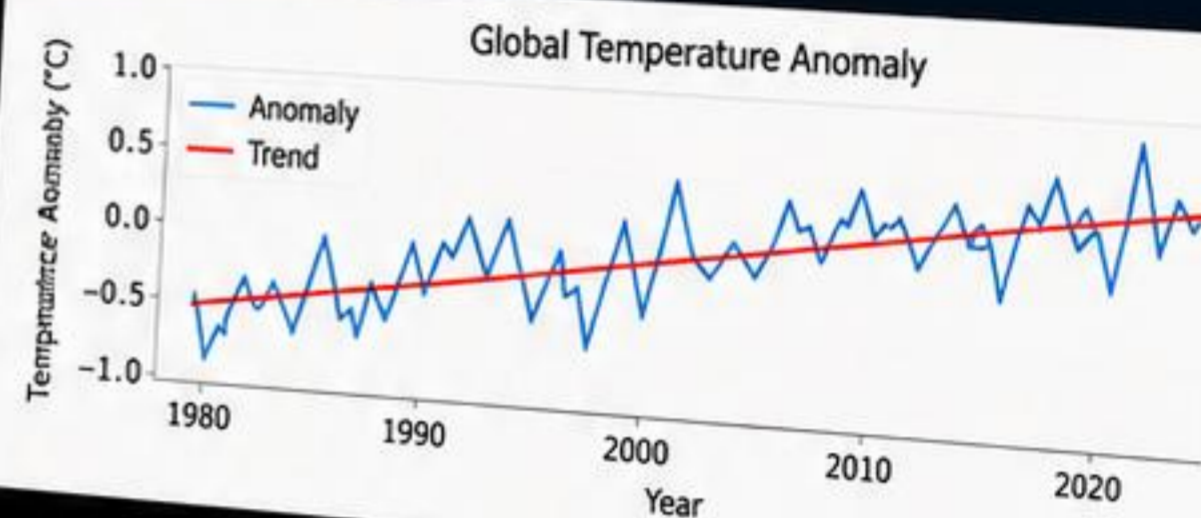
Sessions 9–10

# Python Foundations for Climate Science

Zero to ready — in two sessions.

No prior programming experience required. These sessions build your Python foundations from scratch and get you ready to work with real climate data.

```
1 import numpy as np
2 import pandas as pd
3 import matplotlib.pyplot as plt
4
5 # Example: Temperature trend
6 years = np.arange(1980, 2025)
7 temp_anomaly = np.random.normal(0, 0.1, len(years))
8 trend = np.polyfit(years, temp_anomaly, 1)
9
10 plt.figure(figsize=(8,4))
11 plt.plot(years, temp_anomaly, label='Anomaly')
12 plt.plot(years, np.polyval(trend, years), 'r', label='Trend')
13
14 plt.xlabel('Year')
15 plt.ylabel('Temperature Anomaly (°C)')
15 plt.title('Global Temperature Anomaly')
16 plt.legend()
17 plt.tight_layout()
18 plt.show()
18
```



## YOU'LL LEARN TO



Write clean, efficient Python code



Work with data types, functions, and loops



Use NumPy for numerical computing



Visualise data with Matplotlib



Build a solid Python workflow for climate applications



Strong code. Stronger insights.  
Python is your climate superpower.



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Sessions 11–12

# Climate Data Analysis Using Python

Turn data into understanding.  
Turn understanding into action.

These sessions move straight into hands-on climate data analysis using the same datasets found in research and industry. You'll clean, explore, and visualise data — then extract insights that matter.

## YOU'LL LEARN TO



Load and explore climate datasets



Clean and preprocess climate data



Analyse trends, variability, and patterns



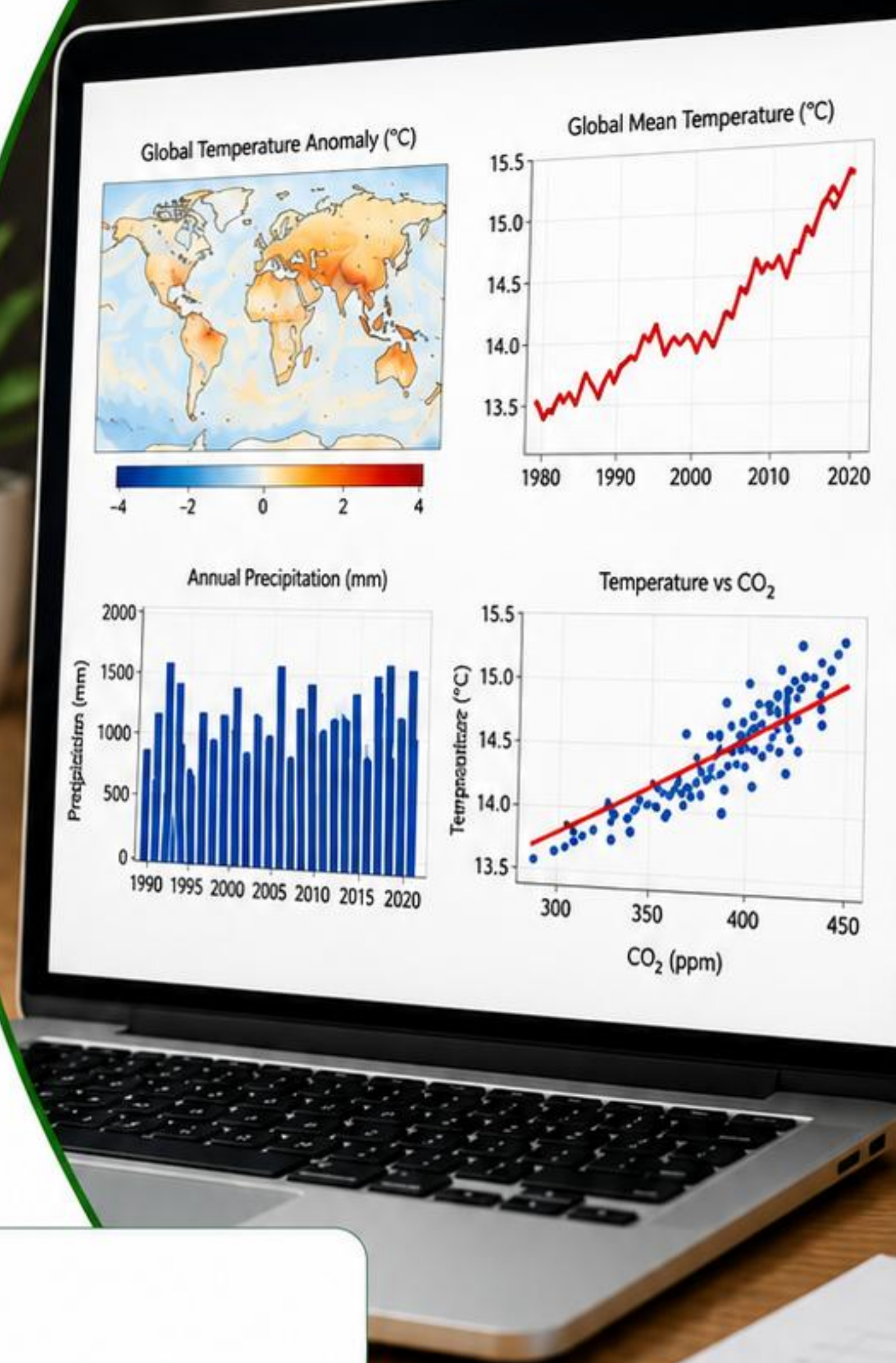
Create meaningful visualisations



Draw insights and communicate findings



Good data. Better analysis.  
Smarter decisions for a changing world.





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Sessions 13-14

# Advanced Climate Analysis & Visualisation

Turn complex data into clear, defensible conclusions.

These sessions introduce advanced climate analysis techniques and visualisation strategies used by researchers and professionals worldwide.

## YOU'LL LEARN TO



Conduct correlation, regression, and climate variability analyses



Compare and interpret multi-model ensemble outputs



Map and visualise climate data spatially at scale



Interpret statistical outputs with scientific accuracy

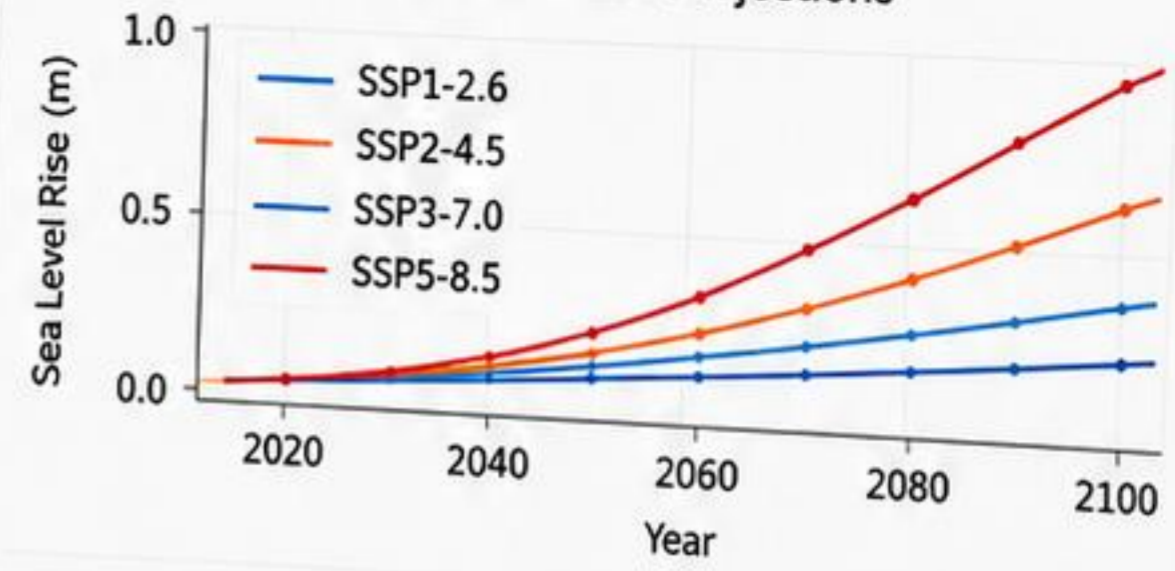


Turn complex analysis into clear, actionable insights

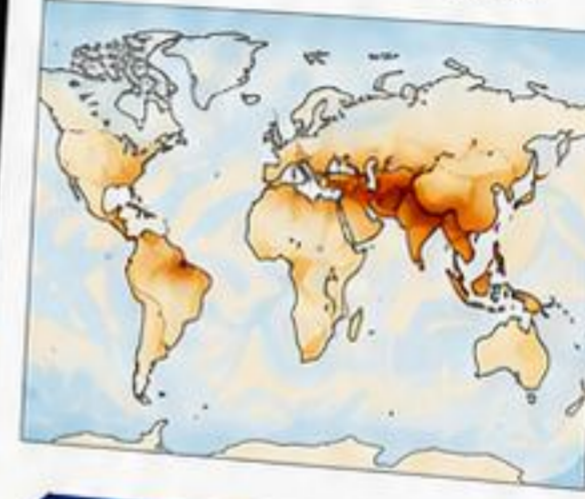


Deeper analysis. Clearer insights.  
Stronger decisions.

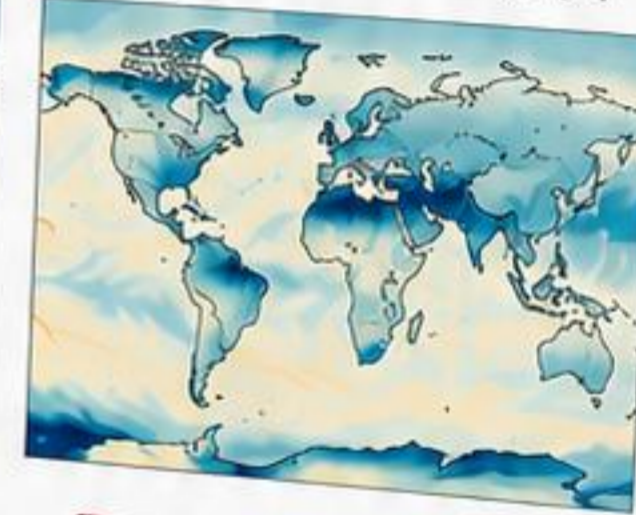
Sea Level Rise Projections



Temperature Anomaly (°C)



Global Precipitation Change (%)





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Sessions 15–16

## Applied Climate Risk & Advanced Workflows

Real-world skills for a high-demand field.

These sessions prepare you to tackle real climate challenges with advanced tools, workflows, and professional best practices.



### YOU'LL LEARN TO



Execute applied climate risk analysis from start to finish



Handle multi-variable datasets and uncertainty with confidence



Interpret and communicate future climate projections effectively



Apply best practices used in professional climate science and consulting



Build advanced workflows that save time and improve results



Advanced tools. Real impact.  
Solve today's climate challenges.



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# Applications Now Open



Small Cohort. High Interaction.



Direct interaction  
with instructor



Individual  
feedback



Practical workflow  
support



Real-world  
climate datasets

LIMITED SEATS AVAILABLE

## Register Now



[www.alclasses.com/general-7](http://www.alclasses.com/general-7)



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