



NSF Award: 1925001

## Managed Services to Simplify Cloud Access for Computer Science Research and Education

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**Strategic Blue**

# CloudBank seeks to address pain points of researchers and educators using public cloud

***“Setting up your first experiment in the cloud is too time-consuming, and different for each cloud platform.”***

*“I need documentation specific to my research.”*

*“Provisioning all students in a class with their own cloud credits and dealing with their cost overruns is a major pain. Financial losses can be substantial if students are given free reign.”*

*“There is no simple way to run multiple experiments with software already installed in one instance.*

*“Research credits are difficult for us to keep track of.”*

***“We need billing help. It’s opaque as to what is going on and I don’t have the time to wade through this.”***

*“Cloud is just not designed for typical use case of a small research group.”*

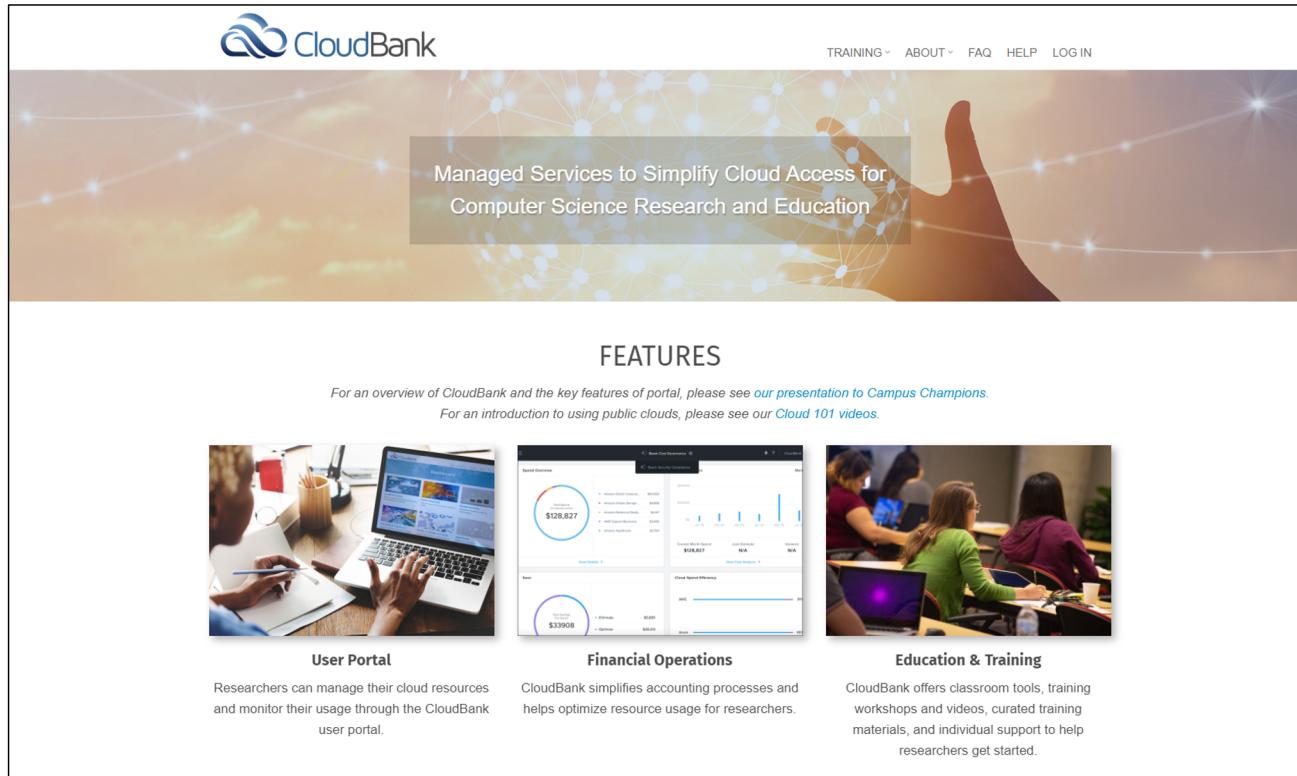
*“We need an expedited process for setting up experiments very quickly. Often we use cloud resources when we’re on a deadline so quick setup is critical.”*

***“I just don’t have enough time to learn all this. Can you give me a jump start?”***

*“It’s a Hobson’s choice between giving everyone root access or losing my life in fine-tuning access.”*

*“Cloud is a serious learning curve. Just too much documentation, and of the wrong type. Students get lost.”*

<http://www.cloudbank.org>



The screenshot shows the CloudBank homepage. At the top, there's a navigation bar with the CloudBank logo, TRAINING, ABOUT, FAQ, HELP, and LOG IN links. Below the header is a banner with a network graph background and the text "Managed Services to Simplify Cloud Access for Computer Science Research and Education". The main content area is titled "FEATURES" and includes three sections: "User Portal" (showing a person at a desk), "Financial Operations" (showing a laptop displaying financial charts), and "Education & Training" (showing students in a classroom). Each section has a brief description below it.

CloudBank

TRAINING ABOUT FAQ HELP LOG IN

Managed Services to Simplify Cloud Access for Computer Science Research and Education

## FEATURES

For an overview of CloudBank and the key features of portal, please see [our presentation to Campus Champions](#).  
For an introduction to using public clouds, please see our [Cloud 101 videos](#).

**User Portal**  
Researchers can manage their cloud resources and monitor their usage through the CloudBank user portal.

**Financial Operations**  
CloudBank simplifies accounting processes and helps optimize resource usage for researchers.

**Education & Training**  
CloudBank offers classroom tools, training workshops and videos, curated training materials, and individual support to help researchers get started.



Google Cloud



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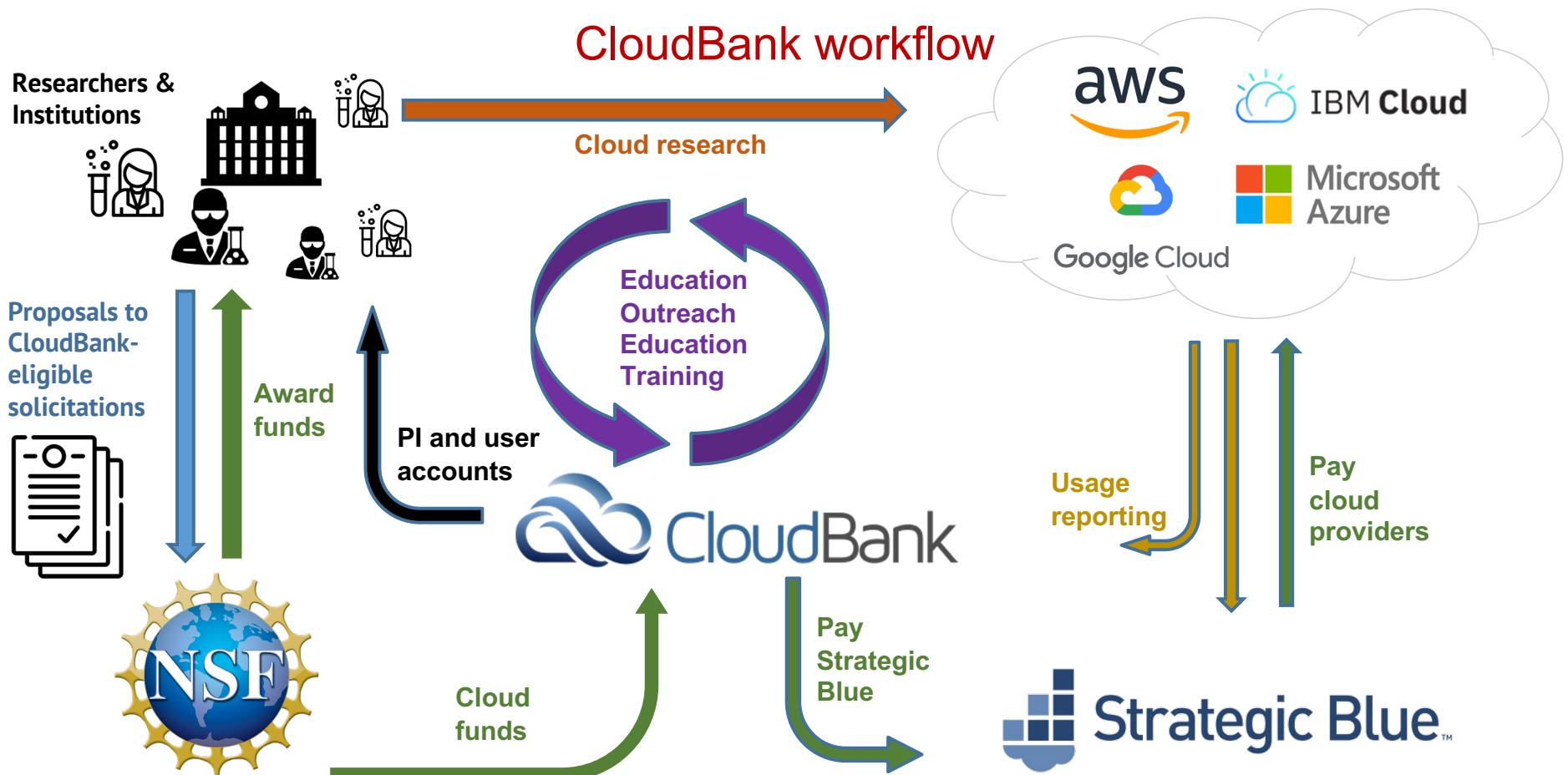


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# CloudBank is focused on specific NSF solicitations

- **IMPORTANT SCOPE:** Only specific NSF solicitations are eligible for cloud resources through CloudBank. The solicitation will state eligibility explicitly. There have been 10 such solicitations so far with 4 active solicitations:
  - NSF 21-583: Geoinformatics (GI): August 16, 2021
  - NSF 21-591: Computer and Information Science and Engineering (CISE) Research Initiation Initiative (CRII): September 20, 2021
  - N
  - N
- Without CloudBank, institutions would add cloud funding to their budget and many would pay indirect costs.
- Use a
- Pls req
- does not pass through the awardee institution. The total of your formal budget request and the cloud request must not exceed the total allowable request for the solicitation.
- Cloud resources are free of indirect costs. I.e., are treated like equipment





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# Getting access to CloudBank

## NSF Proposal

A subset of NSF solicitations are “CloudBank-eligible”. Cloud costs are estimated in a 2-page supplementary document to proposal.

## Discretionary awards

Modest awards are available to researchers to “kick the tires” or for educators to run classes in the cloud.

## Enterprise

For institutes that would like to adopt some or all of CloudBank’s model



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# CloudBank User Portal Demo

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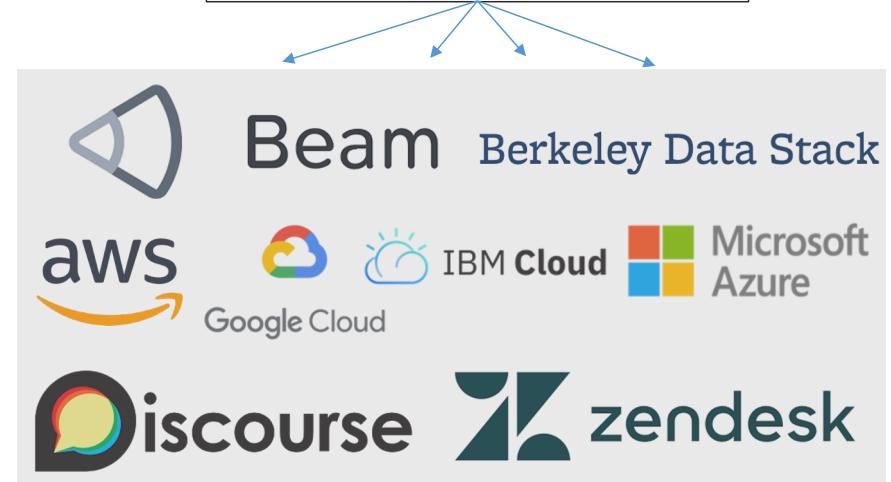
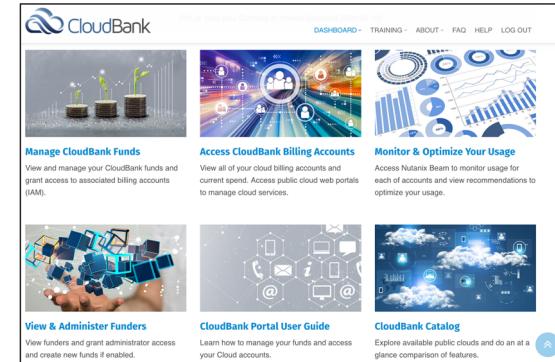
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# CloudBank Benefits for PIs

- **Beginning of your award**
  - New CloudBank “fund” with access to each cloud that you requested. You can request more clouds at anytime.
  - Login to CloudBank and associated portals using your institute credentials.
  - Tools to enable students, staff, or colleagues to use your funds.
  - Onboarding meeting.
  - Connection to cloud vendors if you need specific technical assistance.
- **During your award**
  - Automated balance alerts, summary spend data, and detailed spend data (via Nutanix Beam).
  - CloudBank training resources and pointers to cloud vendor content.
  - Help desk support and/or participation in community forum.
- **Near end of your award**
  - Facilitated offboarding process – e.g., data migration or storage purchased beyond award.



## Early experiences

- Early testing May - August 2020, went into production in August 2020
- 3 NSF CloudBank awards with ~10 more coming soon
- 5 discretionary awards for performance benchmarking and tool integration

Support cloud bursting with APIs to prevent overspend.



First CloudBank-eligible NSF solicitation was 19-564: Smart and Connected Communities and first CloudBank award went to University of Maryland to track and improve Baltimore public transit service.



# CloudBank supports running classes in the cloud



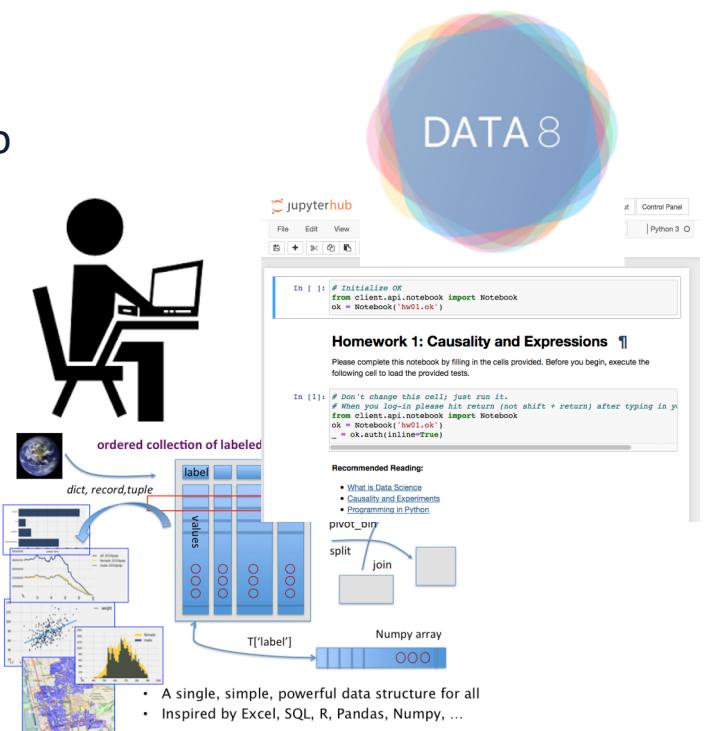
Clovis  
Community  
College

Pilots for future semesters

- City College of San Francisco
- Clovis Community College

Part of 2i2c consortium which  
has several other pilots

# MILLS



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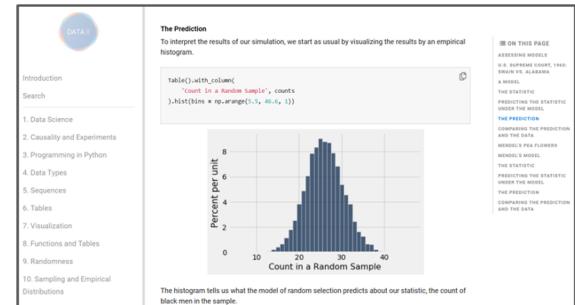
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# Berkeley Data Stack: Education Using the cloud

- Scalable teaching both on campus and remote
- Popular Data Science curriculum -- fastest growing major at UC Berkeley
- Modern education: online textbooks, videos, interactive assignments, etc.



# Open infrastructure for introductory data science

Provide a shared computing environment

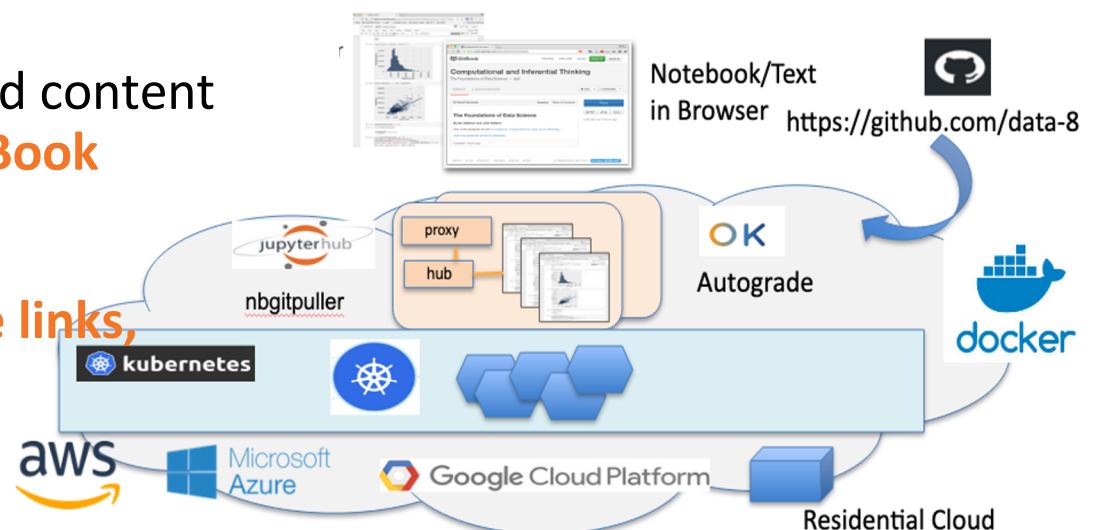
**JupyterHub, BinderHub**

Guide learners with structured content

**Jupyter Notebooks, Jupyter Book**

Tools for instruction

**Online textbooks, interactive links,  
autograders, etc.**



# Future Work

- “Train the trainers” workshops
- Cloud credit support
- Tool APIs
- More NSF tracking capabilities
- Institute capabilities
- Additional training materials and workshops
- Integrating more cloud resources
- Cost monitoring improvements
- ...and more

## Thank you!

CloudBank team members at UCSD, UW, UCB, and Strategic Blue: Jon Bryant, David Culler, Frank Contrepos, Brian DeMuelle, Declan Fleming, Paul Hoover, Kate Kaya, Nick Marangella, Stephen Old, Sanjay Padhi, James Percy, Jessica Respicio, James Smith, Shawn Strande, Mary Thomas, Eric Van Dusen, Nicole Wolter, and Choonhan Youn.

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Amazon, Google, IBM, and Microsoft

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