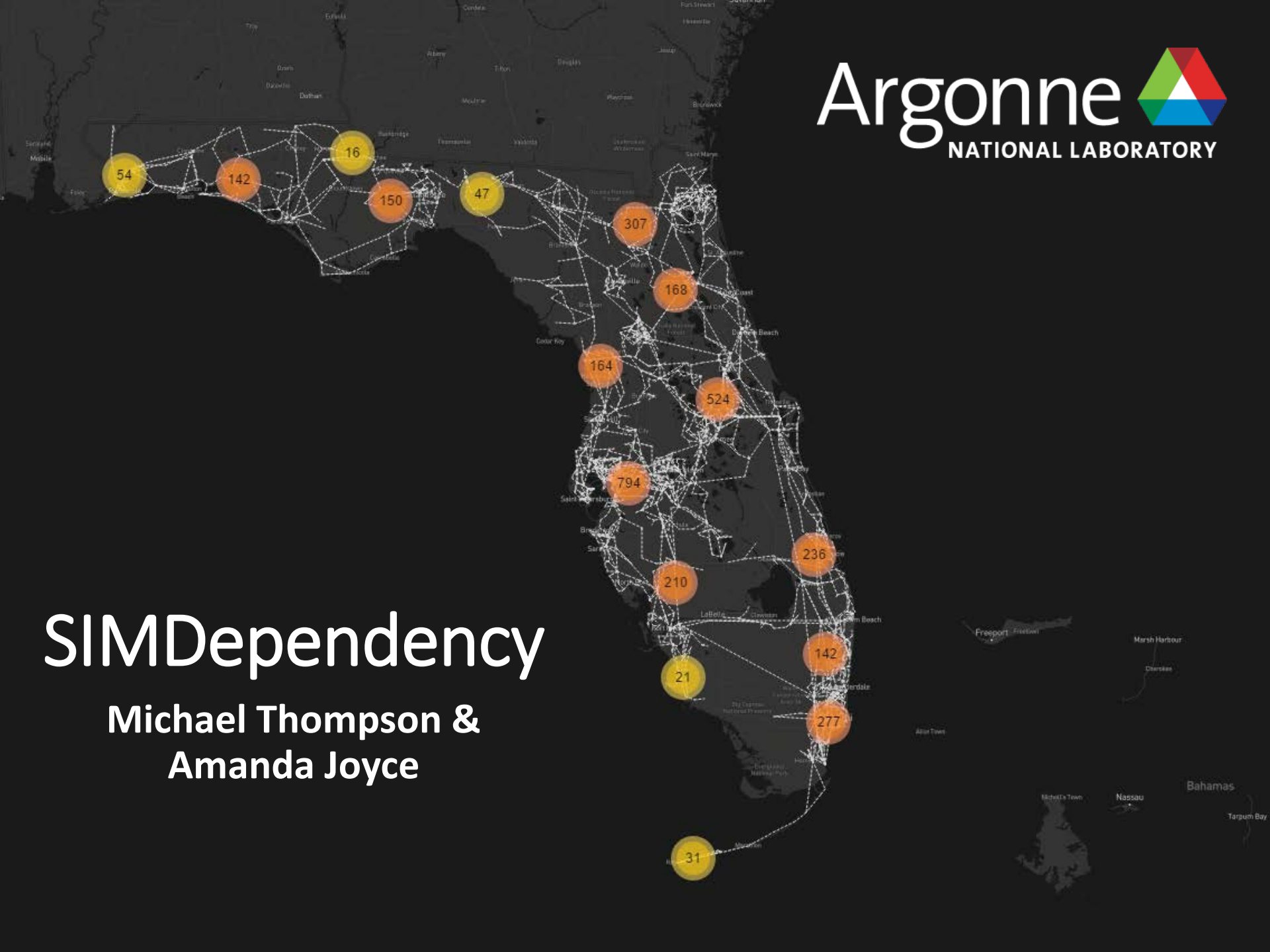


SIMDependency

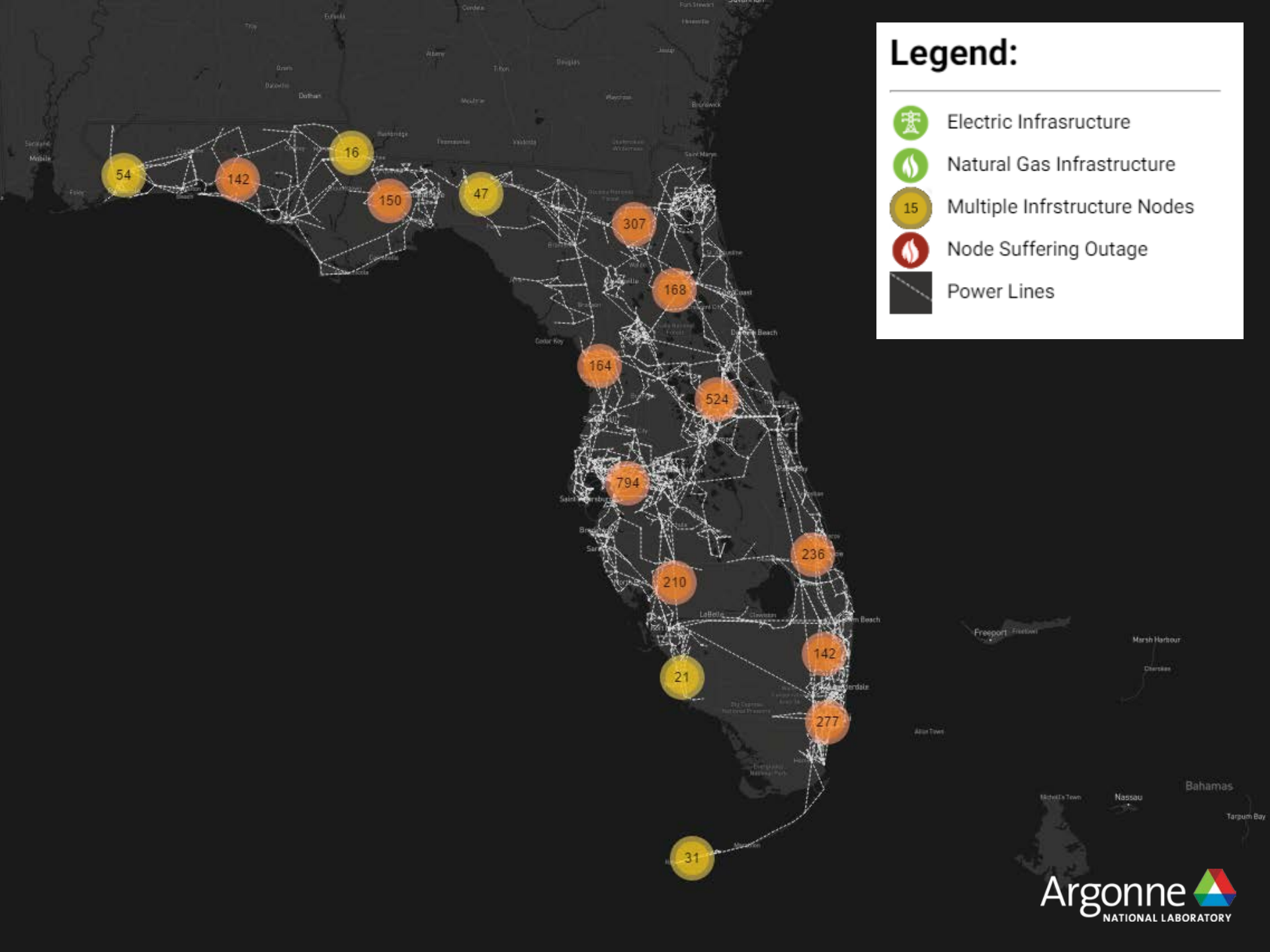
Michael Thompson &
Amanda Joyce

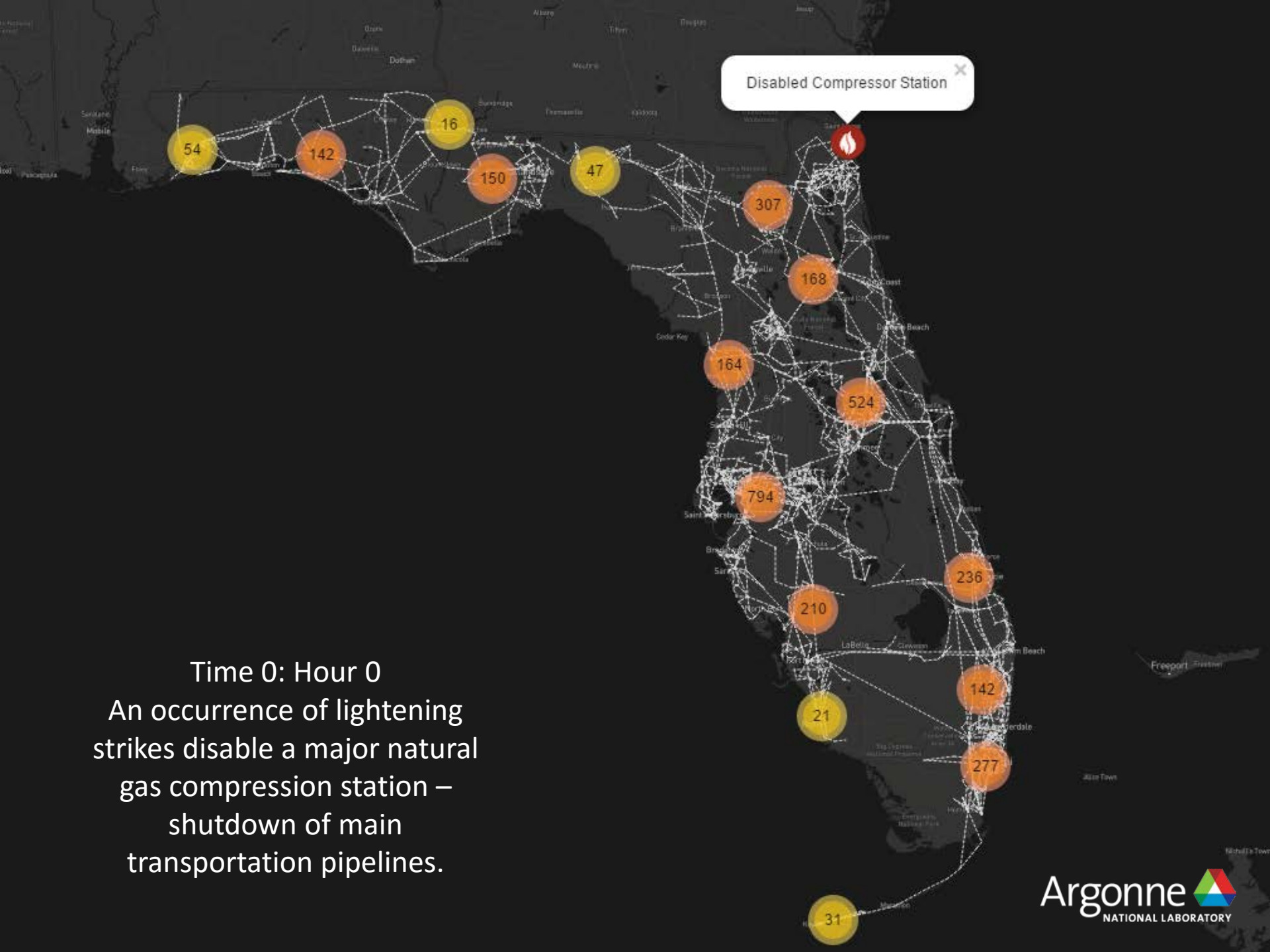
Background

- What happens when CIKR “A” goes down?
  - What caused CIKR “A” to go down?
  - Is CIKR “B” affected?
  - If yes, is that instant or a delayed affect?
  - If CIKR “B” goes out, what else is affected?

- We took these questions and began development on what we call SIMDependency.

- An interactive dependency mapping that allows an owner/operator the ability to see both upstream and downstream dependencies.


Legend:
Electric Infrasructure
Natural Gas Infrastructure
Multiple Infrstructure Nodes
Node Suffering Outage
Power Lines
54
142
16
150
47
307
168
164
524
794
236
210
142
21
277
31
15
Freeport
Marsh Harbour
Nassau
Bahamas
Argonne
NATIONAL LABORATORY



Time 0: Hour 0
An occurrence of lightening strikes disable a major natural gas compression station – shutdown of main transportation pipelines.

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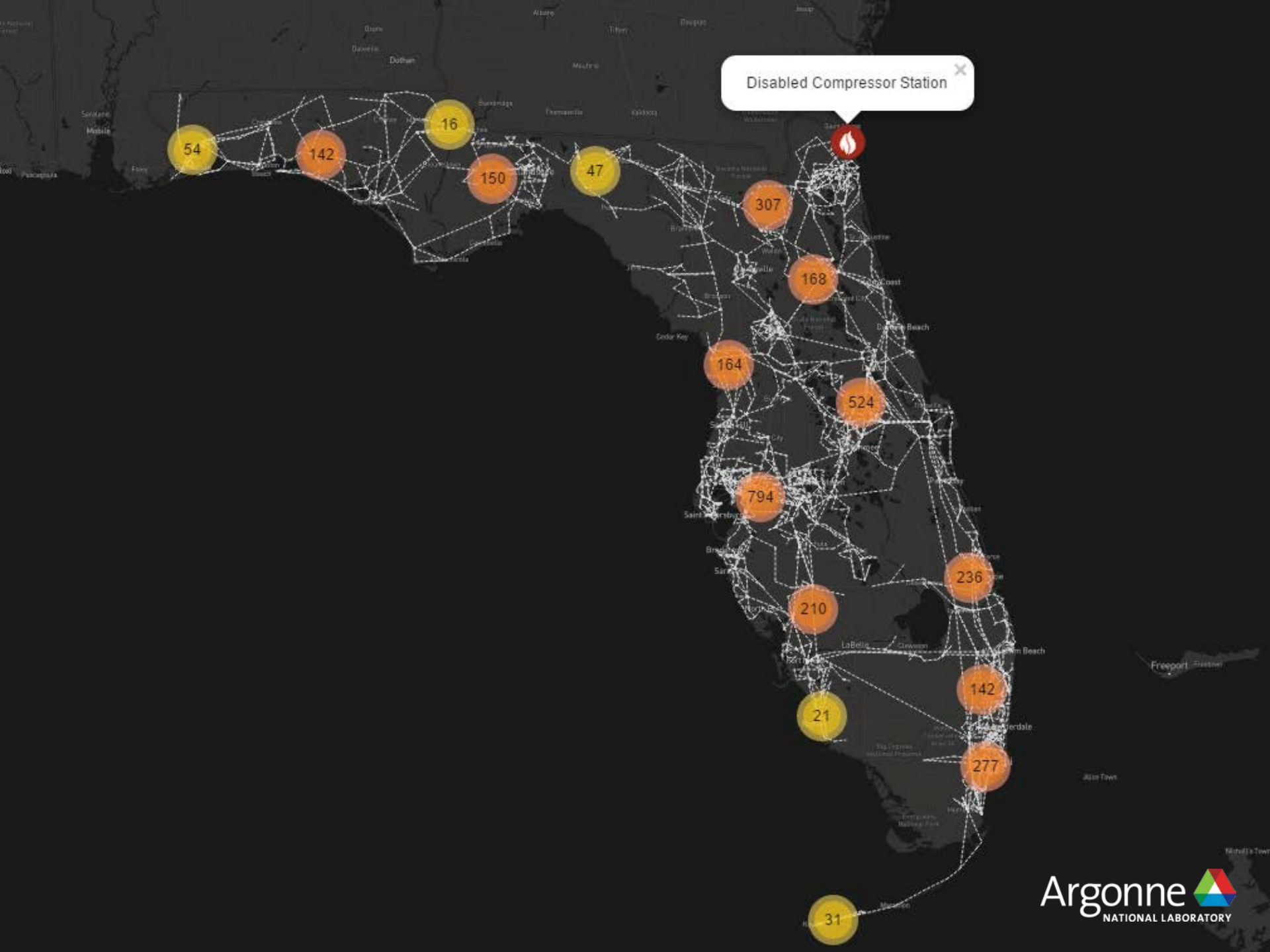
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54
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Argonne
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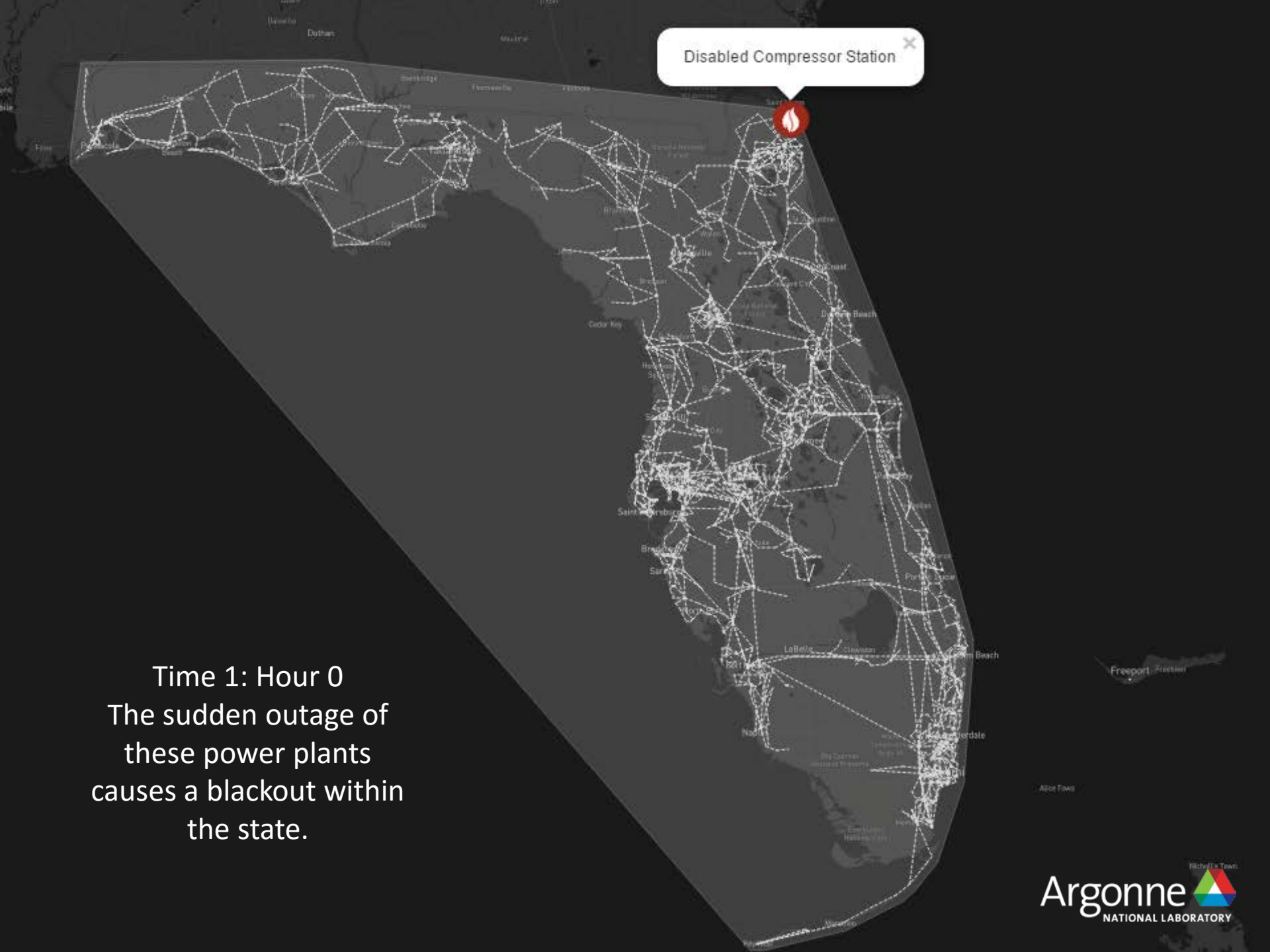

Time 1: Hour 0
The sudden outage of these power plants causes a blackout within the state.

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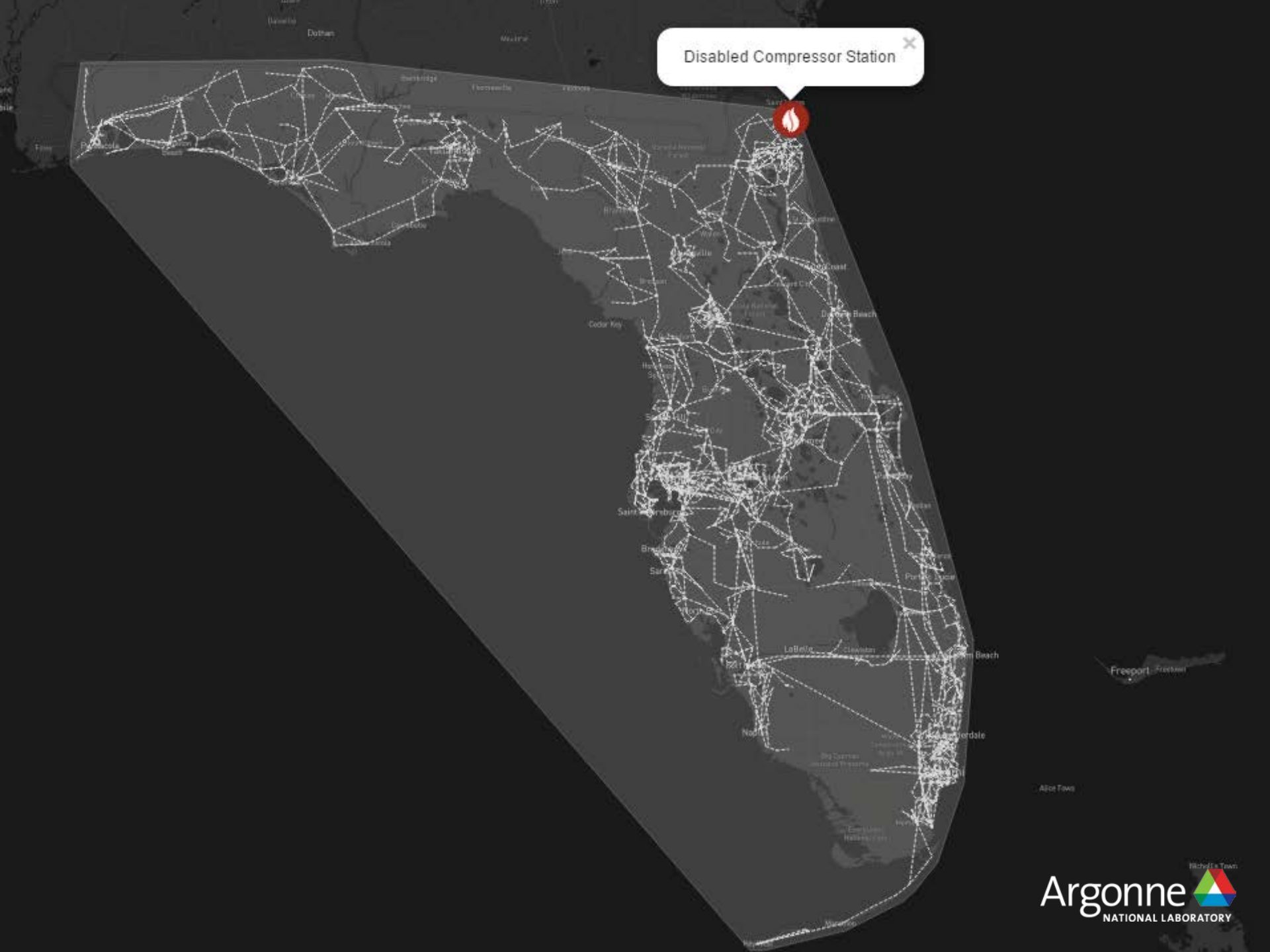
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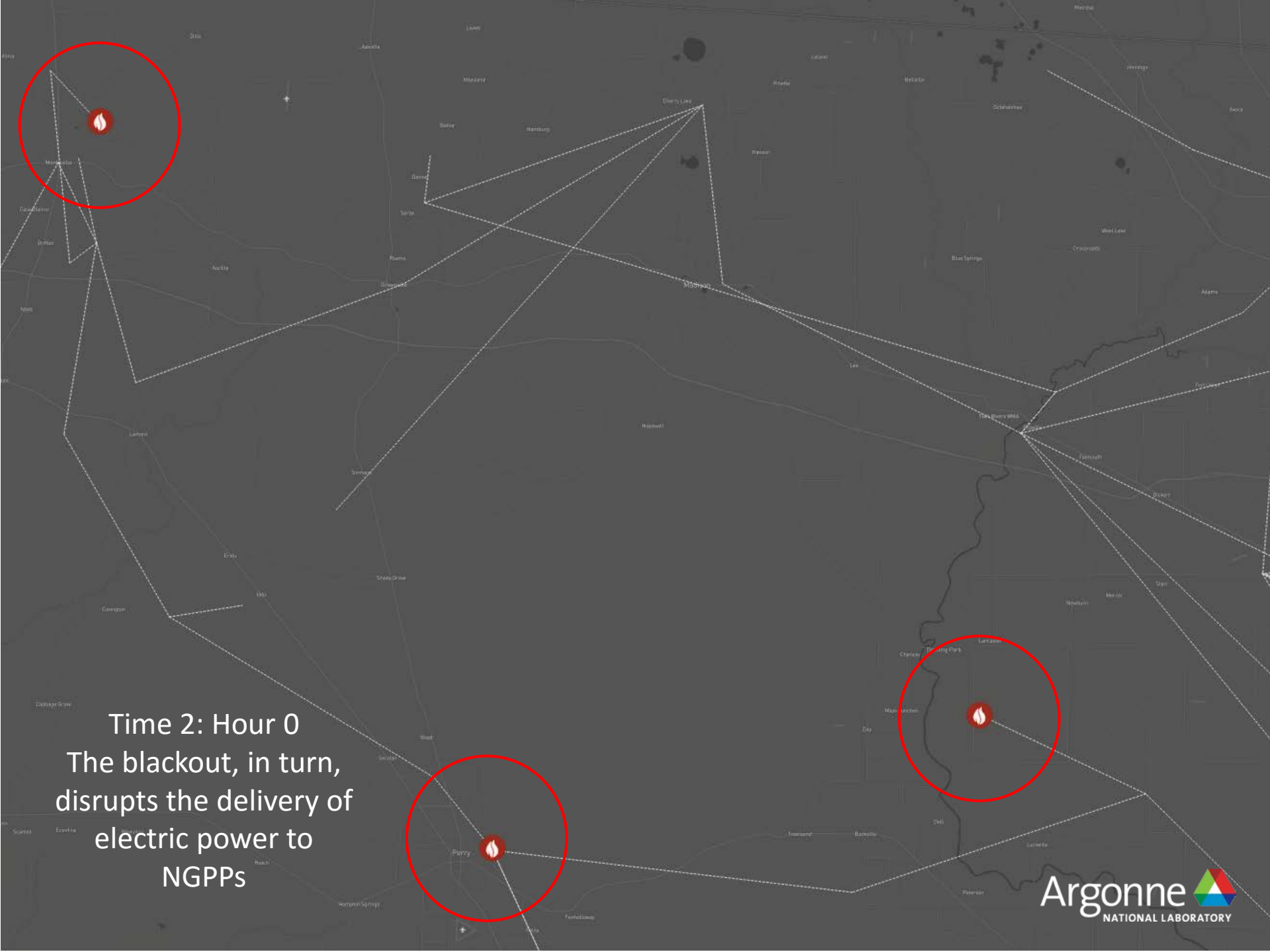
Dothan
Cedar Key
Freeport
Argonne
NATIONAL LABORATORY


Time 2: Hour 0
The blackout, in turn, disrupts the delivery of electric power to NGPPs
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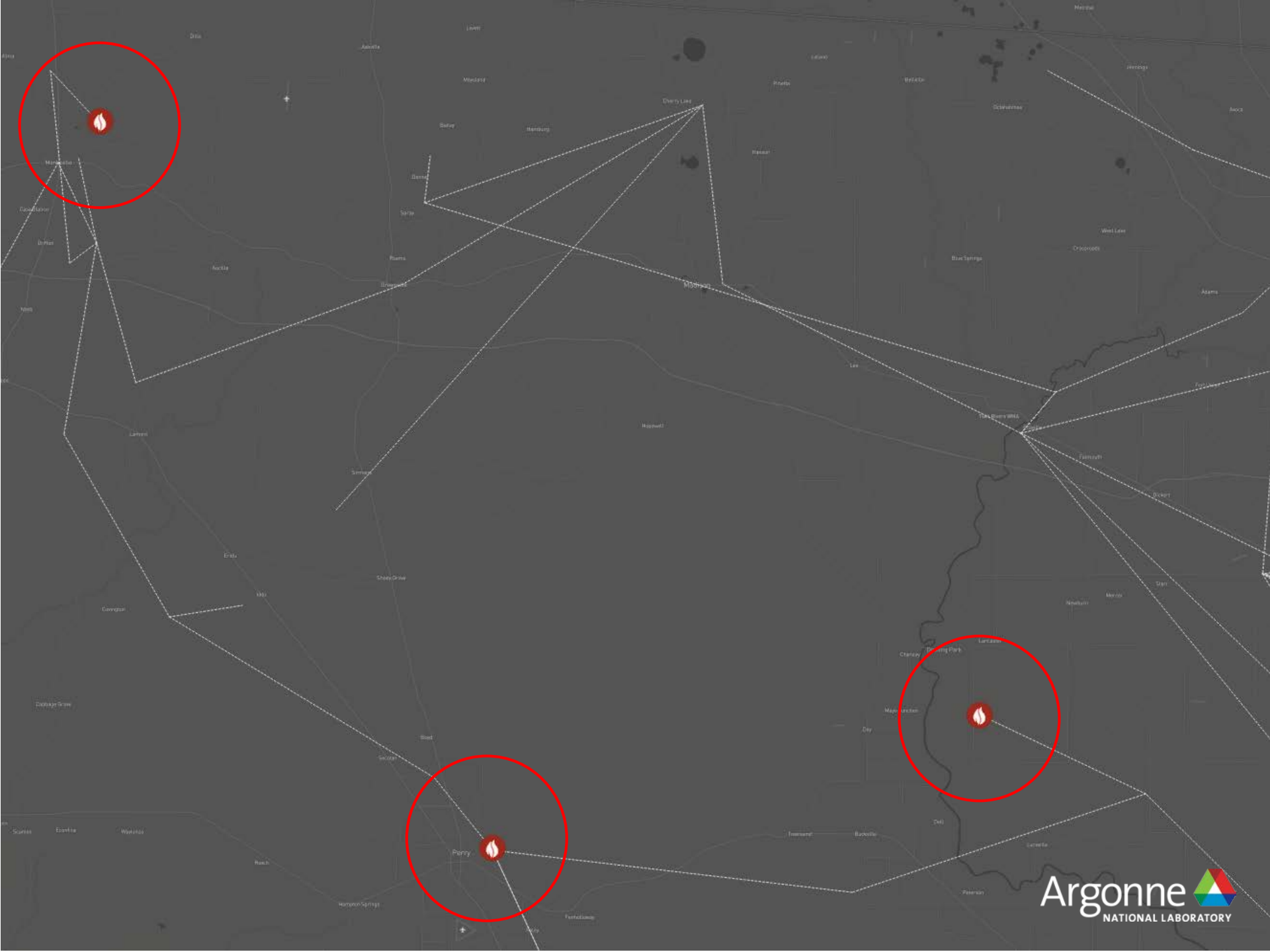
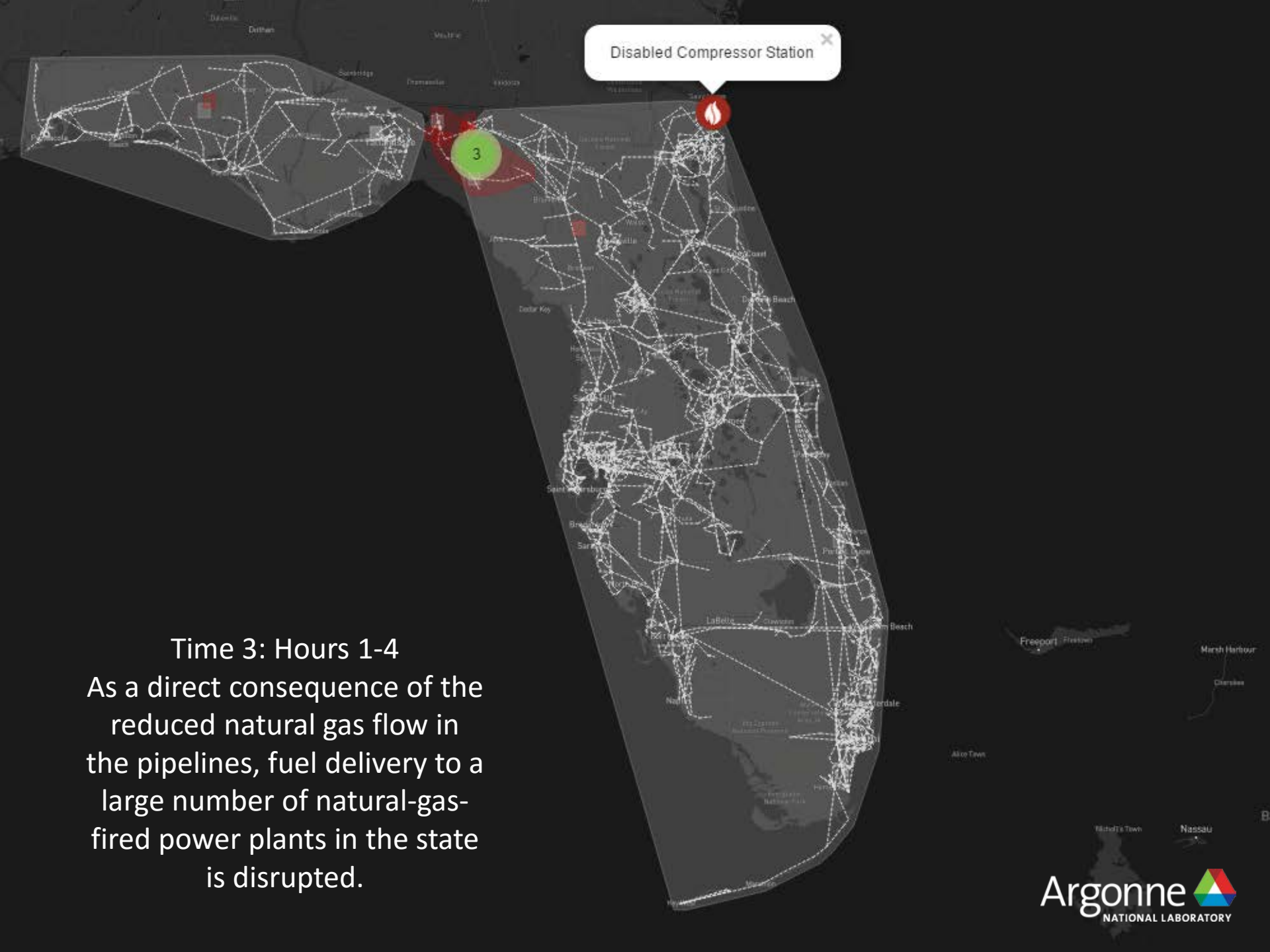

Argonne
NATIONAL LABORATORY



Time 3: Hours 1-4
As a direct consequence of the reduced natural gas flow in the pipelines, fuel delivery to a large number of natural-gas-fired power plants in the state is disrupted.

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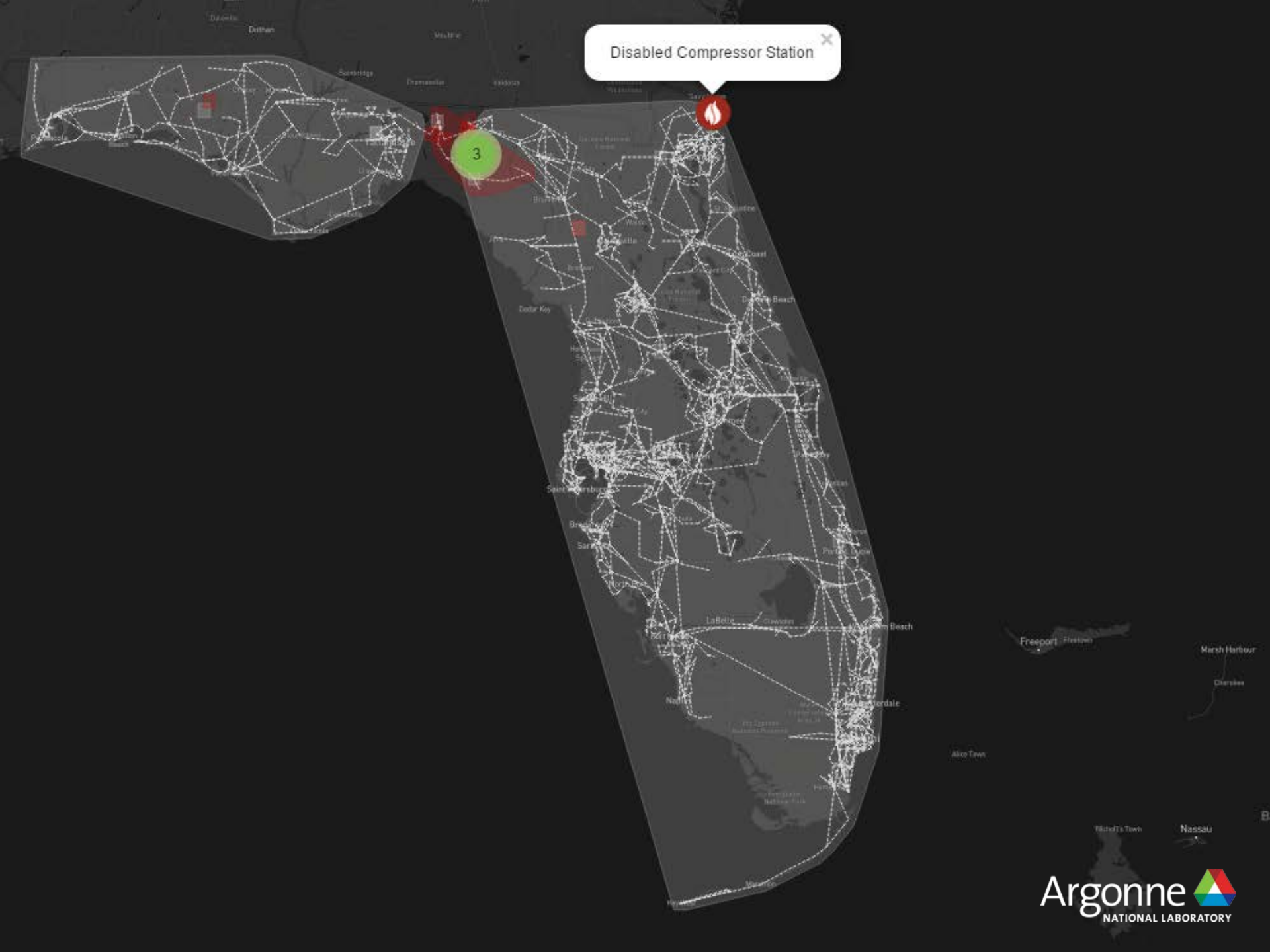
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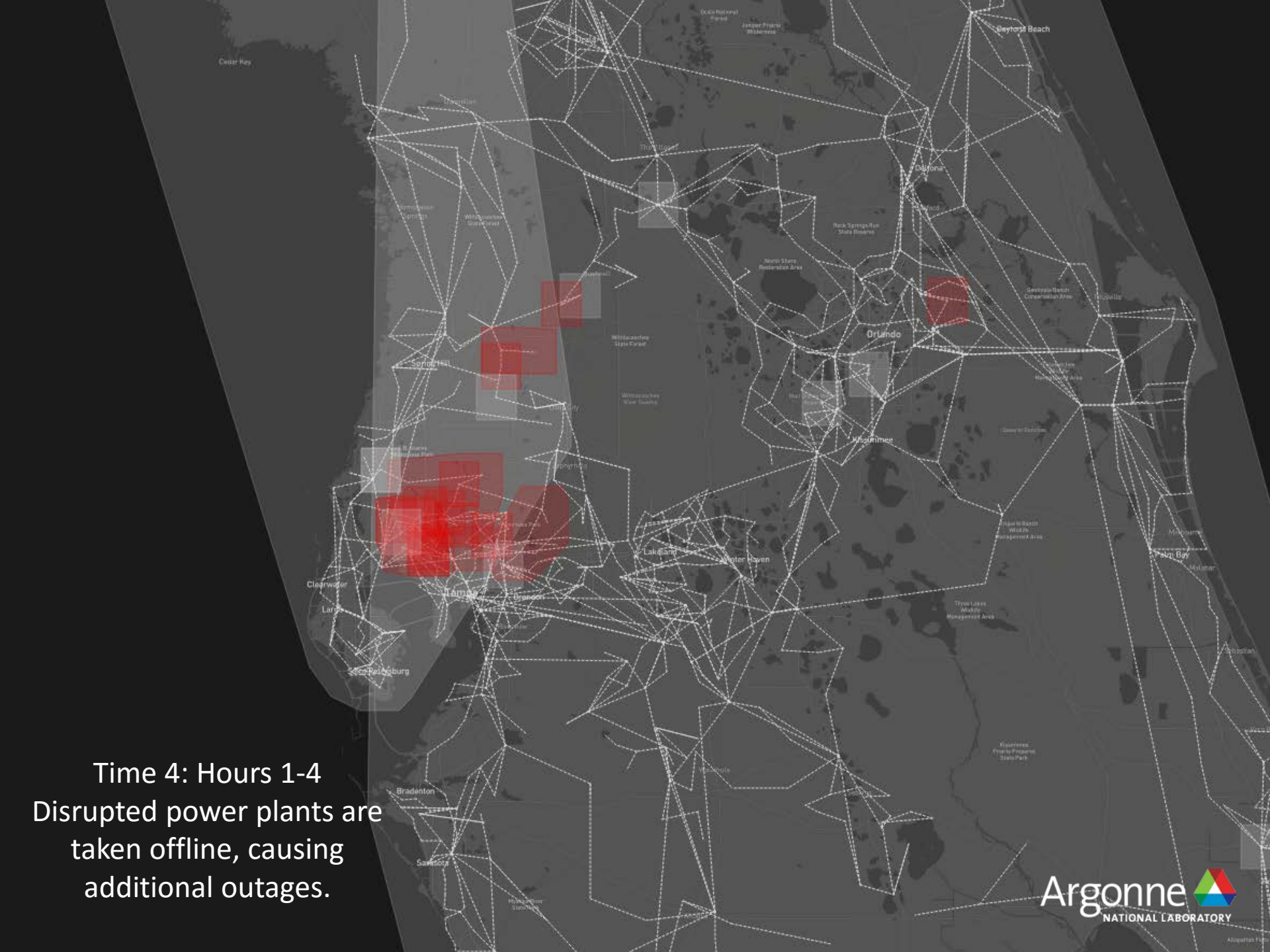
3
Freeport
Marsh Harbour
Nassau



Time 4: Hours 1-4
Disrupted power plants are taken offline, causing additional outages.

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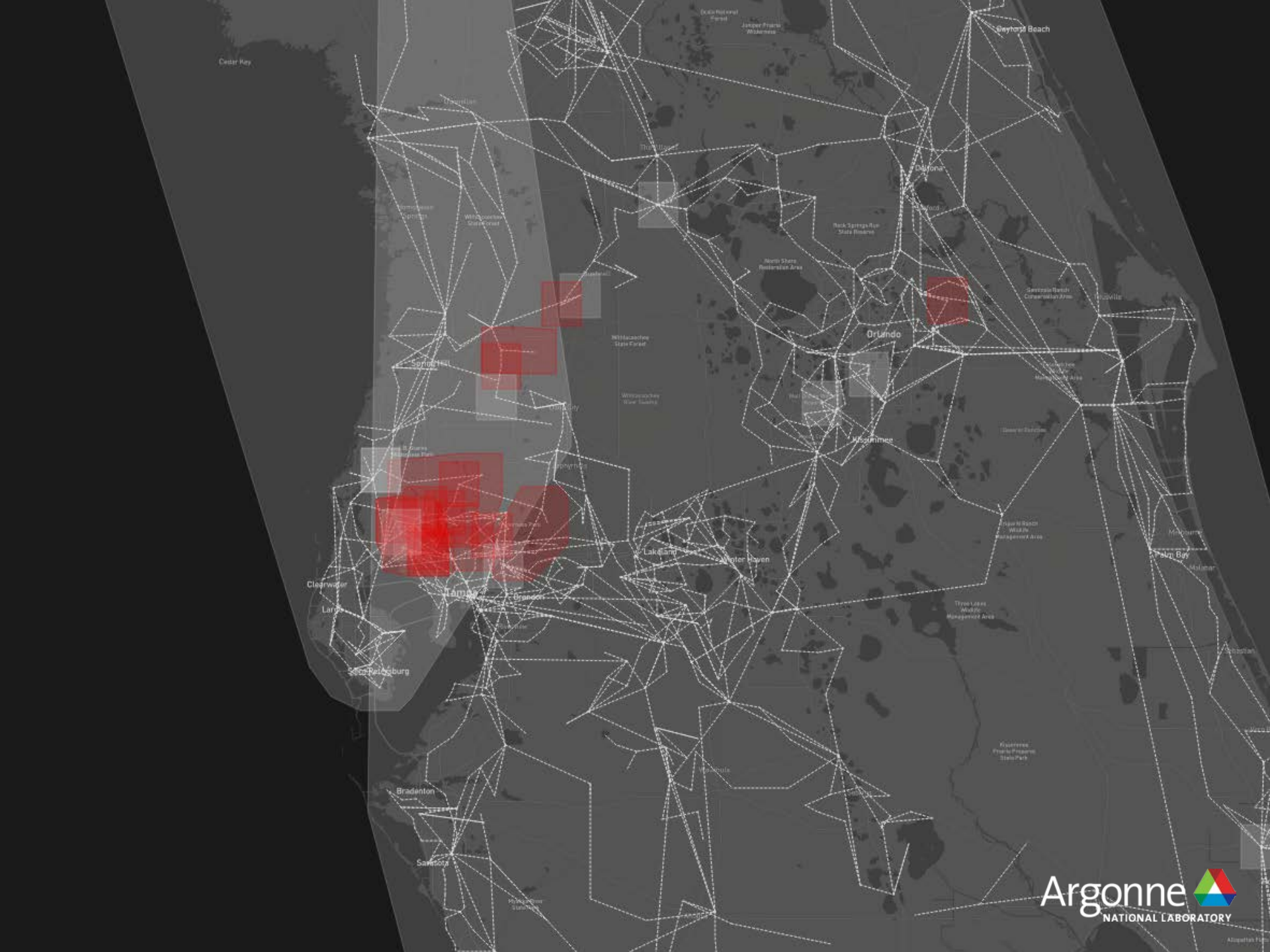
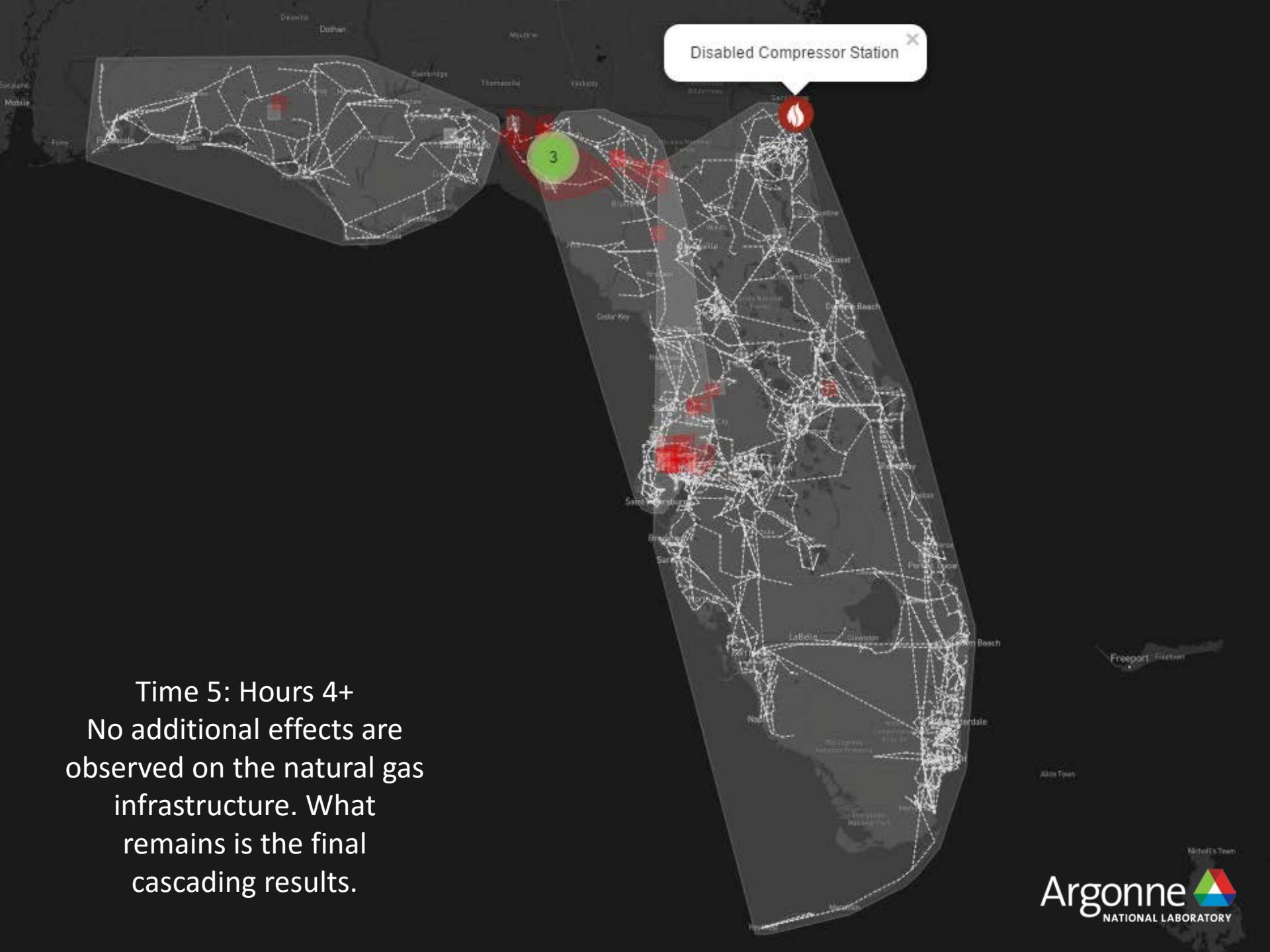

Cedar Key
Daytona Beach
Orlando
Kissimmee
Lakeland
Winter Haven
Clearwater
Tampa
Brandon
St. Petersburg
Bradenton
Sarasota
Palm Bay
Melbourne
Argonne
NATIONAL LABORATORY



Time 5: Hours 4+
No additional effects are observed on the natural gas infrastructure. What remains is the final cascading results.

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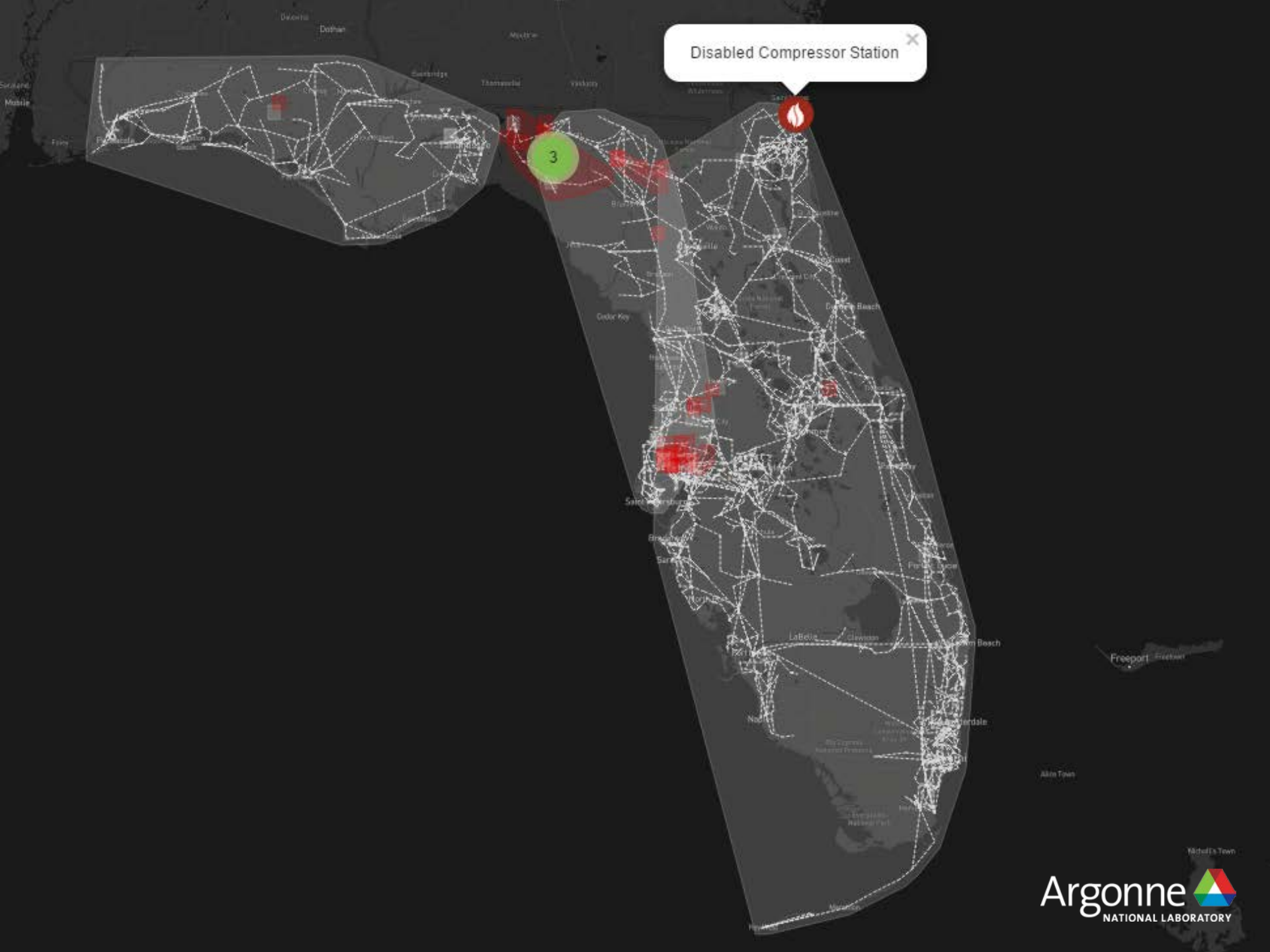
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