
AWS
re:Invent
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AIM218

Easily build, train, and deploy ML models using geospatial data

Amit Modi
Principal Product Manager
Amazon Web Services

Xiong Zhou
Sr. Applied Scientist
Amazon Web Services

Damien McCloud
Director – Geospatial & Earth Observation
Arup

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Agenda

1. Intro to geospatial data
2. Amazon SageMaker geospatial capabilities
3. Demo
4. Case study
5. Q&A

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What is Geospatial Data?

Aerial and satellite imagery (Raster)



Mapping data (Vector)



Road mask
(color as speed)



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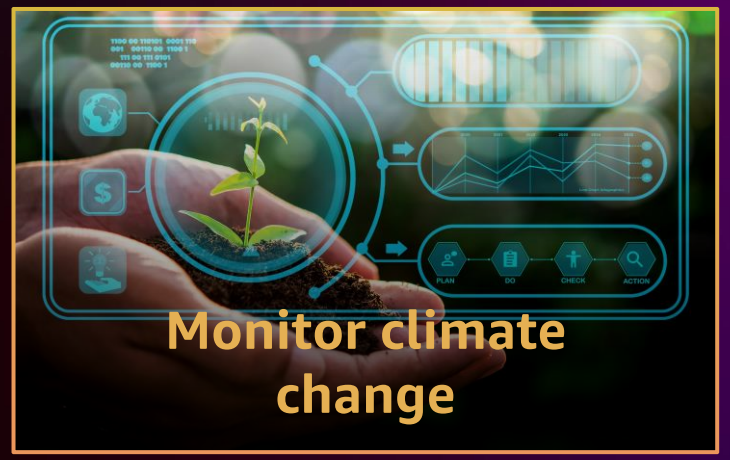
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Unlocking New Geospatial ML Use Cases



Assess risk and insurance claims


Inform trading strategies


Monitor climate change


Support sustainable urban development


Maximize harvest yield and food security


Predict retail demand

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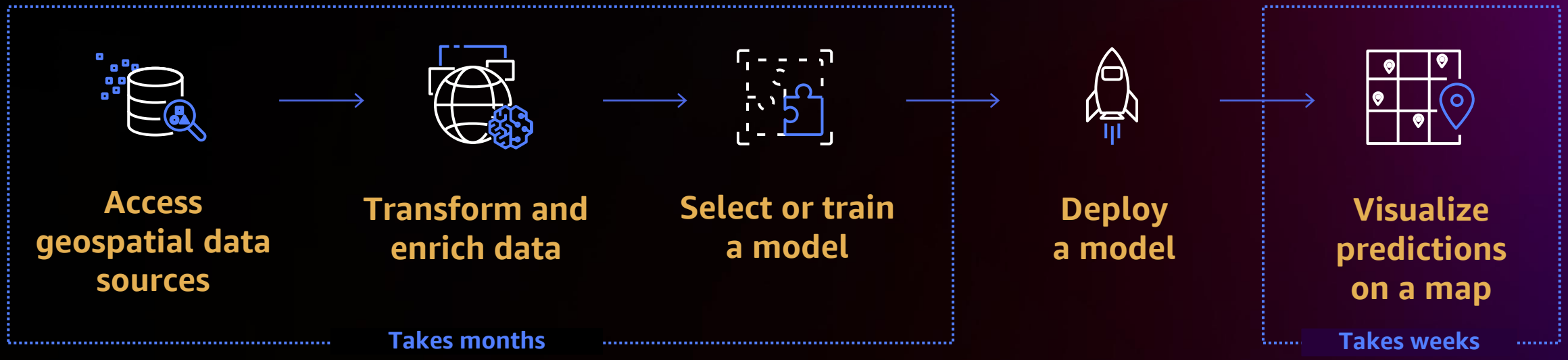
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The **majority of the data** we collect daily contains geospatial information

But only a **small fraction** is used in ML today

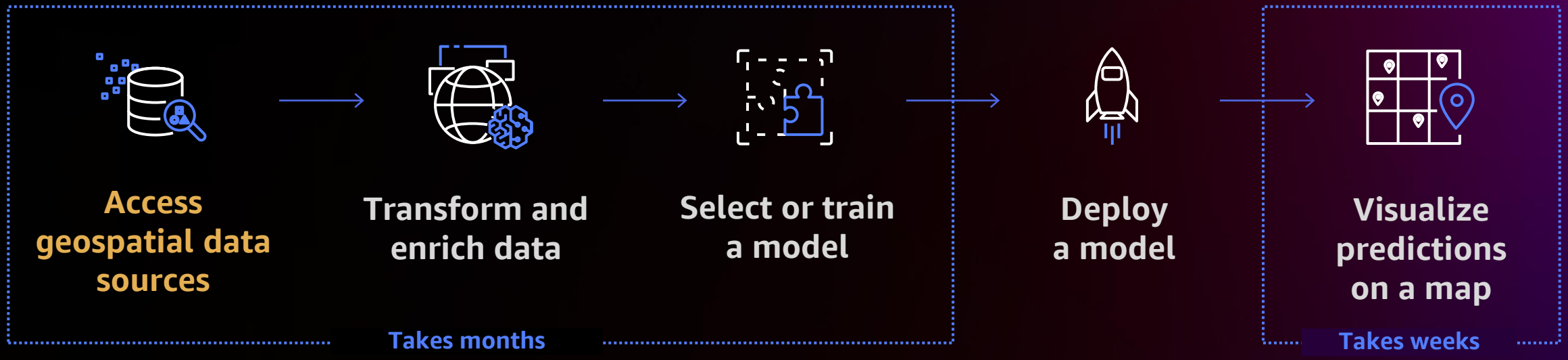
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How Geospatial ML Works



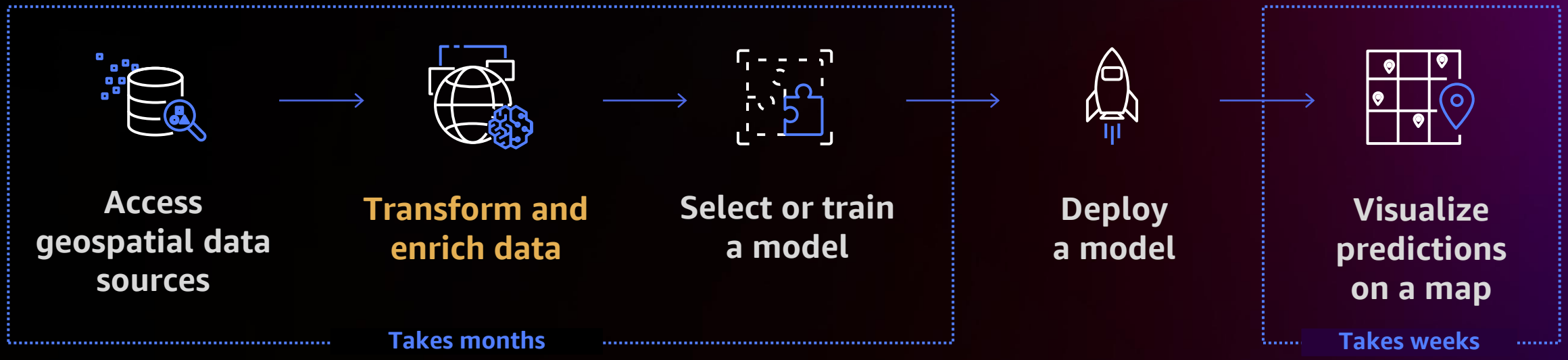
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How Geospatial ML Works



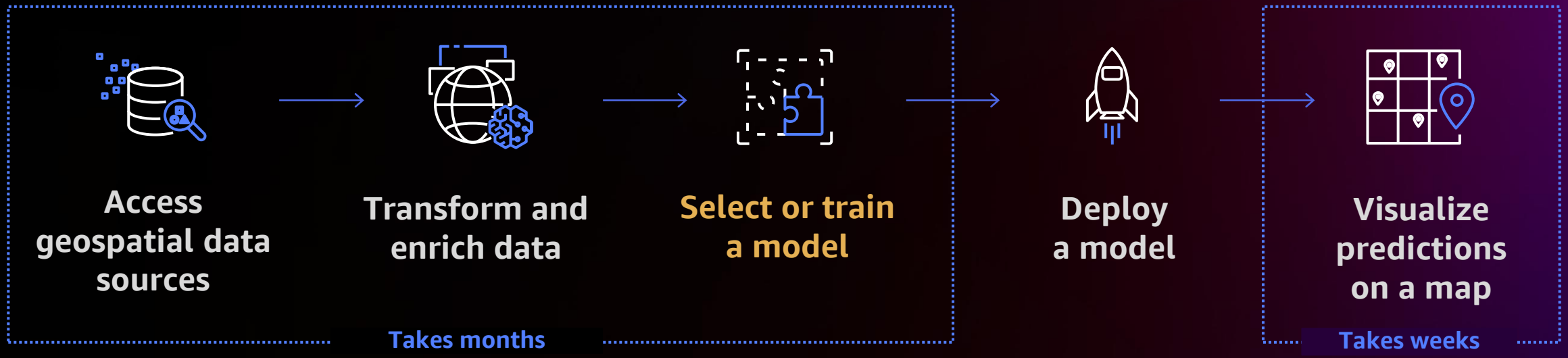
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How Geospatial ML Works



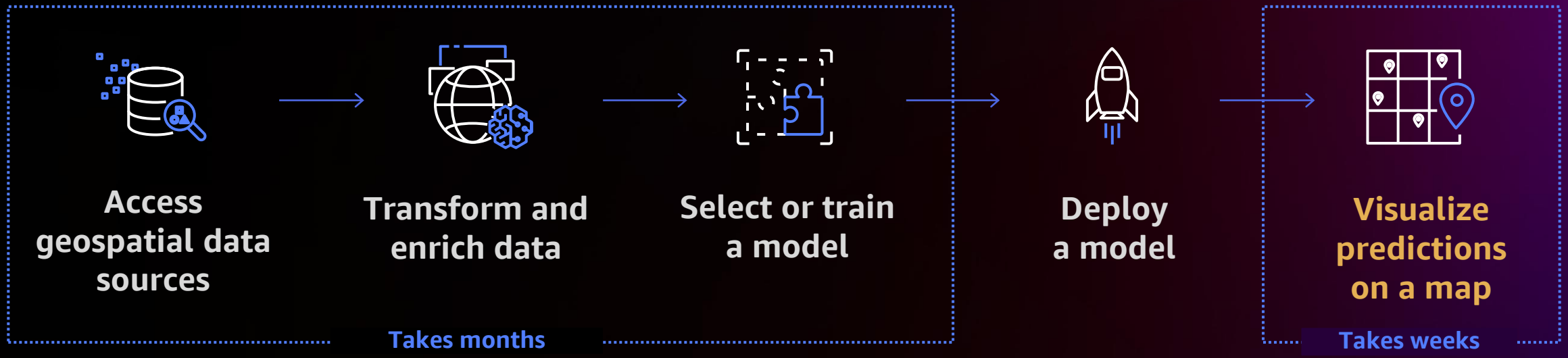
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How Geospatial ML Works



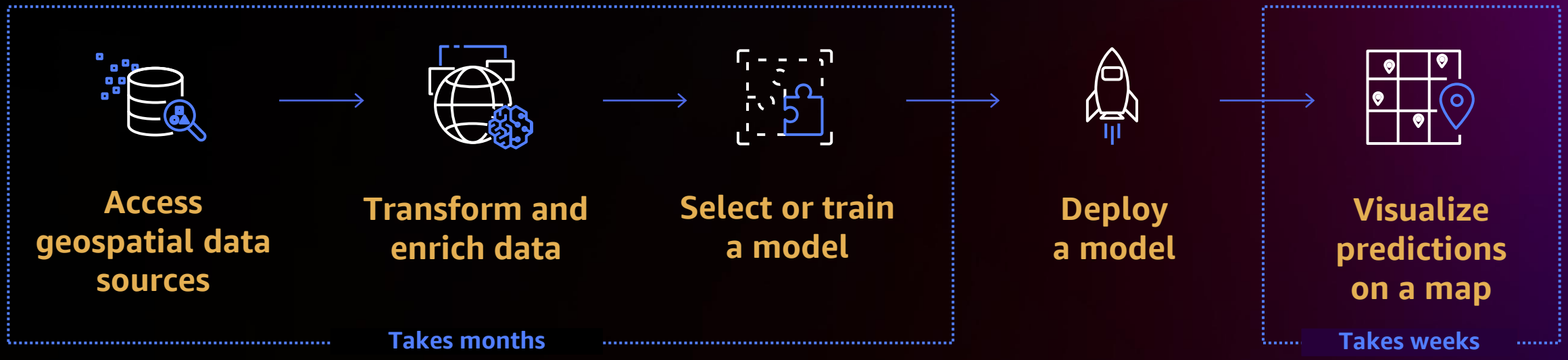
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How Geospatial ML Works



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NEW

SageMaker Now Supports Geospatial ML

Build, train, and deploy ML models using geospatial data



Access readily available geospatial data sources



Efficiently process or enrich large-scale geospatial datasets



Accelerate model building with pretrained ML models



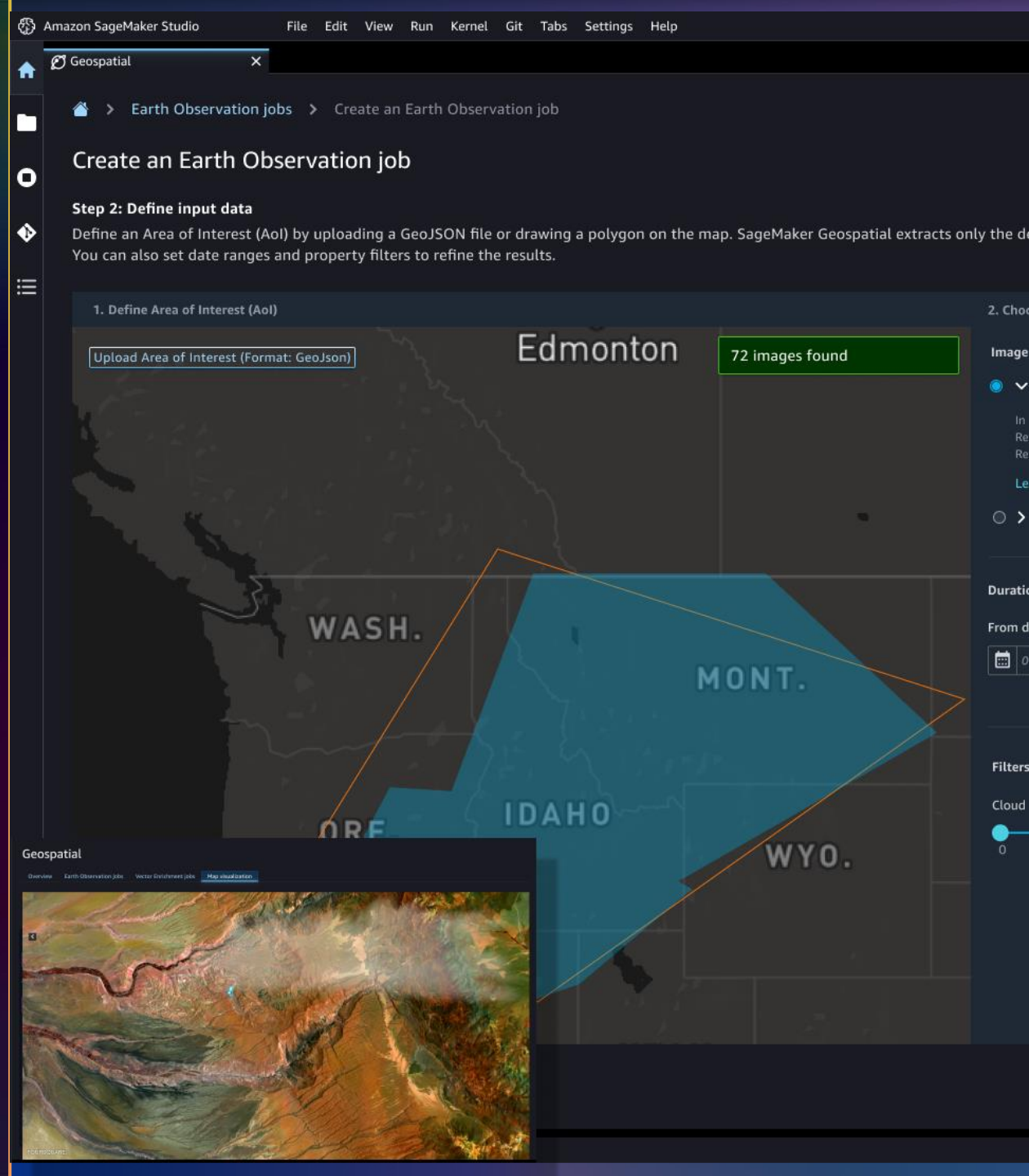
Analyze and explore predictions with visualization tools

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Access Geospatial Data

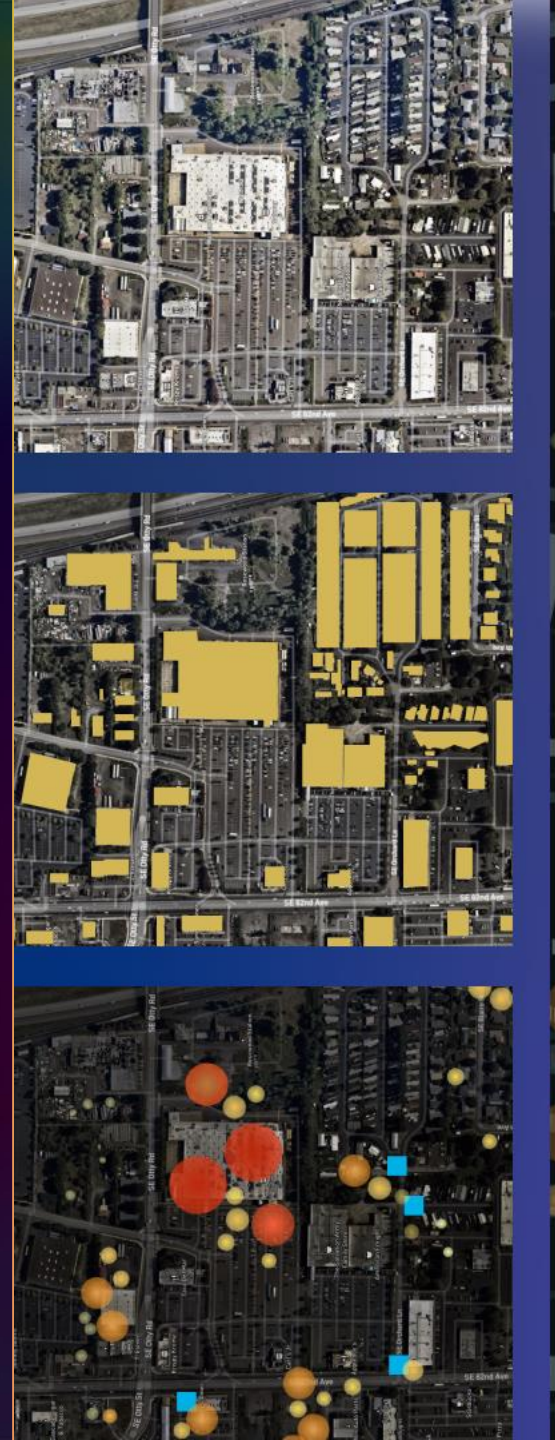
1. Open Data on AWS, such as Landsat 8, Sentinel 2
2. Bring your own satellite imagery or mapping data
3. Make your data set accessible to everyone in your organization

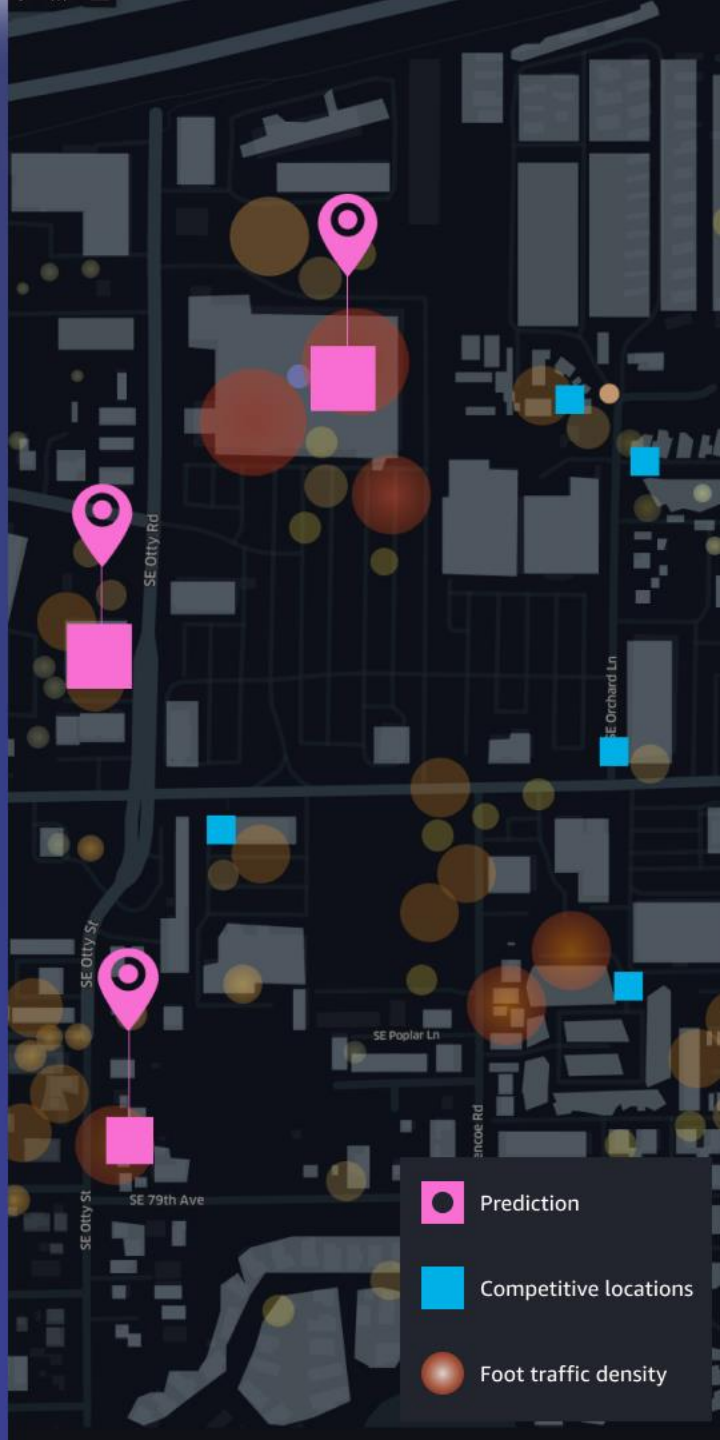


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Transform & Enrich

1. Easily available open-source libraires
2. Process with purpose-built earth observation jobs
3. Enrich map data with vector enrichment jobs

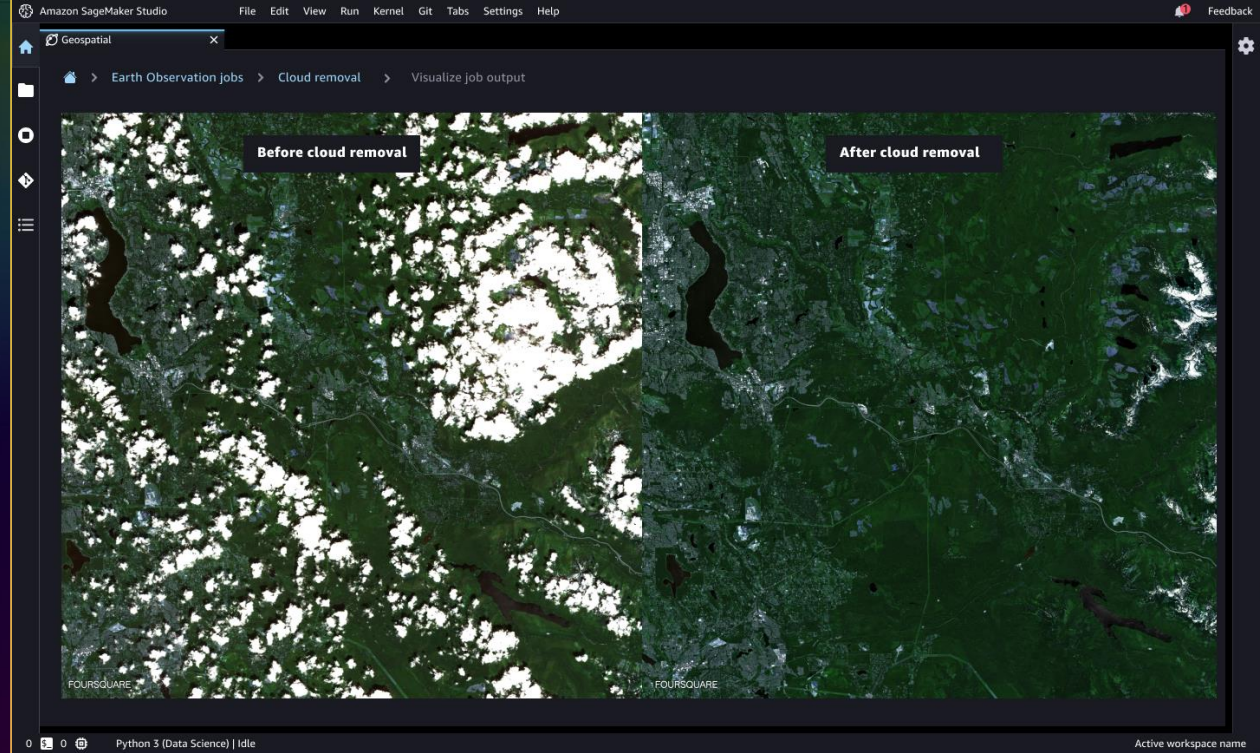




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Select or Train a Model

1. Use state of the art pre-trained models
2. Create high-quality labels for geospatial datasets
3. Bring your own model or container





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Visualize Predictions

1. Analyze and explore predictions on a map with 3D accelerated graphics
2. Visualization scales to render millions of points in the browser
3. Share predictions and map data across teams



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“Using Amazon SageMaker, we were able to improve efficiency by almost 50%. Our teams were able to set up the required model pipelines and run testing in just one to two weeks, which is almost half of the time it took us previously.”

Mojtaba Karami

Team Lead of Remote Sensing, Xarvio

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Monitoring Lake Drought with SageMaker Geospatial Capabilities

Xiong Zhou

Sr. Applied Scientist
Amazon Web Services

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Facilitating Sustainable City Design using Amazon SageMaker

Damien McCloud

Director, Geospatial & Earth Observation
Arup

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Introducing Arup

Our goals



Climate Action

Accelerate decarbonization and transition to a net zero world



Social Value

Contribute to a more equitable, just and inclusive society



Resilience

Strengthen the resilience of communities and places, and the natural systems that support both

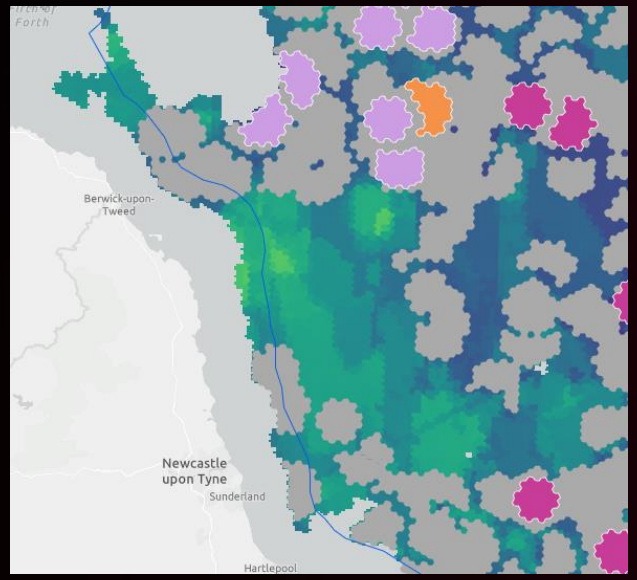
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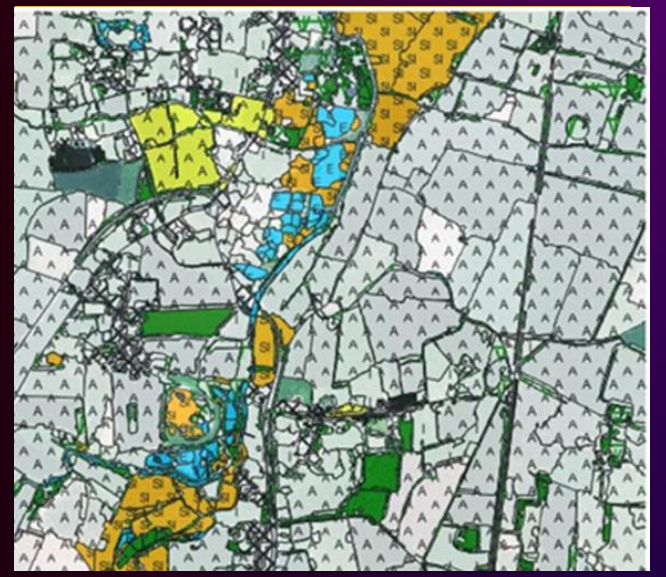
Improving Sustainability of the Built and Natural Environments



Sponge Cities Study



SCALE: Site Selection for Offshore Wind Farms



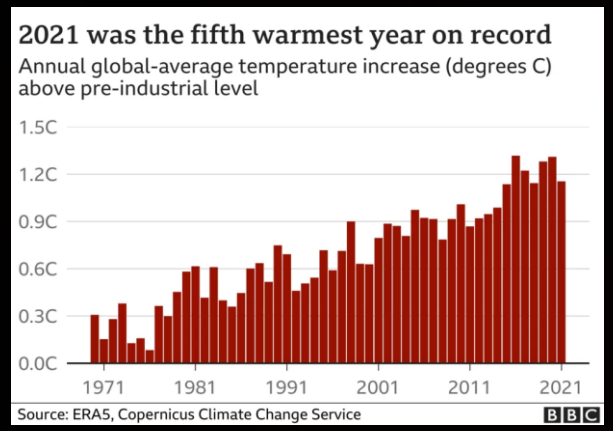
Bio Net Gain & Habitat Surveys

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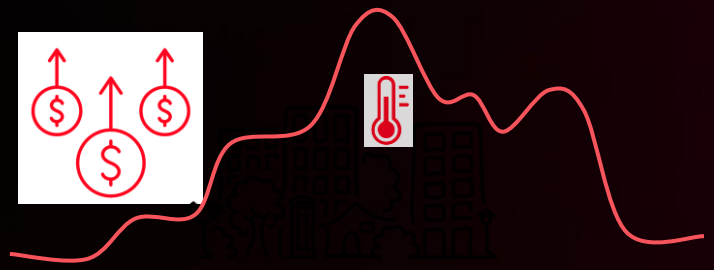
Urban Areas Experience Warmer Temperatures

Environmental



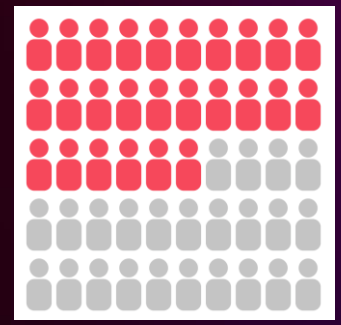
Observed an increase in heat extremes

Economic



Overheated cities face climate change costs at least twice as big as the rest of the world

Health & Inequality



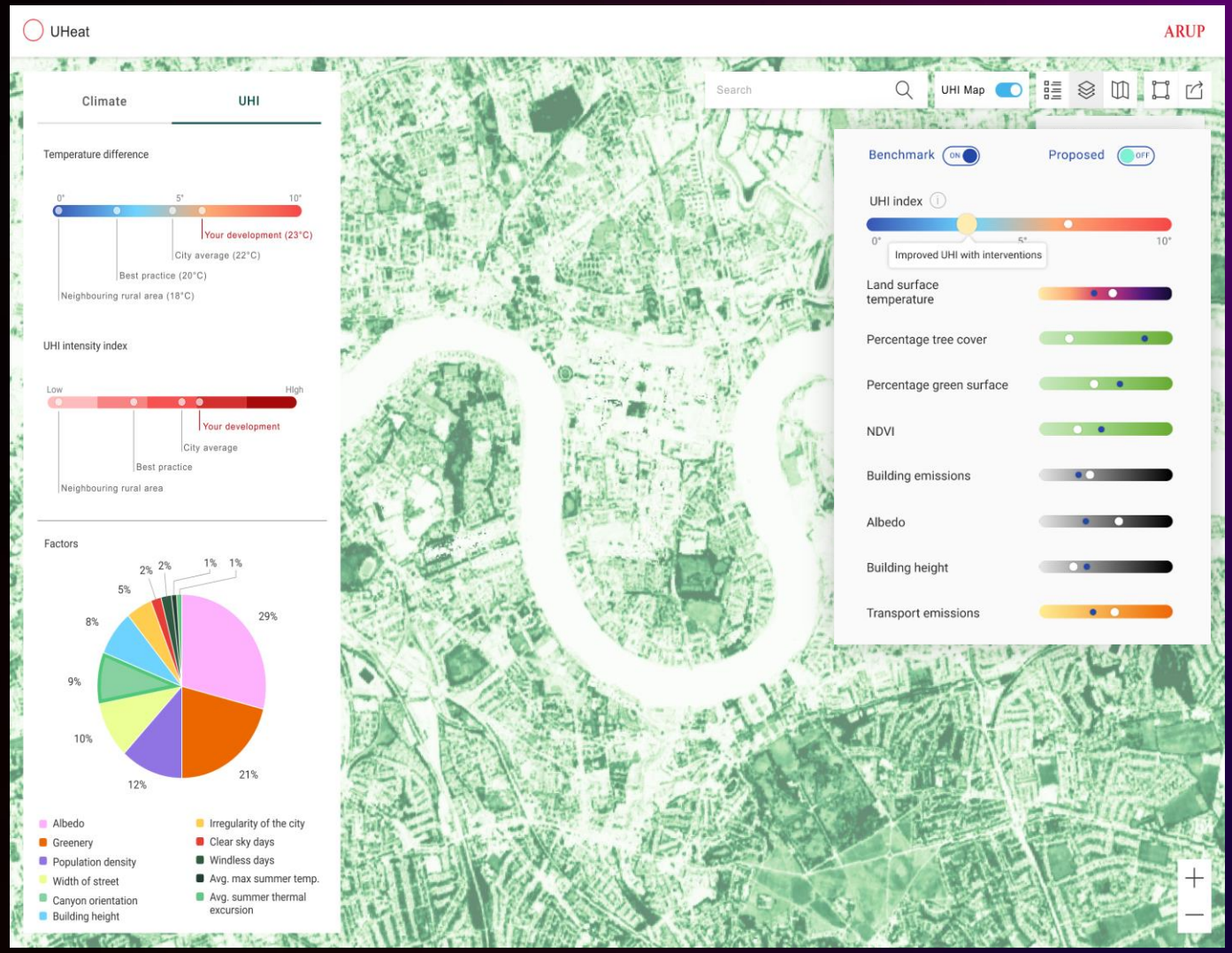
52% of the heat-related deaths that occurred during the August 2003 heatwave in the West Midlands (UK) were due to warmer temperatures in urban areas

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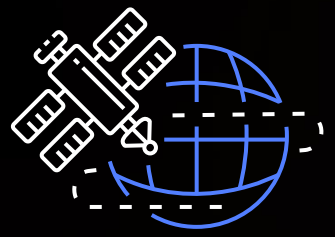
Solution for Sustainable Development

1. Temperature Difference
2. Contributing Factors
3. Urban Heat Index

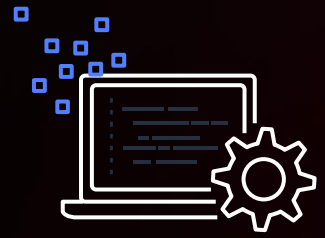


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Using Amazon SageMaker to Accelerate Geospatial ML



Easy access to open data and proprietary geospatial data



Built-in operations, pre-trained ML models, and open-source libraries



Visualization tools for geospatial data

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Outcomes

1. From Idea to Solution in 12 weeks
2. Adding many large geographic map layers simultaneously made insights significantly more actionable
3. Reduced time to process multi-year city-scale data from hours to minutes

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Key Takeaways

1. Improve accuracy of results by combining open data & proprietary geospatial data

2. Increase data science team's productivity with purpose-built operations, pre-trained ML models, and open source libraries

3. Accelerated adoption of the Amazon SageMaker geospatial capabilities inside the company by leveraging geospatial operations inside the MLOps workflow

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Get Started Today



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Thank you!

Amit Modi
modiamit@amazon.com

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