MS-CC: Bridging the Digital Divide

CI COMPASS Webinar
October 18, 2023
Hello!
## Quick Facts

<table>
<thead>
<tr>
<th>Designation</th>
<th># of U.S. Institutions</th>
<th>% of all U.S. Institutions</th>
<th>% of STEM bachelor degrees attained</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBCUs - Historically Black Universities and Colleges</td>
<td>99</td>
<td>1.67%</td>
<td>25%</td>
</tr>
<tr>
<td>TCUs - Tribal Colleges and Universities</td>
<td>35</td>
<td>0.59%</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

*SOURCE: National Center for Education Statistics. (2022) Table 105.50. Number of educational institutions, by level and control of institution: 2010–11 through 2020–21 [Data table].*
TCU Quick Facts

• Today there are 35 accredited TCUs.

• TCUs offer certificate programs and associate degrees, with 19 TCUs offering bachelor’s degree programs, and 7 TCUs offering master’s degree programs.

Source: American Indian College Fund
HBCU Quick Facts

• There are 99 HBCUs located in 19 states, the District of Columbia, and the U.S. Virgin Islands.

• Approximately 89% of all HBCUs are in the southern region of the United States, although they can be found in Delaware, Illinois, Maryland, New York, Ohio, Pennsylvania, and West Virginia.

• Almost 18% of Black STEM bachelor’s degrees are awarded from HBCUs and a third of all Black students who have gotten a doctorate degree earned their bachelor’s from an HBCU, according to the National Science Foundation.
More Context

• Today there are over 700 Minority Serving Institutions (MSIs) that enroll nearly **30% of all undergraduates** in the U.S. higher education system.

• MSIs are classified based on either legislation or the percentage of minority student enrollment, and include:
  • Hispanic-Serving Institutions (HSIs)
  • Alaska Native-Serving and Native Hawaiian-Serving Institutions (ANNHIs)
  • Asian American and Native American Pacific Islander-Serving Institutions (AANAPISIs)
  • Predominantly Black Institutions (PBIs)
  • Native American-Serving Nontribal Institutions (NASNTIs)

• **Historically Black Universities and Colleges** (HBCUs) and **Tribal Colleges and Universities** (TCUs) are distinct among MSI designations due to their historical legacies and the injustices that led to their establishment.
  • HBCUs were created in the early 19th century to provide educational opportunities for African Americans who were denied access to existing higher education institutions. Even after specific legislation was passed, Black students still faced barriers to higher education.
  • TCUs are chartered by tribal governments, have a strong emphasis on tribal identity, and serve their respective communities as part of the mission of tribal self-determination.
Reframing our Perspective: Centering HBCU and TCU Voices to Reimagine a Stronger R&E Community

- Sandra Boham, President of Salish Kootenai College
- Deshon Miguel, Director of Information Technology at Tohono O’odham Community College
- Joseph Whittaker, Vice President for Research and Economic Development/Associate Provost at Jackson State University
- Urban Wiggins, Vice Provost for Decision Science and Visualization at the University of Maryland Eastern Shore
A group of Chief Information Officers (CIOs) from Historically Black Colleges and Universities (HBCUs) approached Internet2 about a collaboration of HBCUs, Tribal Colleges and Universities (TCUs), and Hispanic Serving Institutions (HSIs) to reduce the gap between their campus networks and the global R&E ecosystem. A working group was formed, including 15 campus representatives, Internet2 staff, and interested MSI advocates.

We started listening – and working together.
THE VISION

MS-CC envisions a transformational partnership to promote advanced cyberinfrastructure (CI) capabilities on HBCU, HSI, TCU, and MSI campuses. We are advancing connections across campuses around data, research computing, teaching, curriculum development, professional development, and capacity-building.

We will learn and grow as a consortium, lifting up all participating institutions by advancing cyberinfrastructure for research and education across diverse fields, disciplines, and communities in ways that reflect the unique voices and interests of our communities.

We will engage as full contributors to the global R&E community.
MS-CC Guided by Consortium Leadership Board (CLB)

- Dr. Richard Aló, Florida A&M University
- Al Anderson, Salish Kootenai College
- Joey Brenn, Claflin University
- Dr. Ming-Hsing Chiu, Dillard University
- Bobby Clark, Clemson University
- Dr. Deborah Dent, Jackson State University
- Tom Jackson, North Carolina A&T State University
- Dr. Urban Wiggins, University of Maryland Eastern Shore
- Jim Bottum, Emeritus College, Clemson University
- Leah Kraus (Retired), North Carolina Central University
- Ana Hunsinger, MS-CC PI, Internet2
CI Center of Excellence Demonstration Pilot
Award # OAC-2137123

21st Century Research-Cyberinfrastructure for MSIs through the Minority Serving - Cyberinfrastructure Consortium: A phased approach to engage the Missing Millions
Award # OAC-2234326

Collaboratory in Climate Science
Supplement to Award # OAC-2234326
NSF CI Center of Excellence Demonstration Pilot

Minority Serving Cyberinfrastructure Consortium (MS-CC)
Award # OAC-2137123
Start date: 10/1/2021  Projected end date: 9/30/2024

Objectives

• Create a connective and collaborative organization that serves as a centralized hub for HBCUs, TCUs, and other MSIs to utilize for CI expertise, experience-sharing, and advocacy.

• Increase awareness, availability, and financial support for CI-relevant professional development for faculty, staff, and students at HBCUs, TCUs, and other MSIs.

• Enhance communication among researchers, university leadership, and CI professionals.

• Increase access to shared CI resources at MS-CC organizations.

Scientific and Broader Impacts

• Advance understanding of the benefits for shared CI across a distributed community of minority-serving colleges and universities in a mix of urban, suburban, and rural settings

• Advance CI capabilities at these and other minority serving campuses

• Increase the availability of workforce development opportunities for researchers, professional staff, and students at HBCUs, TCUs, and other MSIs

• Increase diversity in the STEM talent pool and workforce

• Advance understanding around the importance of multi-stakeholder consortia supporting CI
5 Workshops
- North Carolina A&T State University
  - 9 HBCUs, 2 TCUs; 34 total attendees, 22 organizations
- Salish Kootenai College
  - 8 TCUs; 46 total attendees, 14 organizations
- Jackson State University
  - 12 HBCUs; 46 total attendees, 18 organizations
- Claflin University
  - 6 HBCUs; 38 total attendees, 16 organizations
- University of Maryland Eastern Shore
  - 2 HBCUs; 24 total attendees, 7 organizations

Inaugural Annual Meeting and Student Hackathon
- Annual Meeting
  - 25 HBCUs (23%), 3 TCUs (8%); 114 total attendees; 58 organizations
- Student Hackathon
  - 5 HBCUs, 1 TCU; 27 total attendees

Funded Travel, Attendance at Community Events
- 8 scholarship recipients attended TechEX 2022
- 36 attendees (4 HBCUs, 2 TCUs) attended Hackathon and Annual Meeting
- 1 CLB ACM membership to attend PEARC 2023

Exponential Community Growth
- 2021: 107 total participants; 59 organizations
- 2023 YTD: 305 total participants; 139 organizations

Monthly CI Community of Practice (CI CoP)
- Started Feb. 2023, averages more than 20 participants/month

MS-CC Community Survey for Input into Activities
- 2 Stakeholder Pulse Surveys (Waymark Analytics)
- CI Facilitation Services

Supported MS-CC’s Initial Governance and Work Toward It
- Updated charter released to community in June 2023

Access workshop and events presentations/materials bit.ly/MSCCpresentations

22 HBCUs (20%*) attended a workshop
8 TCUs (22%**) attended a workshop

2021-2023 YTD participants growth: 185%
2021-2023 YTD CAGR 117%
2021-2023 YTD organizational growth: 136%
2021-2023 YTD CAGR 33%

*20% of all HBCUs; **22% of all TCUs
NEW MS-CC Website
Launched October 2023

www.ms-cc.org

Minority Serving – Cyberinfrastructure Consortium

Accomplishing More Together

By working together and in community, we strive to strengthen the student, faculty, and staff experience at HBCUs and TCUs by focusing on sustainable campus-level IT capabilities for data-intensive education and research programs.

Strength in Numbers. Power of Community.

55
Historically Black universities and colleges (HBCUs)

19
Hispanic-serving institutions (HSIs)

10
Tribal colleges and universities (TCUs)

54
Affiliate organizations

www.ms-cc.org

Join
Issues include:

- The evaluation criteria of federal grant programs that prevent resource-strained HBCUs and TCUs from being competitive among larger, well-funded institutions.

- MS-CC campuses not only need to advance their CI and research infrastructure; they also need to build expertise to deploy and use CI tools and implementations.

- Competing priorities in supporting the campus infrastructure and limited resources and staffing needed to implement, maintain, troubleshoot, and just keep the lights on to support the campus operating.

- Assumptions that a campus has done work towards identifying STEM research and education drivers that require the use of computational and other CI resources provided by these efforts and where the training becomes necessary.
Objective

- Significantly *increase and accelerate cyberinfrastructure-centric research capacity* at MS-CC campuses through a set of new approaches from which we can then learn and potentially frame a repeatable, successful model for cyberinfrastructure implementations on the campuses of minority-serving institutions.

Approach

- Initial allocation of *at least five (5) Proof of Concept Grant (PoCG) Awards* to select MS-CC institutions that allows each to perform campus specific CI assessments that drive an overall CI strategic plan and a roadmap to pioneer new capabilities that advance CI-centric research, and empower scientific advancements.
- Establishing *teams of expert CI Professionals* that will provide support to the PoCGs through consultation, implementation of expanded CI capabilities, and leading efforts to ensure these institutions are participating and collaborating with the broader CI ecosystem.
- *MS-CC as a more robust effort* so that it can be able to support future PoCGs and to support a more directed approach to ensure these institutions are participating and collaborating with the broader CI ecosystem.
NSF Award
Minority Serving Cyberinfrastructure Consortium (MS-CC)
Award # OAC-2234326

21st Century Research-Cyberinfrastructure for MSIs through the Minority Serving - Cyberinfrastructure Consortium (MS-CC): A phased approach to engage the Missing Millions

Scientific and Broader Impacts

- **Workforce**: Increasing the number of qualified students entering the STEM workforce from HBCUs and broadening the CI knowledge and capabilities of faculty, staff, and students at HBCUs
- **Campus Infrastructure**: Supporting the resources necessary to develop the workforce on HBCU and TCU campuses, leading CI advancements on campuses. Allowing institutions to become a training ground that develops professionals who are able to implement and operate their campus CI.
- **Research**: Advancing CI capabilities that allow for new, and more robust community-focused research that has historically not been able to advance at HBCUs due to limited resources
- **Collaboration**: Using Tiger Teams as a shared service among organizations to broaden collaborations, discussions, and communities of practice within the HBCU and TCU community and ensuring perspectives are considered throughout the entire research and education community

Intellectual Merit

- Advance understanding of how a consortia of shared resources and expertise can allocate these resources to historically underserved institutions for targeted impact in their communities, and toward diversifying the STEM workforce
- Allow new collaborations to occur between HBCUs, TCUs and already established research communities, allowing for new ideas to be incorporated into practices that may not have previously considered the needs of minority-serving communities
- Enable Federal agencies to gain insight into STEM fields and programs essential to minority-serving communities
- Pioneer new capabilities that better meet the needs, advance CI-centric research, and empower scientific advancements on HBCU, TCU, and other MSI campuses
NSF Award # 2234326 Ongoing Activities

All Proof-of-Concept Grant (PoCG) Activities
- Stakeholder Alignment toward formalized CI governance
- PoCG-funded CI Facilitator or CI Coordinator implementation

Claflin University
- R&E Facilitation informing HPC investment
- eduroam implementation

Jackson State University
- R&E Facilitation informing HPC investment
- Network Enhancement, with eduroam implementation

North Carolina A&T State University
- R&E Facilitation informing cybersecurity compliance support
- CI self-assessment and strategic planning toward R1 goal

Salish Kootenai College
- R&E Facilitation informing conference participation, CI governance
- Virtual Lab and Network development, with eduroam implementation

Nashville HBCUs
- Chartered Nashville HBCU CI Collaborative
- Coordinated network development and campus CI Plans
Objective

• Develop a **Collaboratory in Climate Science** that pairs cyberinfrastructure expertise and capabilities with ongoing climate science research initiatives, strengthening the pipeline of faculty, staff, and students from HBCUs and TCUs with expertise in cyberinfrastructure-enabled climate science research and learning.

• Build **community-driven collaboration around climate science** across the MS-CC and key partners to develop long term education and research community efforts.

Approach

• The MS-CC Collaboratory in Climate Science will be a **campus-based effort** that focuses on local community or regional climate issues and concerns as well as workforce development.

• MS-CC will **partner with three anchor institutions**, including a climate-focused TCU and two HBCU National Oceanic and Atmospheric Administration (NOAA) Cooperative Science Centers (CSCs), to **develop campus-based events, collaboration opportunities, and summer internships** for participants from multiple HBCUs and TCUs.

• MS-CC will use its engagements to carry out **Communities of Practice to support informal collaboration in climate science and CI to identify shareable solutions in CI**, while serving as an opportunity for the broader community to communicate and share information with the MS-CC.
Broader Impacts

• Key in advancing the knowledge of regional challenges and concerns affecting climate change and enabling more opportunities for HBCU and TCU faculty, staff, and students to become prominent contributors to addressing these challenges, resulting in healthy, thriving communities and the expansion of the STEM workforce from HBCUs and TCUs.

• Knowledge and training from NOAA Cooperative Science Centers to non-NOAA funded institutions will be enhanced, transferred, and encouraged, creating opportunities for developing additional partnerships among CI-focused and climate science-focused organizations and initiatives, enhancing HBCU and TCU engagement with these organizations.

Intellectual Merit

• Continue to build on the MS-CC’s objective of leveraging CI for advancing research and education at underserved institutions.

• Realize the benefits and needs for shared resources across minority-serving institutions.

• Increase CI-enabled climate science research at HBCUs and TCUs, and allowing for the progression of activities that support knowledge and practices for being adaptive and resilient to climate change.

• Enhance current effective practices for convening, retaining students, and encouraging their persistence to graduation.

• Provide insight into necessary curriculum enhancements and student experiences that will develop CI professionals and provide career pathways for students from HBCUs, TCUs and the greater community of minority-serving institutions.
Thank you!

www.ms-cc.org

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