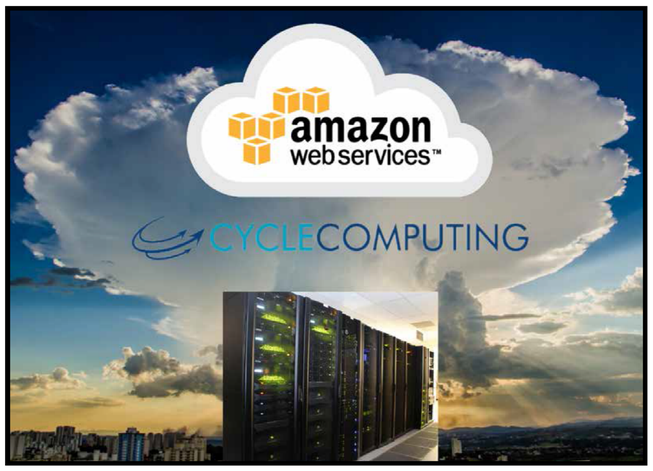
# Bursting Into Public Clouds For High-Performance Analytics




Cloud bursting balances processing load across local and cloud-based resources. The NASA Center for Climate Simulation (NCCS) has conducted a "proof of concept" using satellite imagery to count trees and calculate stored biomass in the Sahel region of Africa.

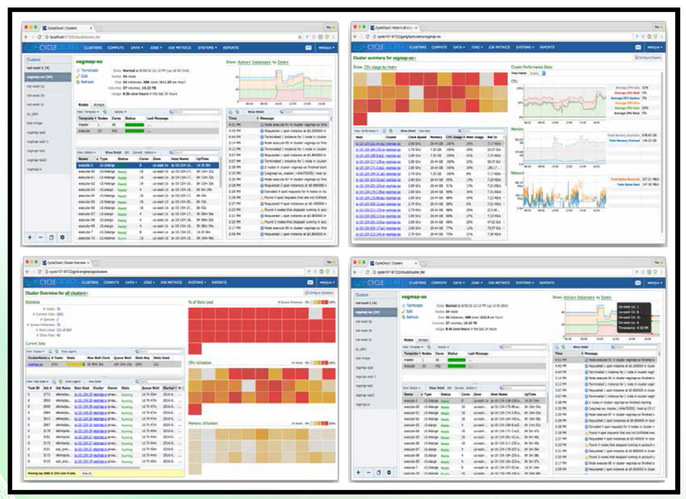
The NASA Center for Climate Simulation (NCCS) is working to leverage the power of onsite resources coupled with cloud-based assets to expand—on a dynamic basis—the computational power afforded its user population. The objective of this "cloud bursting" is to demonstrate automated overflow processing from the NCCS Advanced Data Analytics Platform (ADAPT) to Amazon Web Services (AWS) using the SubmitOnce component of Cycle Computing's CycleCloud provisioning tool.

The test case centers on using high-resolution satellite imagery and custom processing algorithms to identity and count trees and shrubs within a coast-to-coast swath of Africa from the Sahara south to the savanna zones. This biomass estimate will reveal how much carbon is stored in the region's vegetation that could be released as carbon dioxide if those plants burn or die and decompose due to natural or human causes and thus have direct impact on the region's climate.

- Satellite imagery is organized into 11 Universal Transverse Mercator (UTM) zones, which are roughly 658 by 1,334 kilometers (km) each. UTMs are further broken down into 100- by 100-km tiles.

- Seamless sub-tiles with image distortions removed are created on ADAPT and then transferred to AWS for the biomass calculations. The batch queueing system in ADAPT communicates with its elastic twin in AWS, enabling Cycle Computing's tools to move data and initiate processing. As individual jobs complete, results are automatically transferred back to ADAPT.

The Cycle Computing tools allow users to control and monitor processing as work migrates from local assets to Amazon Web Services (AWS) cloud-based resources.



The flexibility of the NCCS ADAPT system backed by the relatively infinite AWS resources potentially redefines the traditional science-processing platform. Processing algorithms can be curated on local assets and then hosted in AWS when users want to process large data stores and need many cloud instances to complete processing in a reasonable timeframe.

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