

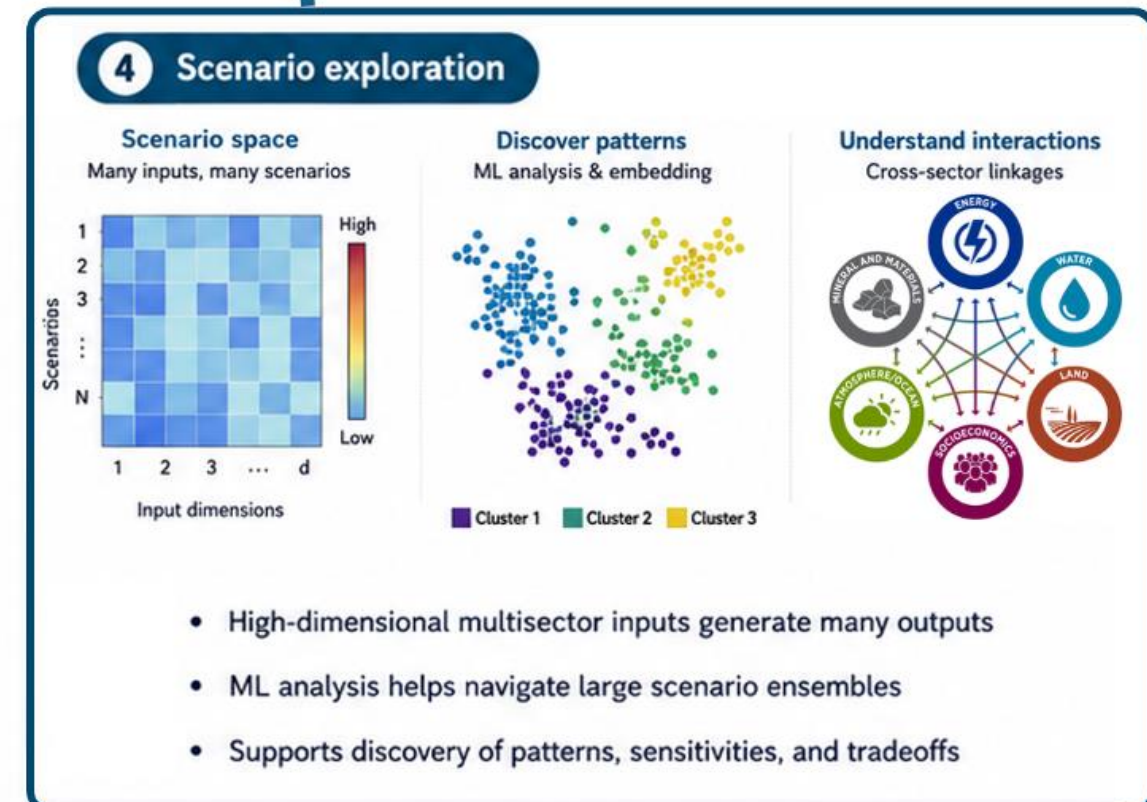
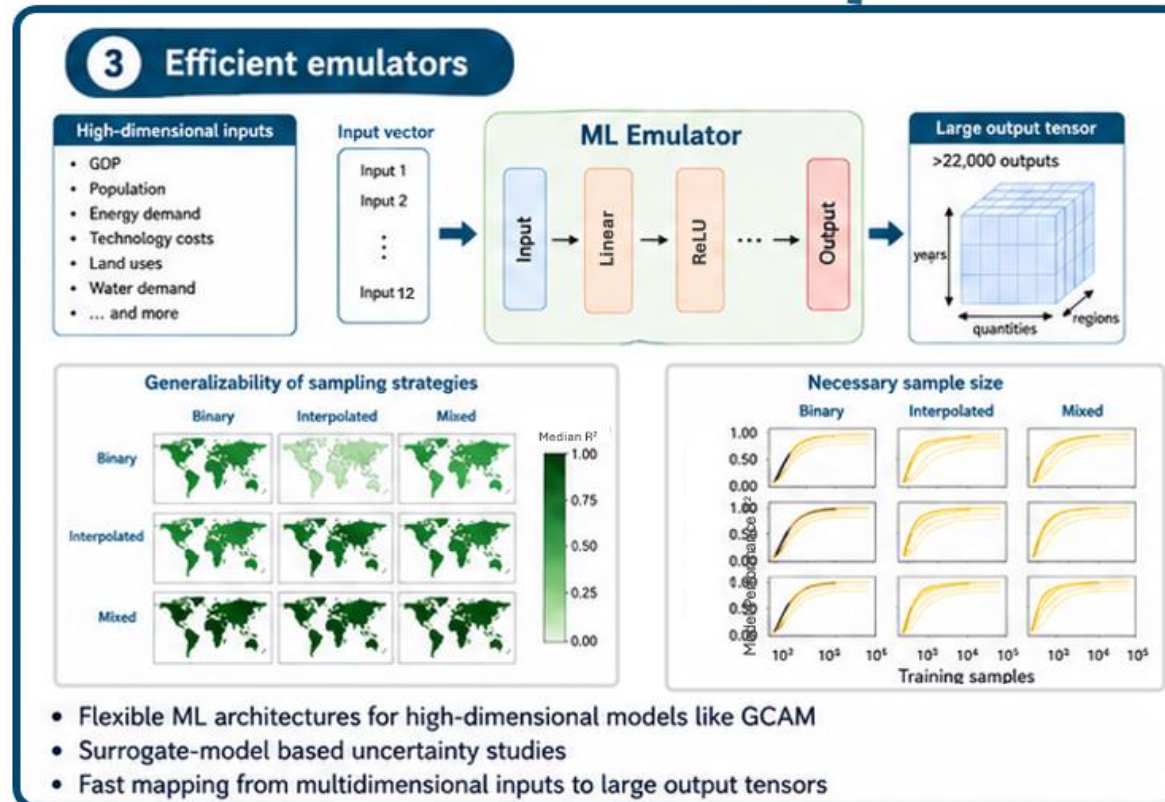
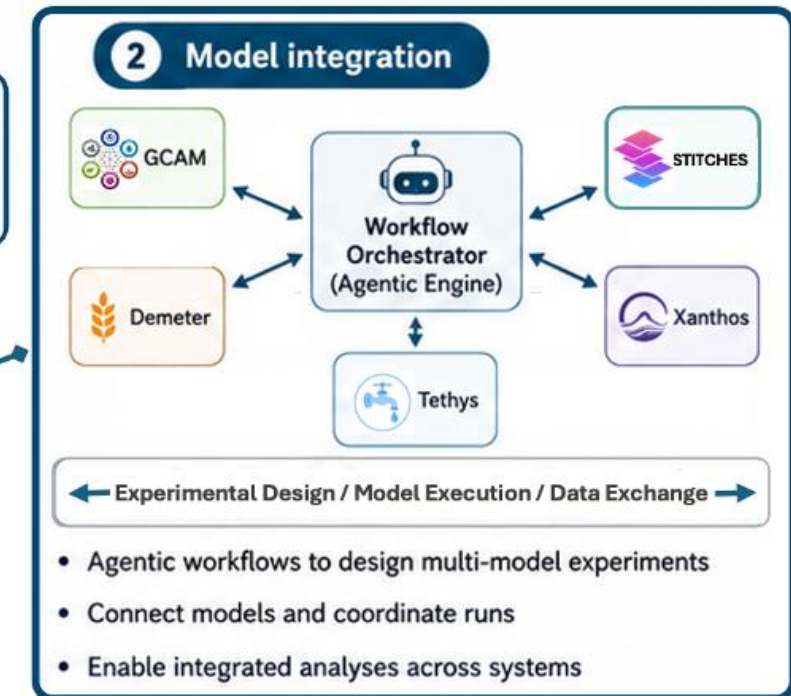
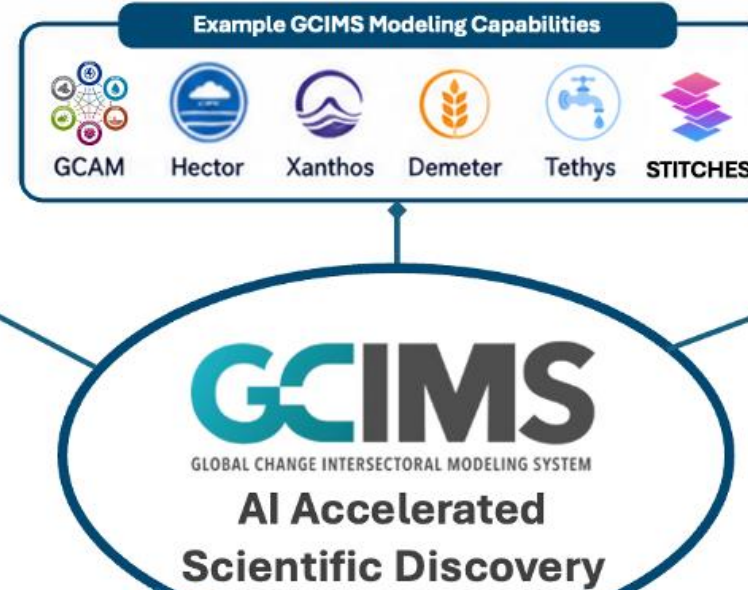
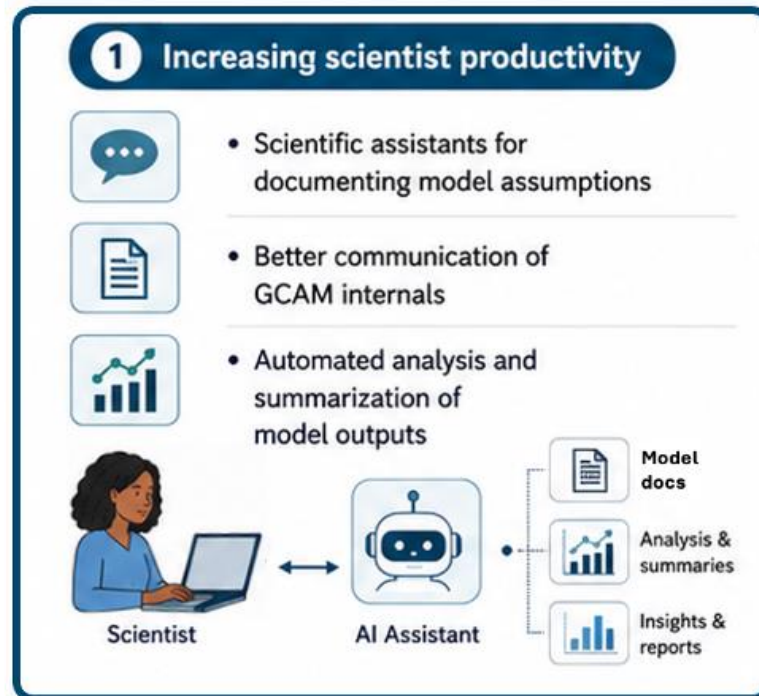
AI in GCIMS: Past, Present, and Future

GCIMS Project Team

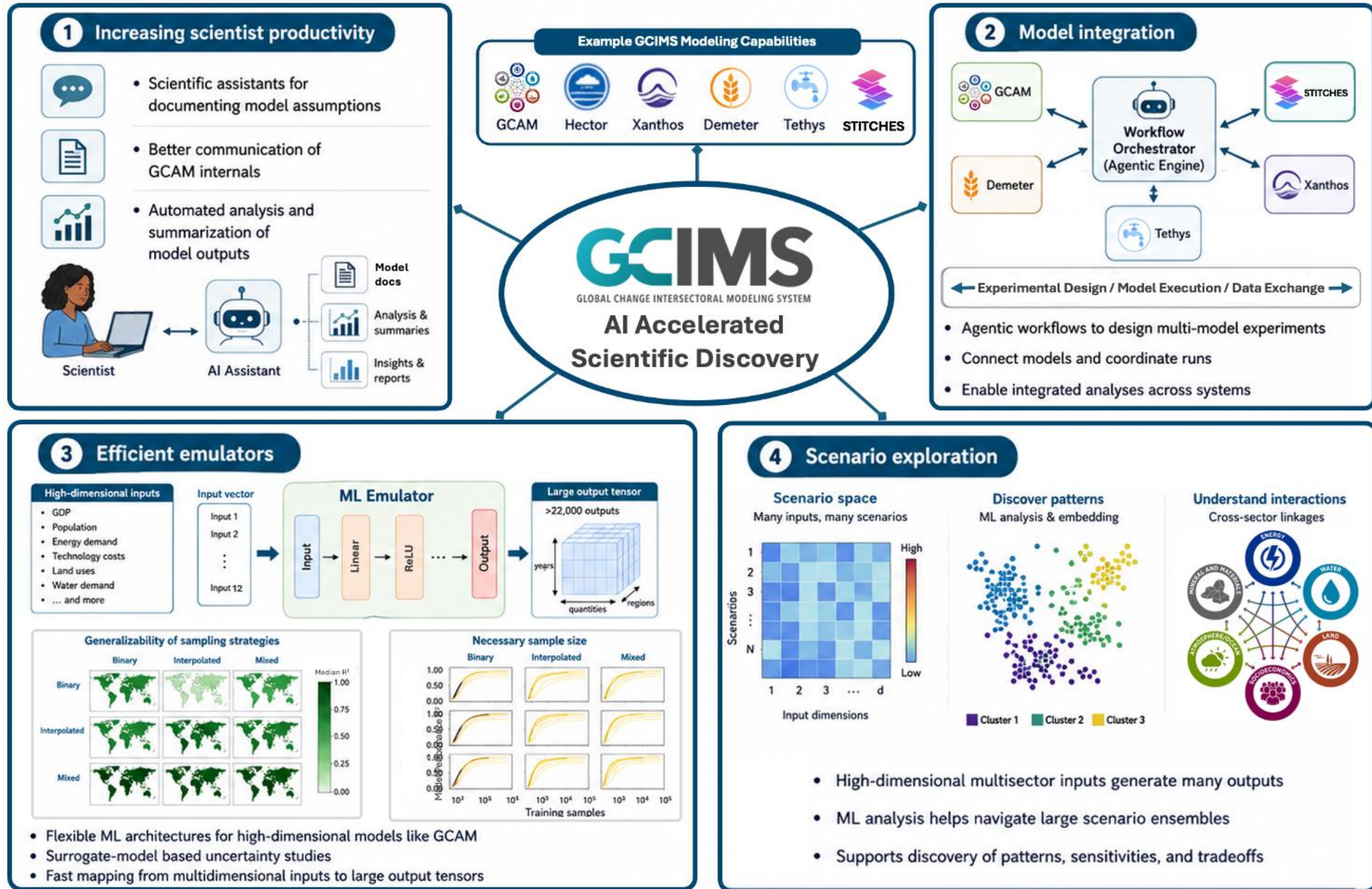
Chris Vernon

June 2, 2026

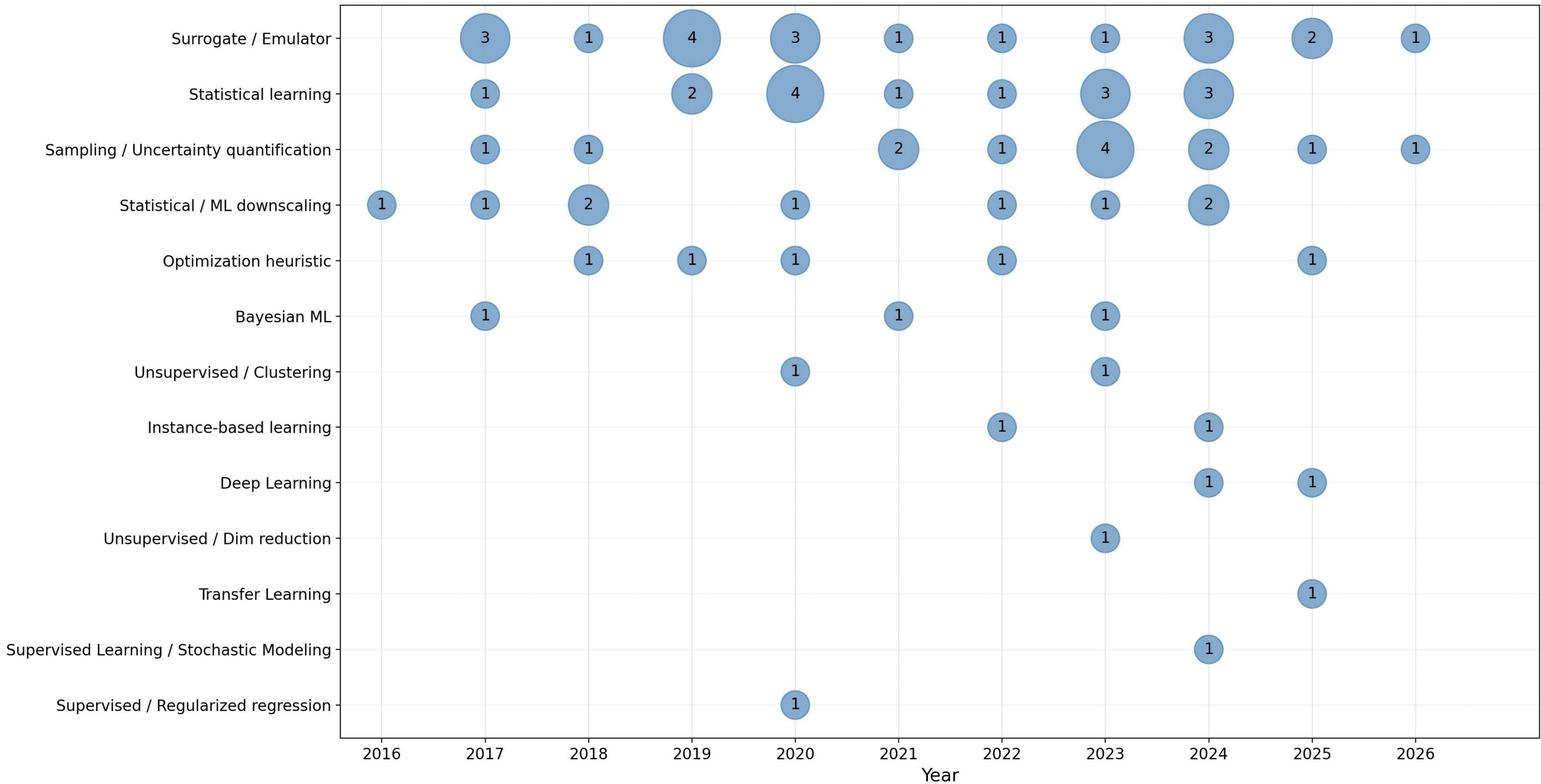




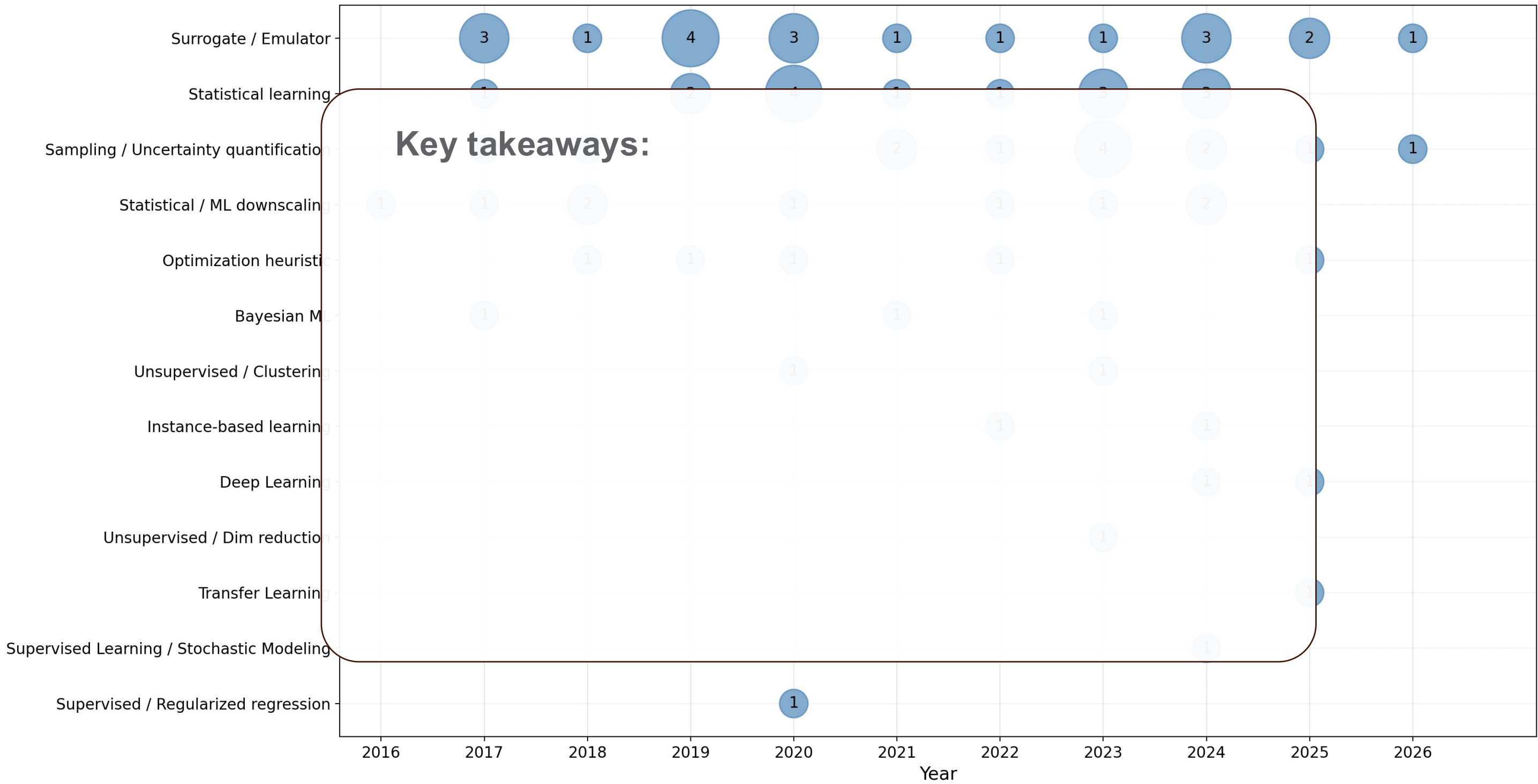
Progressing from “What can AI tell me?” to “What can AI do for me?”



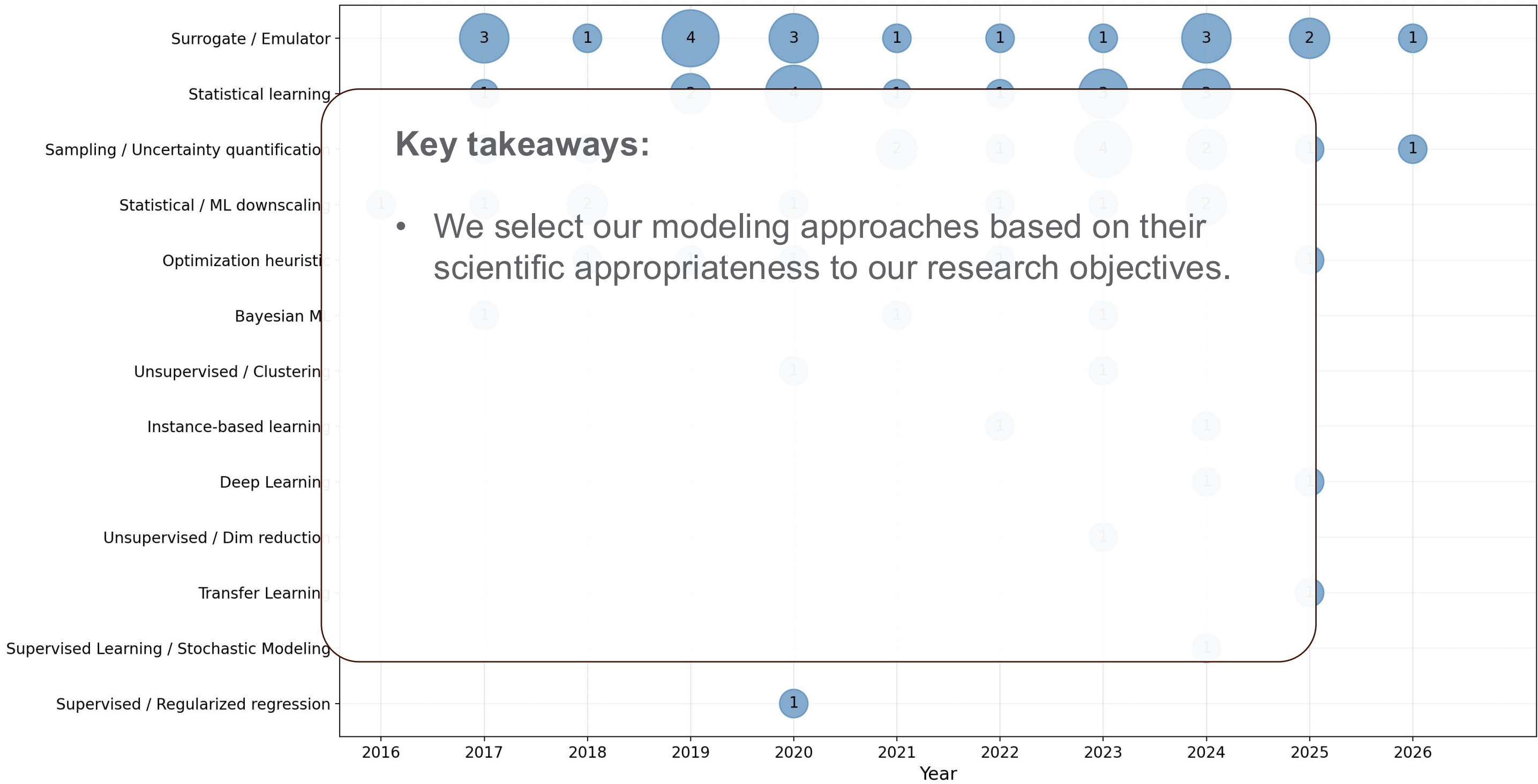
A selection of statistical and AI/ML methods from over GCIMS publications



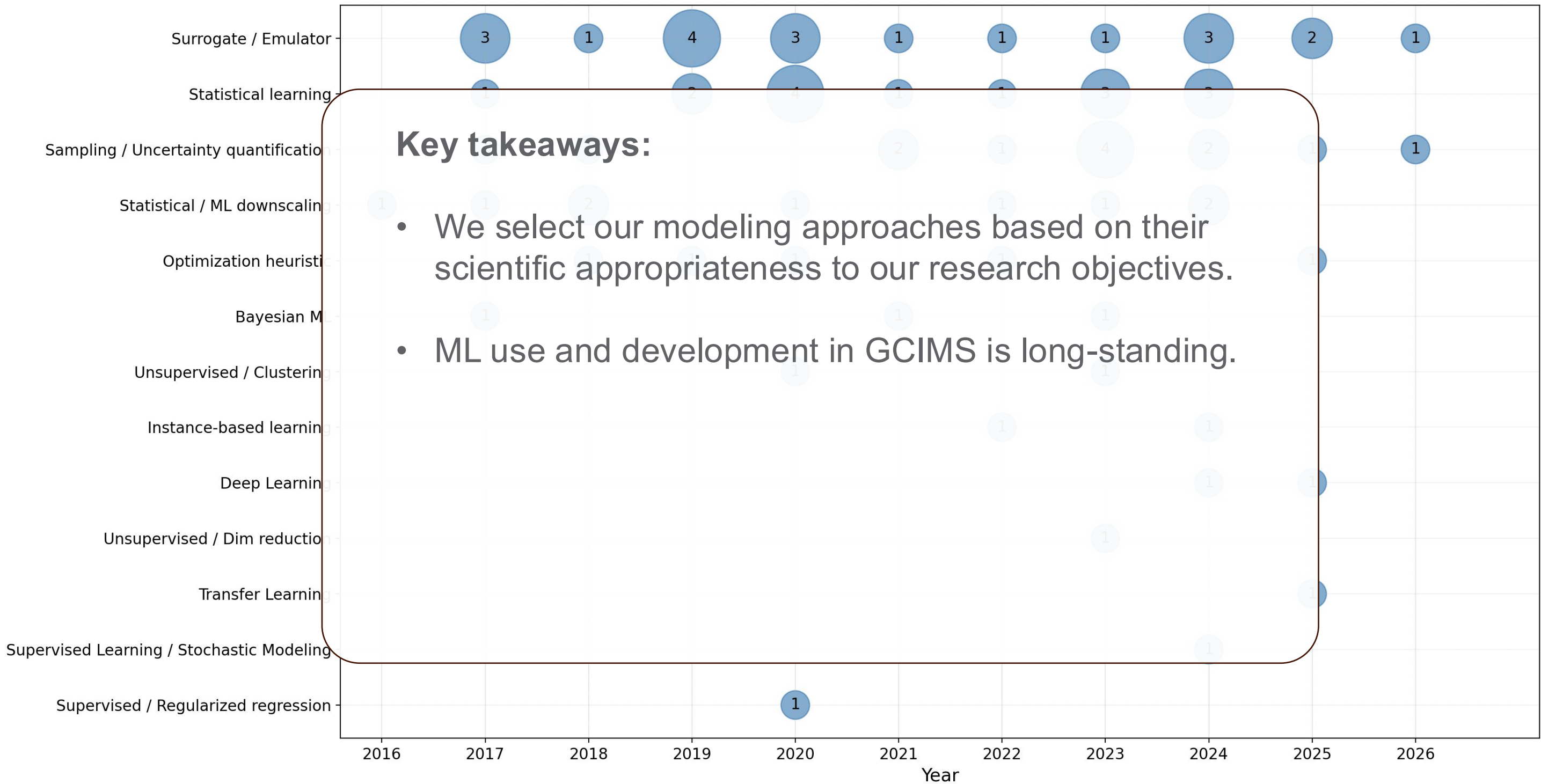
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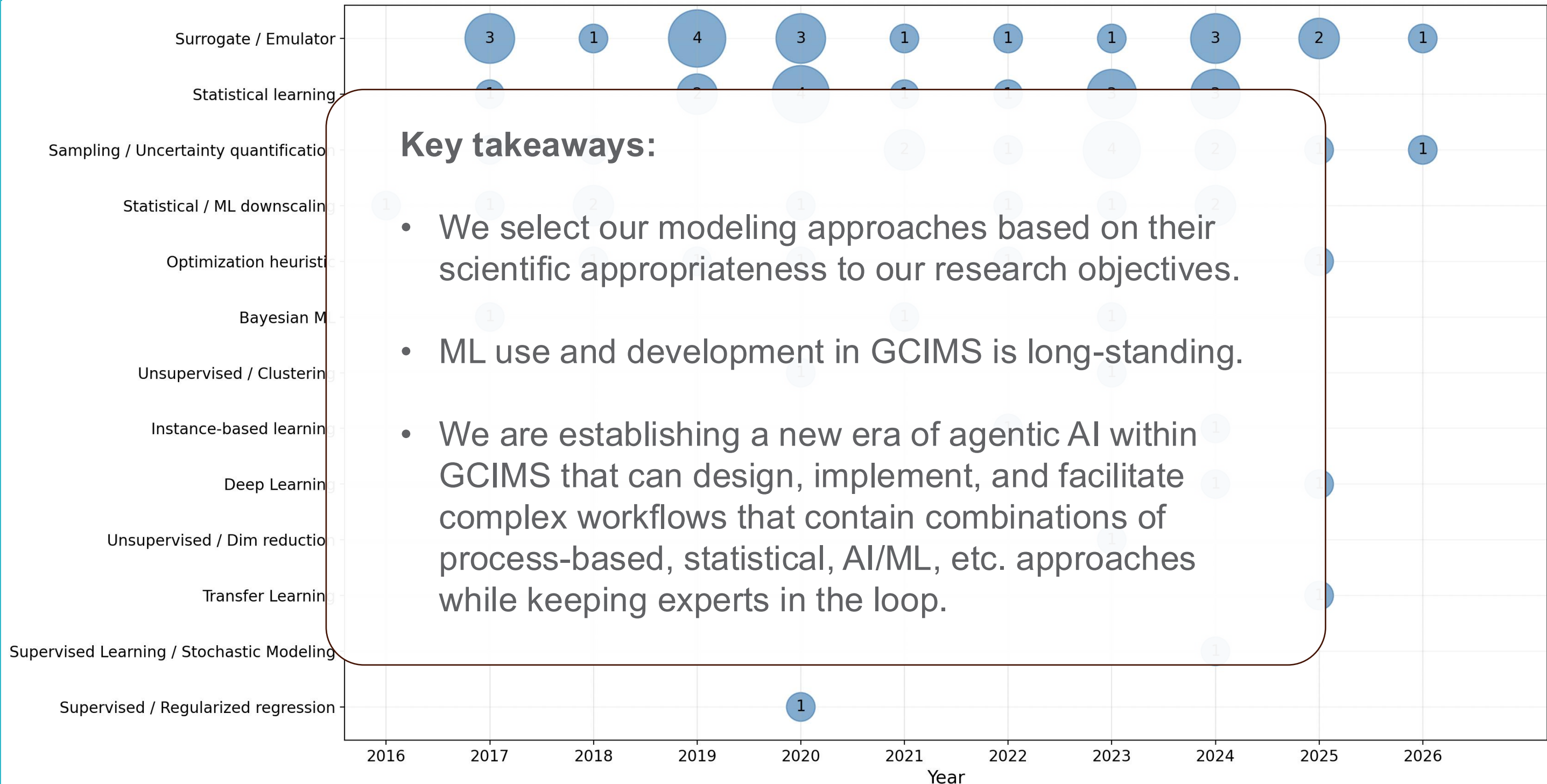
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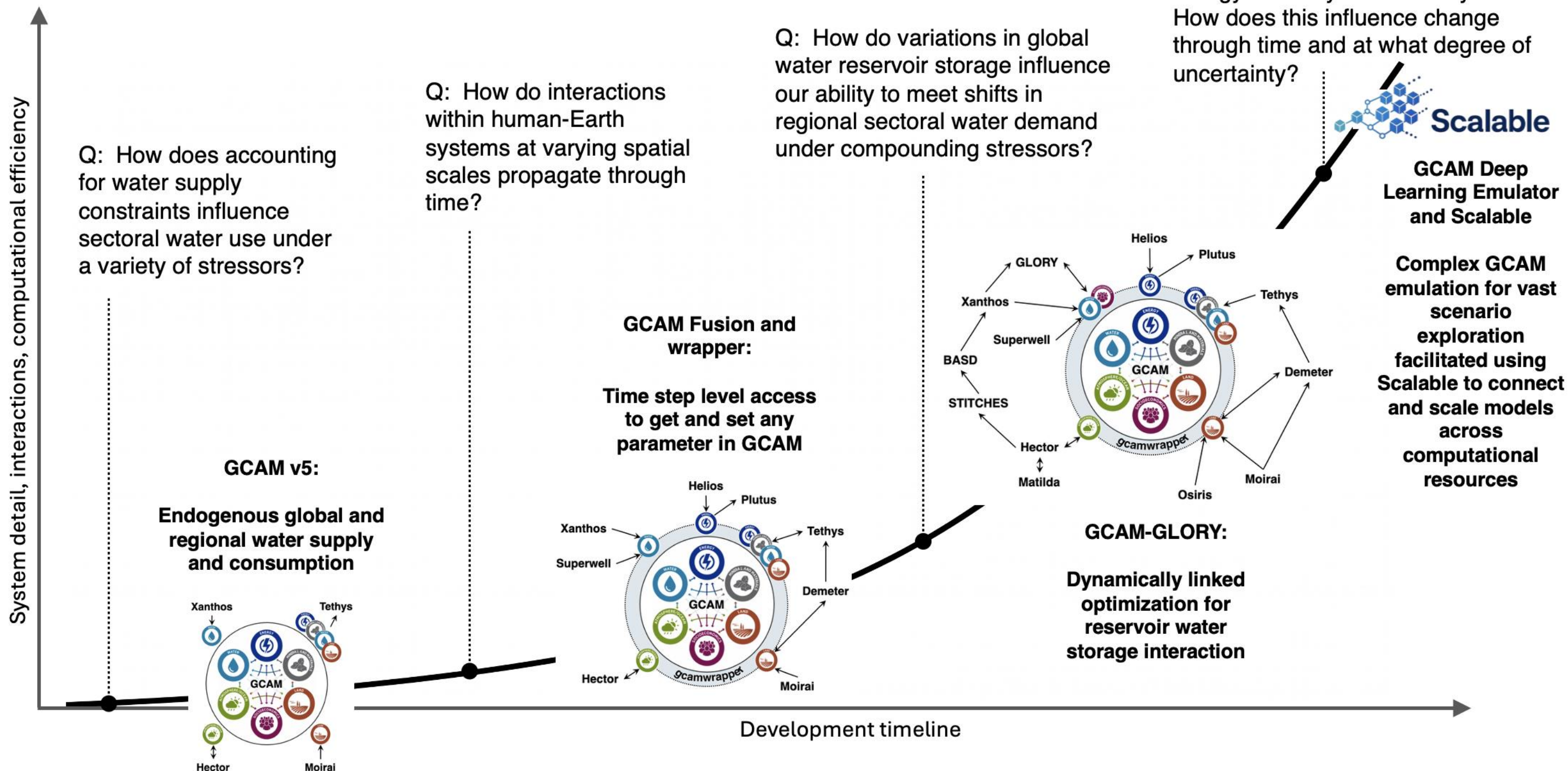


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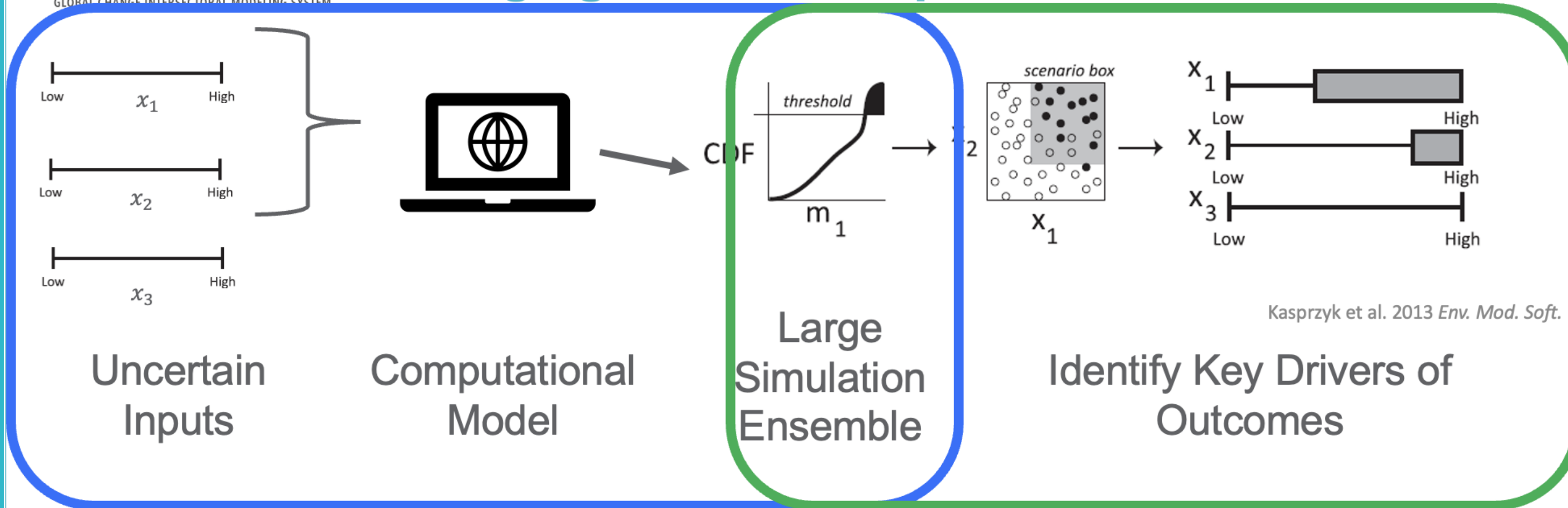


A selection of statistical and AI/ML methods from over GCIMS publications





Things get more complex with GCAM



Claudia

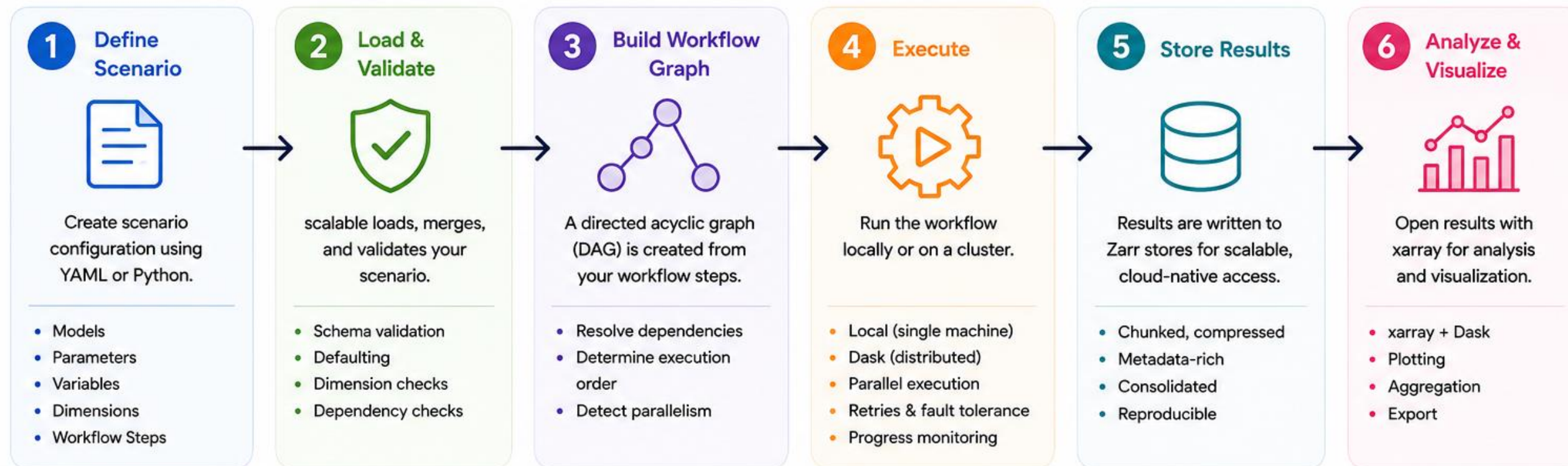
Brian

1. How do you meaningfully and efficiently create ensembles sampling thousands of parameters and inputs to multiple sectors?
2. How do you analyze and extract insight from an ensemble once you have it?
3. How do you make all of this more efficient and easier to communicate? -> **Chris**



Scalable

From scenario definition to distributed execution and results



Built for Scale



Source Code: <https://github.com/JGCRI/scalable>



Documentation: <https://scalable.readthedocs.io>



Community: [Discussions on GitHub](#)

Scalable Live Demo of AI/ML functionality

Datasets

Each dataset corresponds to a single study and contains its scenarios and queries. Exactly 1 dataset may be chosen per session.

 Search by dataset name

 **FILTER**

☐ GCAM v7.0

☐ GCAM v7.1

☐ GCAM v8.2

☐ GCAM v8.5

☒ GCAM v8.8

GCIMS Explorer Team Leads



Mengqi Zhao
Overall
Capability Lead



Abigail Snyder
Scaling and
Discovery Lead



Tycko Franklin
Cloud,
Software, and
Deployment Lead



GCIMS AI Assistant

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Note: This assistant is a beta feature and may occasionally provide inaccurate information. Please verify responses as needed.

Show me datasets related to a topic ➤

Show me recently uploaded datasets ➤

What are the best Datasets related to water studies? ➤

Search with AI ➔

✓ test_0 

1. Dataset

— 2. Queries

— 3. Scenarios

— 4. Visualization

QUERIES ➔

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QUERIES 

Sectors

Energy ✕

Water ✕

Queries

Queries are predefined variables extracted from GCAM output databases. Select up to 8 you'd like to explore from the right or by using the dropdown below:

Select Queries ▾

elec gen by gen tech ✕

elec prices by sector ✕

water consumption by sector ✕

← **BACK**

NEXT →

Energy

+ building final energy by fuel

+ building final energy by tech

✓ elec gen by gen tech

✓ elec prices by sector

+ final energy consumption by fuel

+ final energy consumption by sector and fuel

+ final energy prices

+ industry final energy by fuel

+ primary energy consumption by region (avg fossil efficiency)

+ regional biomass consumption

+ regional iron and steel sources

+ regional primary energy prices

+ total final energy by aggregate sector

+ total final energy by sector

+ transport final energy by fuel

+ transport final energy by tech (new)

Water

+ Basin level available runoff

+ irrigation water consumption by crop type and land region

+ irrigation water consumption by crop type

+ irrigation water withdrawals by crop type and land region

+ irrigation water withdrawals by crop type

+ water consumption by region

✓ water consumption by sector

+ water consumption by state, sector, basin

+ water consumption by water mapping source

+ Water Withdrawals by Basin (Groundwater)

+ Water Withdrawals by Basin (Runoff)

+ water withdrawals by region

+ water withdrawals by sector

+ water withdrawals by state, sector, basin

+ water withdrawals by water mapping source

+ Water withdrawals by water source (runoff vs.

Showing **9 / 9** possible scenarios.

Click a scenario line to learn more and pin.

 [CHART SETTINGS](#)

Year 2030 ▾

**building final
energy by fuel**

Region: Global

140 EJ



132 EJ

**building final
energy by tech**

Region: Global

140 EJ



132 EJ

**elec gen by
gen tech**

Region: Global

137 EJ

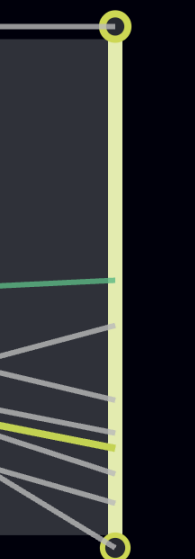


130 EJ

**elec prices by
sector**

Region: Global

1.31K 1975\$/GJ



1.04K 1975\$/GJ

Max

140

140

137

1314

Min

132

132

130

1044

2/8 Pins  GCAM_SSP1_2p6   GCAM_Reference 

✓ asdf 

1. Dataset — 2. Queries — 3. Scenarios — 4. Visualization

← [QUERIES](#)

[VISUALIZATION](#) →

Pinned Scenarios

2/8 Pins Used

GCAM_SSP1_2p6



GCAM_Reference



Queries

4/8 Slots Used

= building final energy by fuel



= building final energy by tech



= elec gen by gen tech



= elec prices by sector



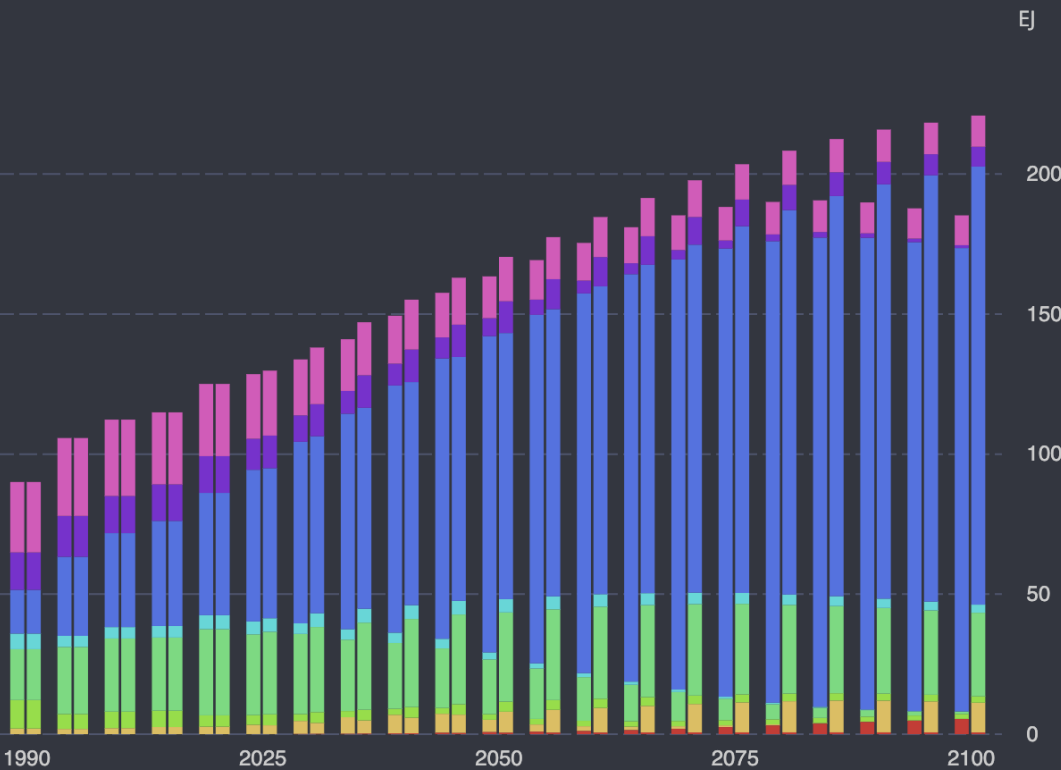
Charting each
query

 **VISUALIZATION SETTINGS**

 **List**

 **Grid**

building final energy by fuel



 H2 retail delivery  delivered biomass  delivered coal

Search with AI



✓ asdf 

1. Dataset

2. Queries

3. Scenarios

4. Visualization

 **Charts: Page 1** ▾

← **PREVIOUS STEP**

Thank you!