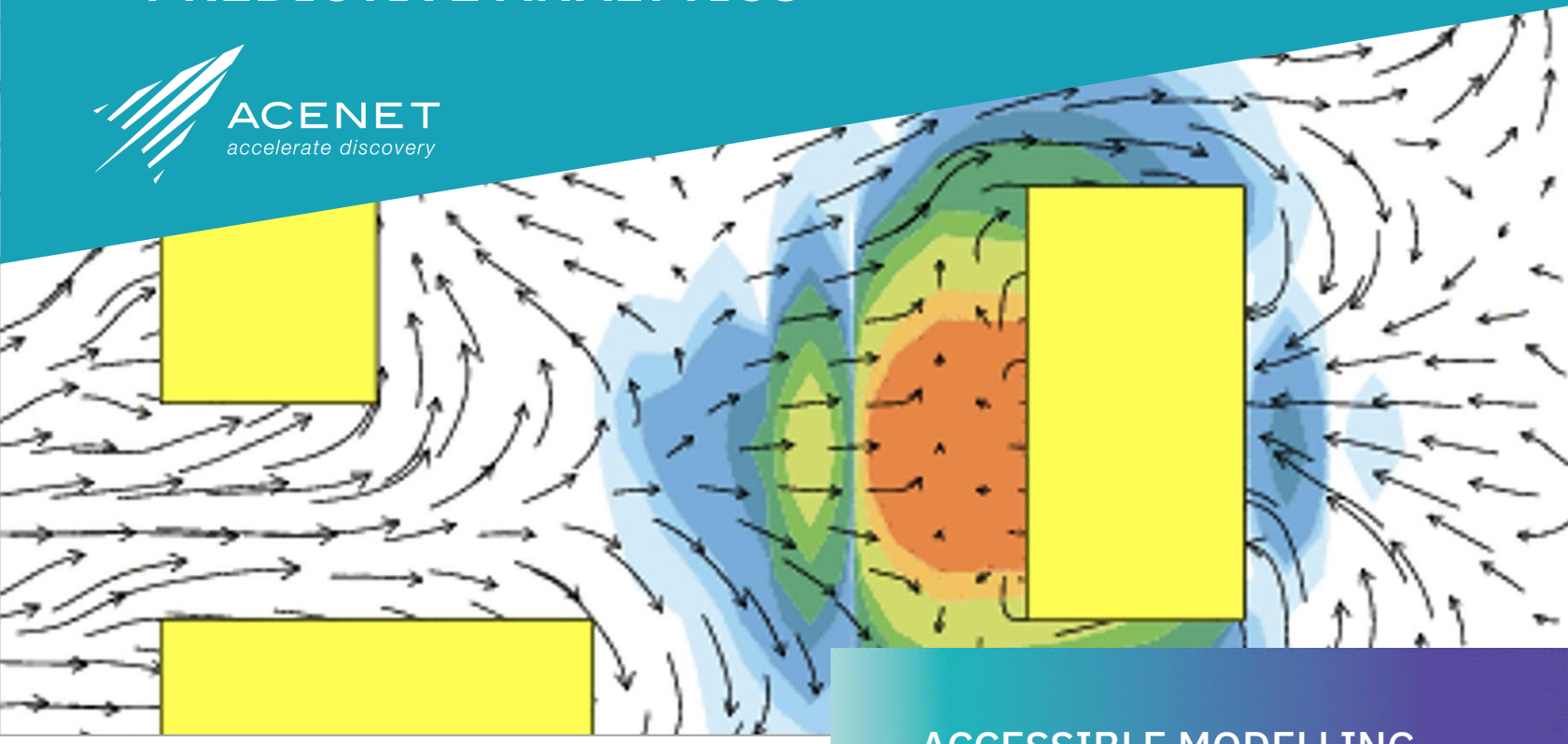
SUPERCOMPUTING FOR PREDICTIVE ANALYTICS

ACENET
accelerate discovery



MODELLING AIRBORNE CONTAGION TO PREDICT LIKELY TRANSMISSION

The Black Arcs is a New Brunswick company that focuses on predictive analytics for exploring complex land-use issues. Its engaging, interactive visualizations reflect all pertinent data, allowing users to readily manipulate key variables. Its platforms are designed to blur the line between professional analysis and entertainment, thus encouraging wider use.

Its goal? High engagement with meaningful illustrations, driving better decision-making.

The scientific back-end of the platform is based on microclimate model outputs/results, with a resolution of less than 1 metre, developed and used at a forestry and environmental management lab at the University of New Brunswick.

ACCESSIBLE MODELLING PLATFORMS FOR AMBITIOUS ANALYTICS

THE BLACK ARCS
NEW BRUNSWICK, CANADA

The Black Arcs platforms allow decision-makers with no expert scientific knowledge to consider complex outcomes, manipulating variables in a low-risk test environment. They have already been used to map economic spin-offs of music venues in different communities, and to consider how each proposed location for a new public school would affect greenhouse gas emissions.

The project supported by ACENET was the development of a visualization platform to model airborne contagion and predict community transmission of COVID-19 likely within specific environments, such as a particular entertainment venue.

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What were the computing challenges?

The models deployed use Big Data
The models deployed run Weather Research and Forecasting (WRF) simulation software, involving large, disparate data sets. The modelling efforts make use of a wide variety of continuously changing and seasonal factors such as precipitation, temperature, wind direction and intensity, and vegetation. The relevant datasets feeding these microclimate models easily run into the 10s of TB or even more, depending on the required resolution and geographical extent. Deploying these models requires the power of high performance computing (HPC).

Speed to market
To meet commercialization timelines, the platform had to be developed quickly. HPC made the analysis practical by reducing the time required to run simulations. In addition, the company could not afford long learning curves, or the time required to spin up their own virtual environments, develop efficient data exchange workflows, install and configure the software, and/or adapt proprietary code to run in parallel, on HPC systems.

Meet Siku: Atlantic Canada's Supercomputing System

- 4500 cores with Intel Cascade Lake CPUs
- NVIDIA Tesla V100 GPUs to power Artificial Intelligence or Machine Learning projects
- A high-throughput, low-latency EDR Infiniband interconnect
- Both batch and cloud-computing interfaces
- 1.5 PB parallel filesystem and regular back-ups
- JupyterHub, for graphical exploration of your data with R-Studio or Python, and a virtual desktop in your browser

How did ACENET help?

Easy access with a short timeline to output
ACENET provided speedy access to its advanced computing cluster, Siku.

Responsive, expert support
ACENET's technical staff responded quickly to any problems we experienced.

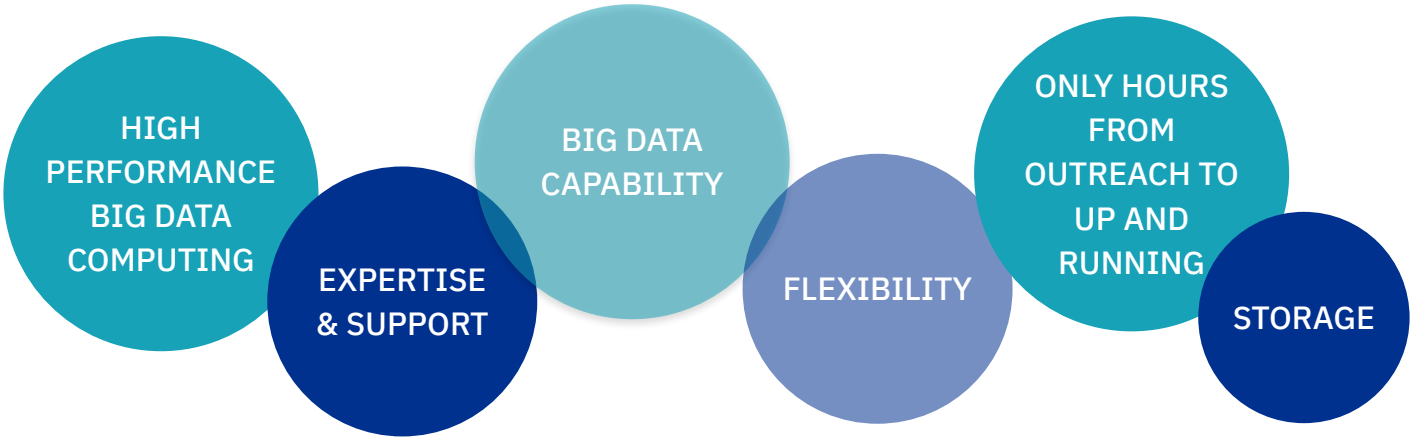
> "ACENET had us up and running within hours, before any other component was in place. They made it easy."
>
> JAKE ARSENAULT, CEO, THE BLACK ARCS

Training and Consultant Services
It's reassuring to know that we had access to scheduled training sessions, customized course content, or timely consultations with local technical experts.

What was the outcome?

Alert to widespread interest in understanding and inhibiting transmission of airborne contagions such as COVID-19, The Black Arcs is pursuing commercialization in parallel with ongoing R&D, and is currently working with ArtsLink NB.

HOW ACENET CONTRIBUTED



LET US SHOW YOU HOW YOU CAN ACCELERATE YOUR PROJECT