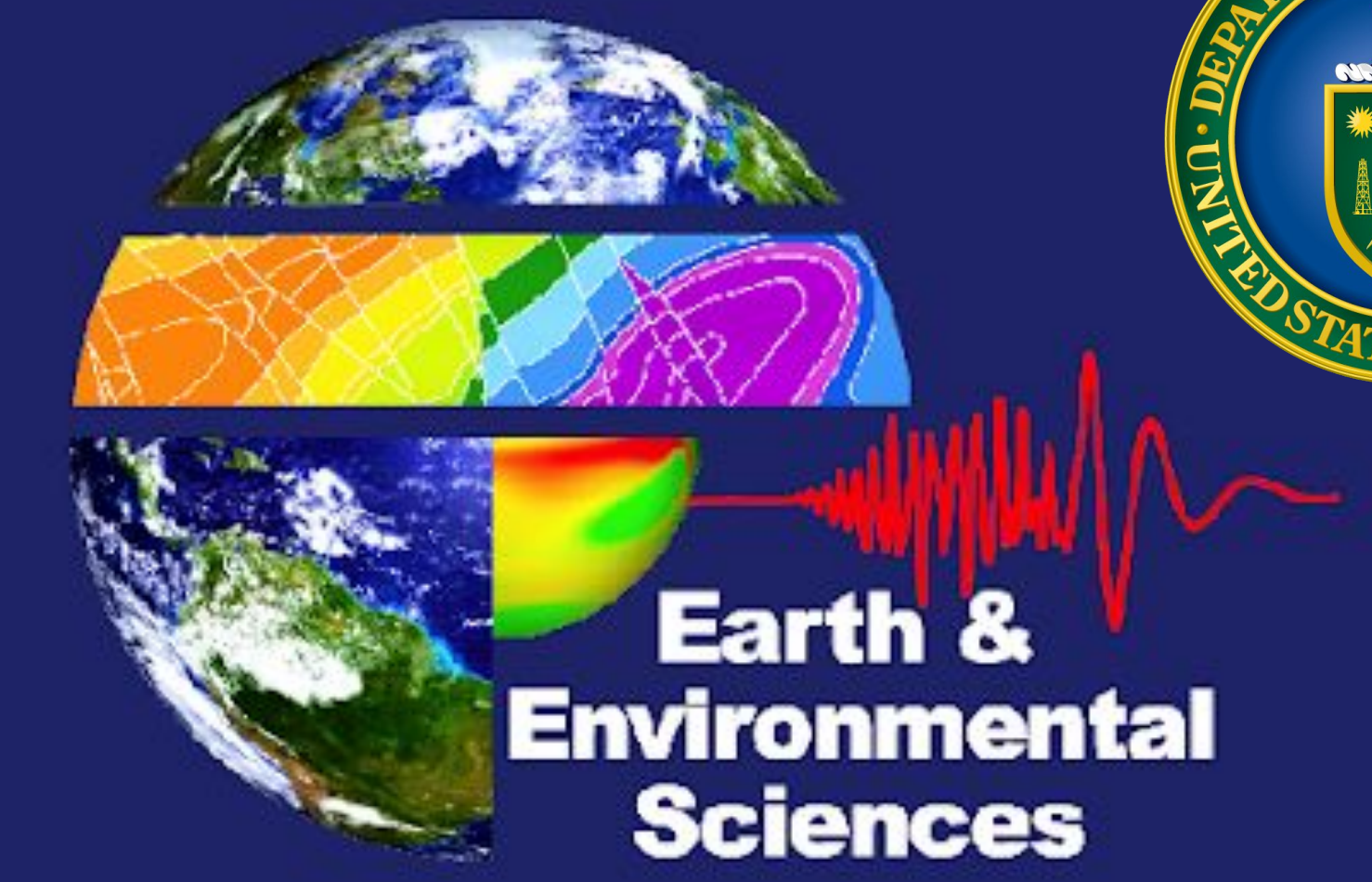


# Pipeline Infrastructure Modeling in the SECARB-USA Region

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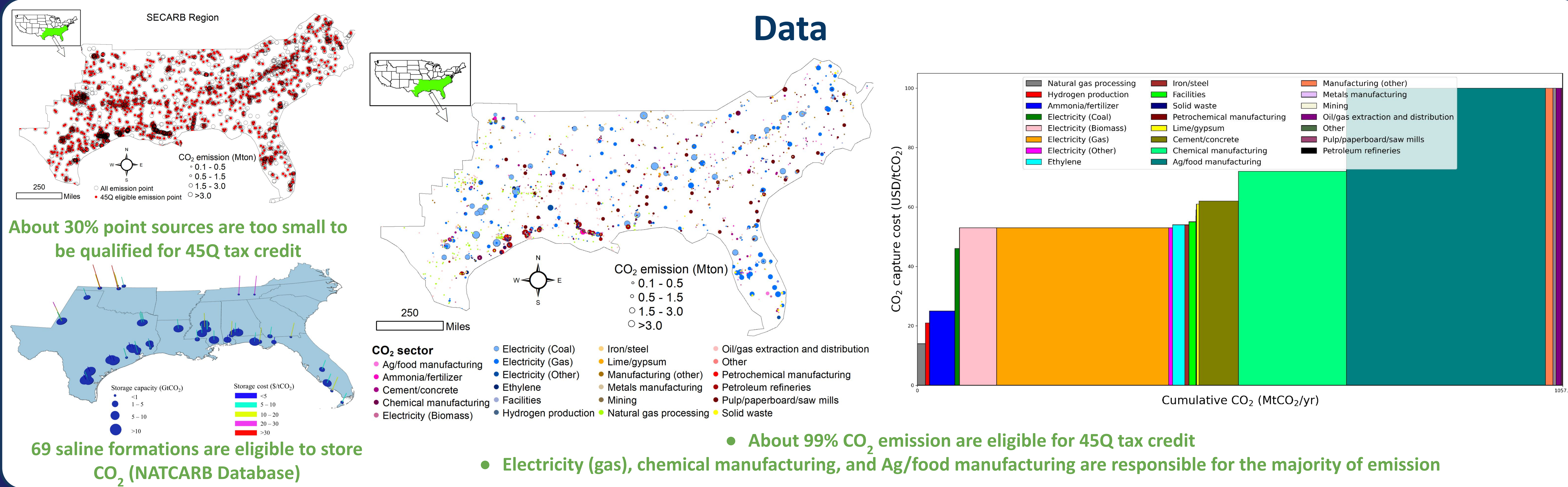
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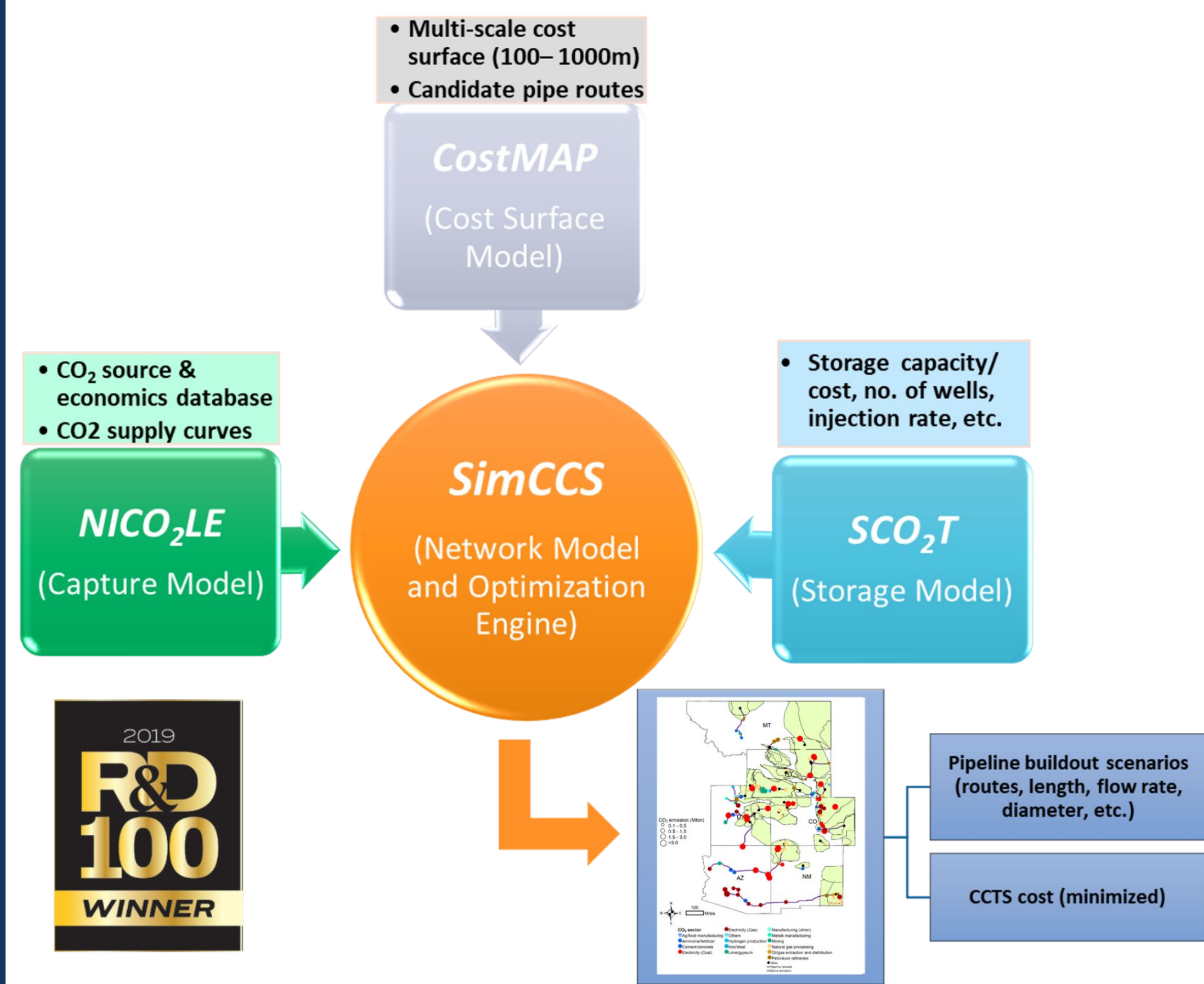


## Introduction

- Determined point sources, emission amount, and corresponding capture costs.
- Evaluated the storage capacity and injection & storage costs of the eligible 69 saline storage sites in the SECARB region using  $SCO_2T$  tool.
- Built pipeline scenarios in five phases (5 year/phase) for considering w / wo environmental justice (EJ) scenarios.
- Pipeline length gradually increases with phases.
- The pipeline length of the EJ-restricted scenario is shorter than the one without EJ restriction.
- The pipeline length is higher in EJ-restricted scenario by 5%.

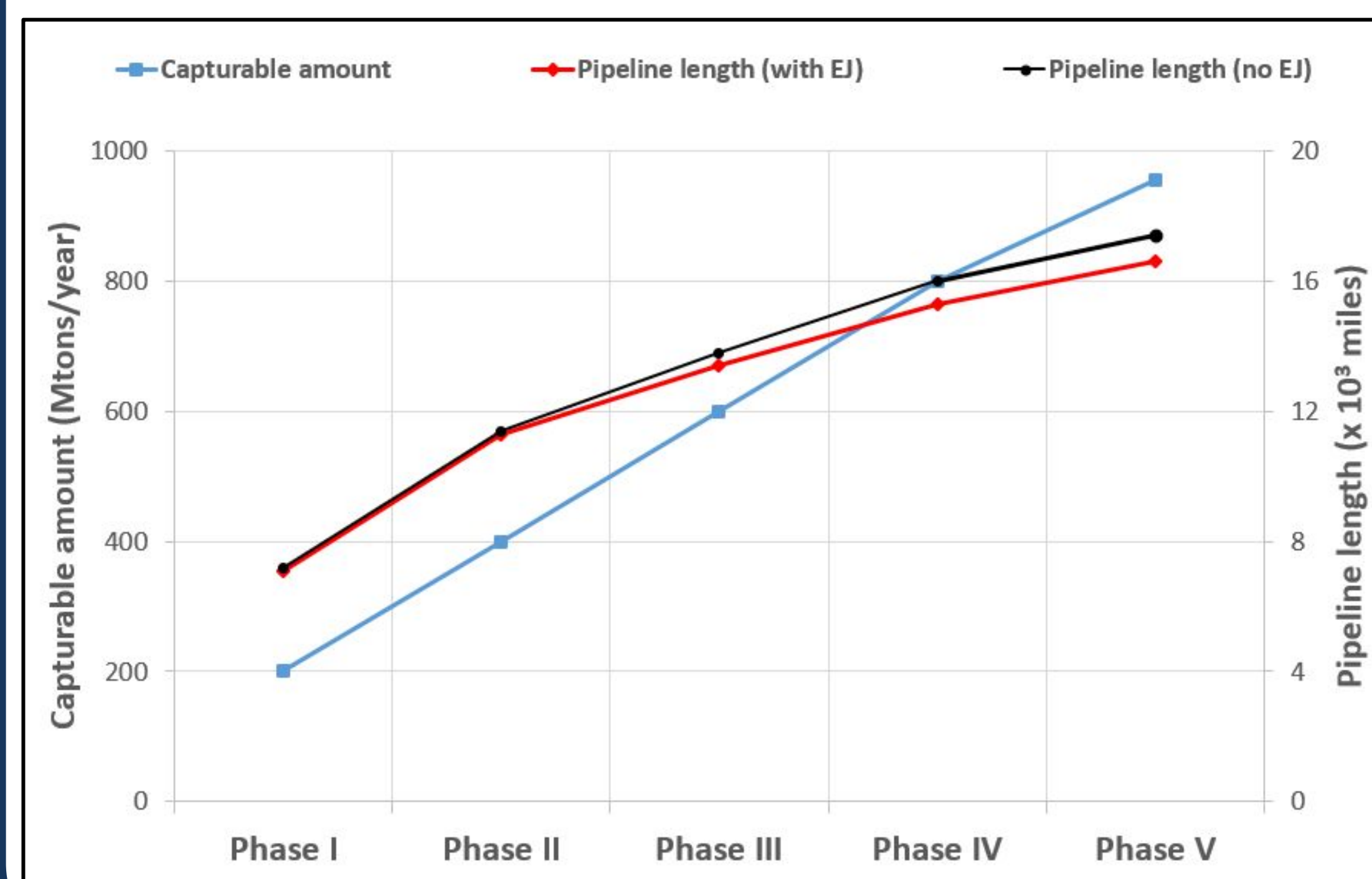
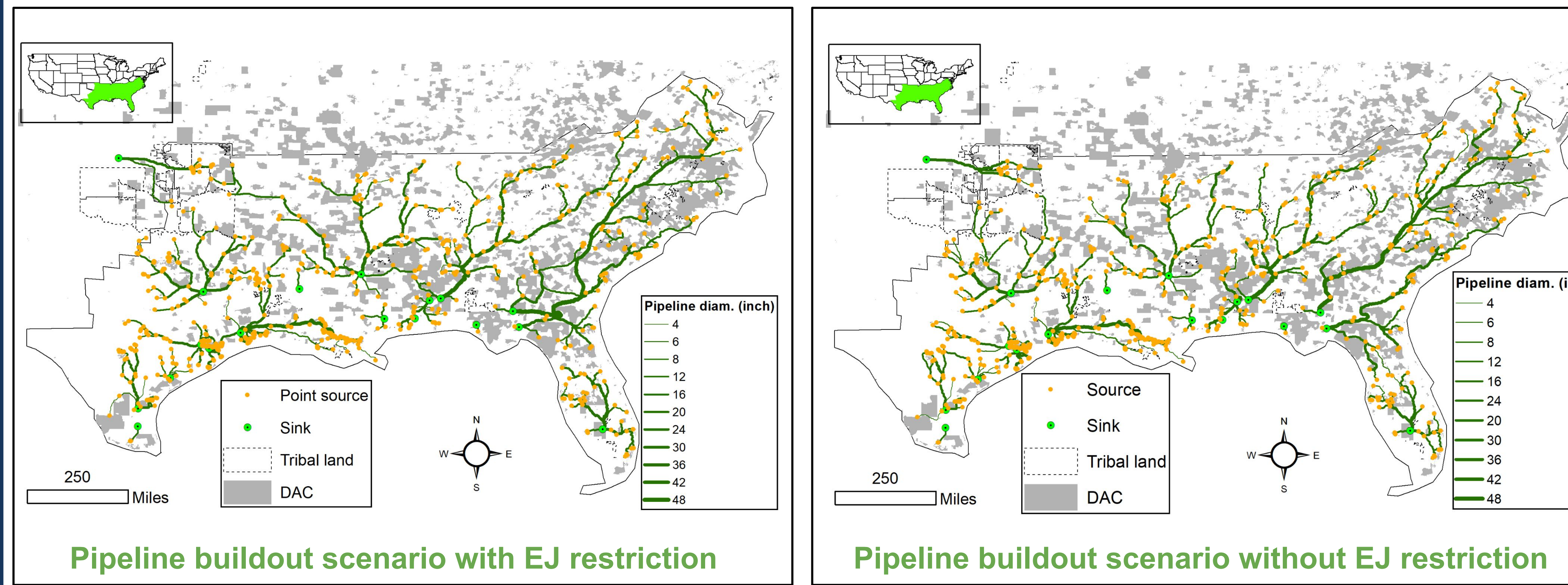


## Methods



- **CostMAP**: Provides a quantitative means of assigning social, environmental, and engineering costs that impact pipeline buildout across landscapes.
- **NICO<sub>2</sub>LE**: Finds eligible point sources and corresponding capture costs.
- **SCO<sub>2</sub>T**: Obtains eligible storage sites and their storage costs.
- **SimCCS**: Utilizes outputs from **CostMAP**, **NICO<sub>2</sub>LE**, and **SCO<sub>2</sub>T** and optimizes pipeline buildout scenario by minimizing buildout costs.

## Results



	EJ restriction	No EJ restriction
<b>Capturable amount (Mtons/year)</b>	956	956
<b>Pipeline length (miles)</b>	17.37 (4.7% longer)	16.59
<b>Pipeline diameter (in.)</b>	4"-48"	4"-48"

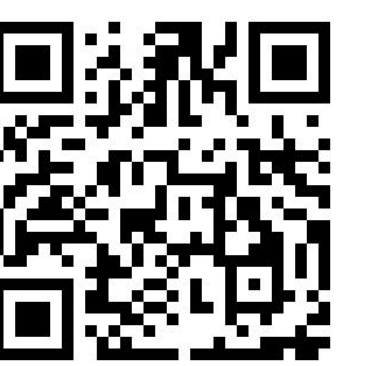
## Conclusions

- The volume of CO<sub>2</sub> assumed captured and stored in each phase includes 200, 400, 600, 800 and 956 million tons/year.
- The captured volume at each phase, except the last one, is 200 million tons/year.
- For the case with EJ restriction, the pipeline length in each phase includes 7100, 11300, 13400, 15300 and 16600 miles.
- For the case without EJ restriction, the pipeline length in each phase includes 7200, 11400, 13800, 16000 and 17400 miles.

## References and POCs

Ma, Zhiwei et al. "Phase-based design of CO<sub>2</sub> capture, transport, and storage infrastructure via SimCCS<sup>3.0</sup>." *Scientific Reports* (2023).

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SimCCS github page

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