Data to the rescue of habitats

Ducks Unlimited Canada goes hybrid to maximize its conservation efforts and resources

The conservation and restoration of Canadian wetlands is a massive undertaking. Scientists need to know not only where those habitats are but also how factors like sunlight, temperature, and vegetation influence the delicate balance required to protect the population of waterfowl and other wildlife. That's why Ducks Unlimited Canada (DUC) takes a science-based approach, leveraging data and technology to inform and track its conservation efforts on over 6000 acres across the country. With a hybrid cloud environment, the organization is making the most out of every data point, scaling AI models to accelerate insights, and expanding its positive impact.

Ducks Unlimited Canada

Customer: Ducks Unlimited Canada
Industry: Research
Country: Canada

Preserving habitats and life

The environmental work of DUC goes beyond protecting waterfowl. Its efforts to conserve and restore wetlands and other habitats have a positive effect on entire ecosystems, the wildlife within them, and the communities and visitors of those areas.

"We're interested in climate resilience, carbon sequestration, water chemistry, and water quality. These ancillary benefits come along with protecting and restoring wetlands," says Andrew Pratt, director of information technology at DUC.

The nonprofit conservancy organization has 500 staff and thousands of volunteers supporting scientific research and conservation projects through fieldwork, gathering and analyzing data, or fundraising.

Science-based conservation

Pratt shares one of DUC's core principles: "We are a science-based organization. What we do and where we do it is constantly evolving as our science improves, so we can be very focused on the work that we do."

An example of this science-based approach is DUC's decision support system. This comprehensive map helps identify the critical prairie areas to foster positive outcomes, including waterfowl breeding success, considering factors like grassland and wetland abundance. This information is then used to drive conservation policies and programs where efforts can be most impactful.

All that science and knowledge-based information is backed by millions of data points. "We manage 13,500 projects. We have over 6 million acres in our database, and it's growing rapidly every year. That's a lot of data that we have to protect," says Pratt. "This data is used every day by field staff and management, so we have to make it readily available from any place."

Vision
Maximize the positive impact of conservation efforts for Canadian wetlands and waterfowl

Strategy
Leverage a hybrid cloud strategy to enhance cost efficiency, accelerate data insights, and simplify IT operations

Outcomes
— Delivers cost efficiency to process, store, and backup ever-growing geographic information system (GIS) data for conservation projects

— Powers machine learning to create comprehensive wetland mapping of Canada

— Allows to focus efforts on the highest-impact areas and projects through data insights and seamless management

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Andrew Pratt, Director of Information Technology, Ducks Unlimited Canada

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A deep look into ecosystems

To get a clearer picture of the state of ecosystems, DUC collects and analyzes a wide range of data on its GIS. Sources like Light Detection and Ranging (LiDAR) systems, satellite imaging, and property boundaries help researchers and scientists go deeper than wetland location, telling a complete story of how habitats are transforming throughout the days, seasons, and years.

"Wetlands are very dynamic. The most valuable data tells us what's changing and when rather than taking a snapshot in time." Pratt explains. "If you can collect data on a more continuous basis, you have a much deeper understanding of what's going on. That data is now starting to flow in through IoT devices into our data centers."

Flux towers are one example. These devices monitor gas emissions on wetland complexes in a continual way. Scientists can then use that data to understand carbon storage processes within the ecosystem, and how these are influenced by factors like wetland vegetation abundance and temperature changes through the day and seasons. While data collection happens at the edge, all that information needs to be processed to gain true insights from it.

Making donation dollars count

As a nonprofit organization, DUC needs a strong fundraising strategy to get the expertise and technology it needs to achieve its objectives.

"Data can certainly help us evolve in the conservation space, but also in fundraising and marketing," Pratt states. For example, DUC can leverage zip code data to learn more about our supporter demographics and improve our marketing ROI.

The organization must also find ways to drive efficiencies and maximize the value of every resource it gets. That's why, when DUC needed to modernize its IT environment, it partnered with Hewlett Packard Enterprise to find a solution that aligns with its cloud strategy.

"Dollars are always hard to come by, and the ones we do get often have very stringent requirements on what can be spent on admin overhead, which includes IT," relates Pratt. "We have to be extremely prudent in how we're spending our unrestricted dollars. HPE GreenLake certainly helps when we can consolidate some of those costs."

The right fit for every workload

DUC follows a cloud-first model, leveraging public cloud solutions for enterprise resource planning (ERP), HR, sales, and finance functions. This strategy enables scalable growth for the organization.

Still, Pratt is aware of the workloads and data where public cloud is not a good fit. "Cloud offers its benefits, but it's not always the most cost-effective," he explains. "Our GIS workloads are very large datasets. They're shared across our field offices, there's a lot of transactional data. So, it makes more sense to run that in our own data centers. That's what kickstarted this journey."

That journey's destination was hybrid. By adopting HPE GreenLake for Private Cloud Business Edition, DUC can run GIS and other workloads on-premises while still getting a cloud-like experience that is flexible, scalable, and easy to manage. The solution, which includes HPE Alletra dHCI and HPE ProLiant DL360 Gen11 Servers, delivers the storage, compute, and networking the organization needs to operate with efficiency.

The solution is deployed at DUC's data centers located in Alberta and Manitoba and enables access to data and workloads across its 25 field offices and at the edge. "I have a very lean IT team, so having HPE GreenLake Private Cloud Business Edition really makes the orchestration layer that much simpler. Everything is nicely displayed for us in one pane where I can easily see what's going on," Pratt states.

In addition, HPE ProLiant DL360 Gen11 Servers deliver energy efficiency, resource consolidation, and high performance, supporting DUC's computational demands for diverse applications while aligning with the organization's sustainability goals.

Intelligence-powered research

As science and our knowledge evolve, so do the technologies that support them. DUC is taking advantage of machine learning to get more precise and faster insights.

One of the use cases for machine learning is building a comprehensive inventory of all the wetlands in Canada, the only G7 country that doesn't have a complete national inventory. "A wetland layer will help us understand where we are losing or gaining habitat. Using the old methodologies is very manual labor, and that's where deep learning AI tools are really coming into their own," Pratt shares.

These models are running on virtual servers through the HPE GreenLake cloud. The solution also enabled Pratt and his team to repurpose existing servers for compute-heavy remote sensing GIS workloads, which also leverage deep learning tools.

Pratt is also looking forward to other ways of adopting AI to maximize the value of the research data that DUC has amassed throughout more than 85 years of operations. "Pushing our data to the cloud to run AI tools has made me quite nervous and has slowed our AI adoption because of privacy concerns," he says. "If we can pull all that back and run AI on our own data centers, that is of great appeal to me."

Security is top of mind

Keeping all data and workloads secure has increasingly become a priority for Pratt and his team. "Fundraising requires very sensitive data that falls under certain regulations and legislations. From a cybersecurity perspective, it's our most valuable data," he explains. "So, if I have a choice between sending my team to maintain and manage our storage arrays or implement the latest security tool, I'll take security every day."

With simplified management and monitoring of its private cloud environment, DUC can focus its efforts and resources on high-value tasks.

Other factors that strengthen security are HPE Aruba Networking ClearPass, which helps enforce secure access control through role-based network policies, and HPE Aruba Networking Central, delivering unified network management. "A hundred thousand people come through our headquarters every year. It's a public building, so we made sure to protect both the wireless and wired networks," Pratt relates. "Now, when people plug into a port, it's directly onto the guest network. Aruba allows us to do that quite simply."

Work that matters

For Pratt, it's all about empowering technical and research teams for a larger cause. "I would like to unlock capacity from my team to do more with the limited cycles that we have. I want them to focus on things that interest them and make meaningful change," he says. "We have positively influenced millions of acres for all kinds of health benefits to people, plants, and animals. And that resonates well with me. I can look back at my career and see I've done something that matters."

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