



My Climate Copilot: An Application of NLP in Climate Adaptation for Agriculture¹

Vincent Nguyen, Sarvnaz Karimi, Willow Hallgren, Ashley Harkin (BOM), Mahesh Prakesh

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[1] Vincent Nguyen, Sarvnaz Karimi, Willow Hallgren, Ashley Harkin, and Mahesh Prakesh. 2024. [My Climate Advisor: An Application of NLP in Climate Adaptation for Agriculture](#). In *Proceedings of the 1st Workshop on Natural Language Processing Meets Climate Change (ClimateNLP 2024)*, pages 27–45, Bangkok, Thailand. Association for Computational Linguistics.

Climate Change & Agriculture



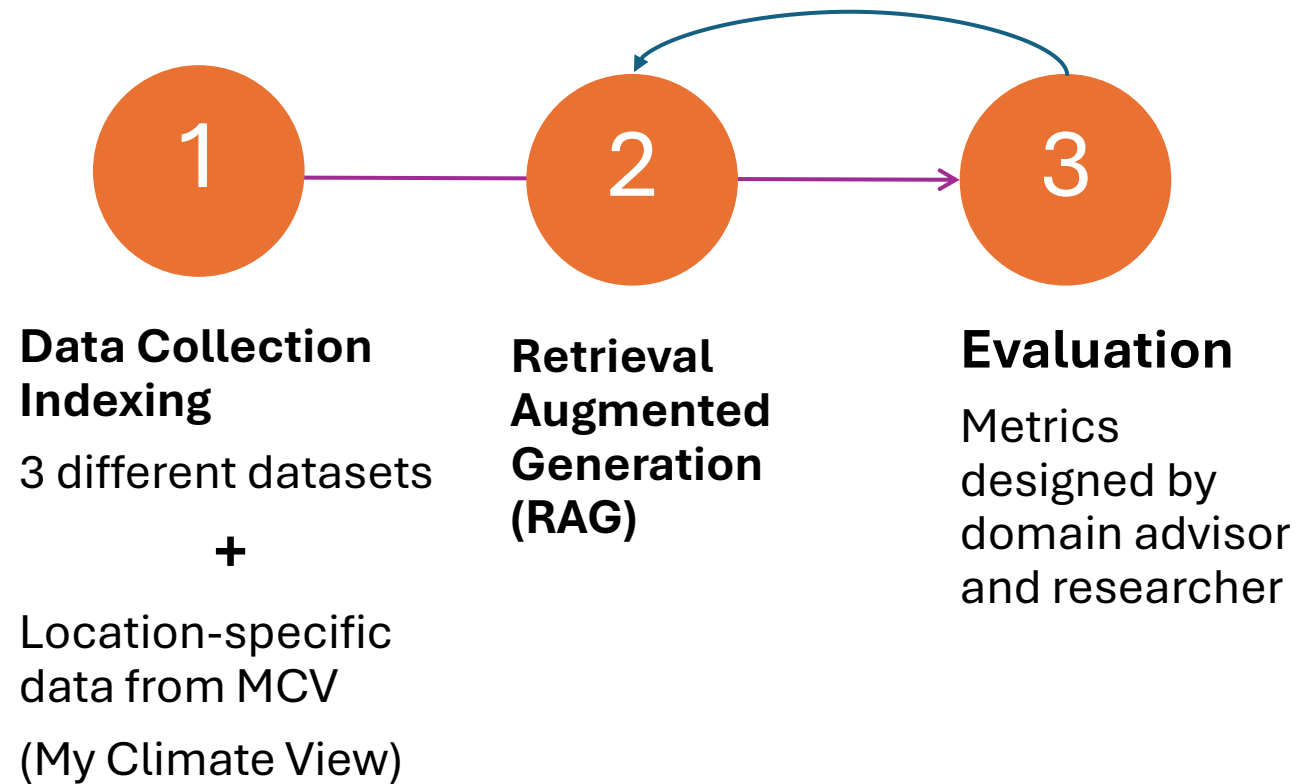
- The IPCC states that **climate will change** regardless of mitigation efforts¹
- Climate change will **inevitably affect agriculture**
 - Temperature and rainfall variability
 - Extreme climate events²

[1] Climate change means Australia may have to abandon much of its farming. <https://cbe.anu.edu.au/news/2021/climate-change-means-australia-may-have-abandon-much-its-farming>

[2] Peter Stott, How climate change affects extreme weather events. *Science* 352,1517-1518(2016).DOI:[10.1126/science.aaf7271](https://doi.org/10.1126/science.aaf7271)

How do we ~~mitigate~~ **adapt** climate impacts for *Australian* agriculture?

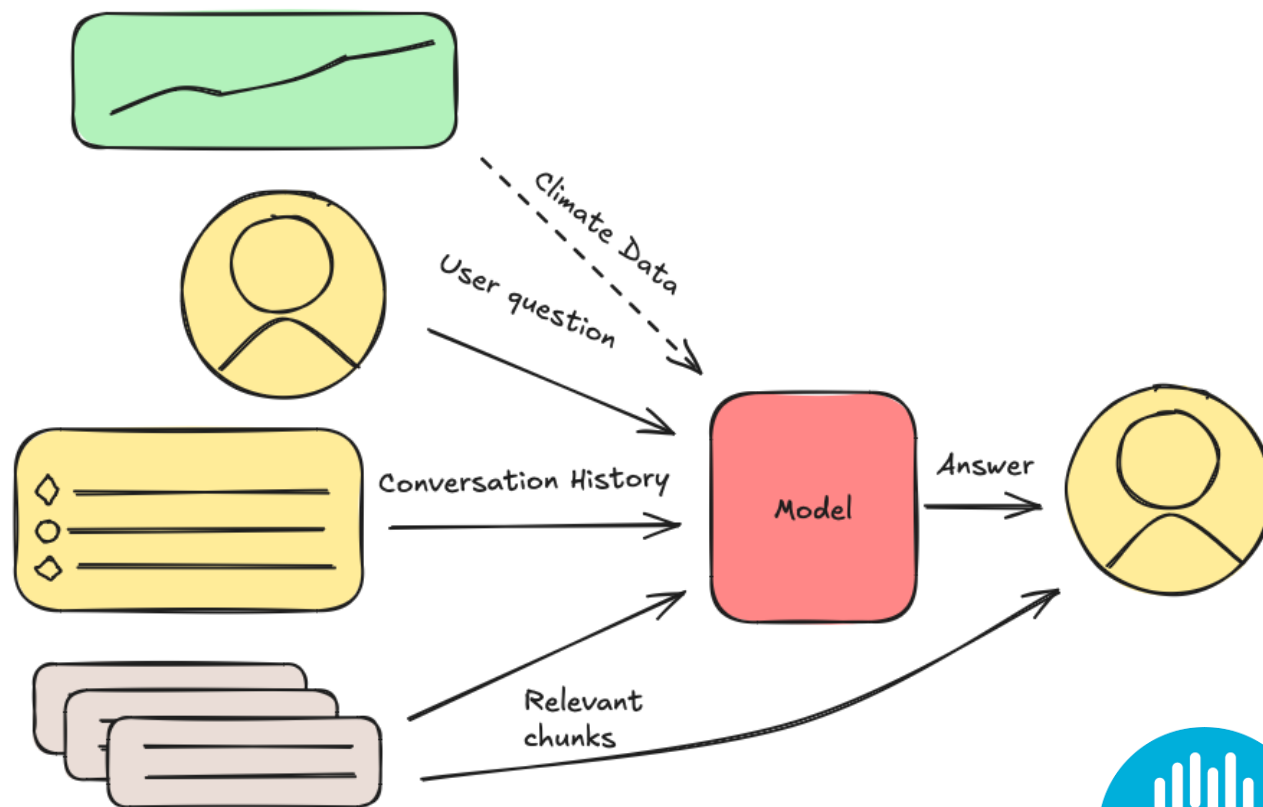
My Climate Copilot Prototype



[1] Vincent Nguyen, Sarvnaz Karimi, Willow Hallgren, Ashley Harkin, and Mahesh Prakash. 2024. [My Climate Advisor: An Application of NLP in Climate Adaptation for Agriculture](#). In *Proceedings of the 1st Workshop on Natural Language Processing Meets Climate Change (ClimateNLP 2024)*, pages 27–45, Bangkok, Thailand. Association for Computational Linguistics.

Scientifically robust RAG

- Open-source model: Llama-3 8b
 - user privacy
 - reduce greenhouse emissions
- Generate responses given to a user's question with:
 - Climate data
 - Conversation history
 - Relevant literature (~2m documents)



Evaluation: How do we measure quality?

- **15 sample questions** provided by domain experts

Will my rainfall continue to increase in variability in Northern NSW?

How will climate change impact cherry production in Young?

- Domain experts designed **7 metrics**
 - **Style and Substance**
- Compared against proprietary models

Pitfalls, preference and hallucination

- Competitive against proprietary offerings (GPT-4, Claude)
 - Falls behind flagships, but beats public offering ChatGPT, Gemini

- Stylistic preferences
 - Answers are **accurate**, but *not well-presented*

- Location names are ambiguous

Will my rainfall continue to increase in variability in Northern NSW?
How will climate change impact cherry production in Young?

- Hallucinations

What varieties of apples are more tolerant to sunburn?

Gemini 1.0 pro: “Apples do not get sunburned”

GPT-4o: The response was filtered due to the prompt triggering Azure OpenAI’s content management policy. Please modify your prompt and retry.





My Climate Copilot

- Accessible Australian climate adaptation information
- An evaluation framework for climate adaptation question-answering

myclimateview.au

Australia's National Science Agency

- **Contact:**

- Vincent Nguyen (Vincent.Nguyen@csiro.au)
- Sarvnaz Karimi (Sarvnaz.Karimi@csiro.au)