The Computing Community Consortium: Catalyzing and Enabling Computing Research

Susan L. Graham
Chair

Gregory D. Hager
Vice-Chair

Beth Mynatt
Incoming Vice-Chair

Ann Drobnis
Director

Andrew Bernat
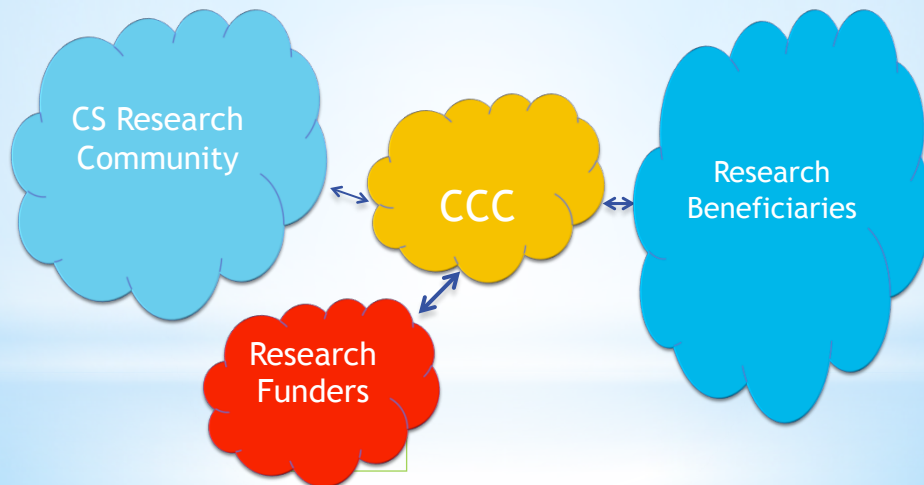CRA Executive Director

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An Overview of the Computing Community Consortium

- Established in 2006 as a standing committee of the Computing Research Association
- Funded by NSF under a Cooperative Agreement
    - **2012 renewal is the subject of this review**
- Facilitates the development of a bold, multi-themed vision for computing research – and communicates this vision to stakeholders
- Led by a broad-based Council
- Staffed by CRA

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Why Have a CCC?

CS Research Community

CCC

Research Beneficiaries

Research Funders

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Our Mission

The **mission** of Computing Research Association's Computing Community Consortium (CCC) is to:
catalyze the computing research community and
enable the pursuit of innovative, high-impact research.

CCC conducts activities that
strengthen the research community,
articulate compelling **research visions**, and
align those visions with pressing **national and global challenges**.

CCC **communicates** the importance of those visions to **policymakers**, government and **industry stakeholders**, the **public**, and the **research community** itself.

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A Multitude of Activities

- **Community-initiated visioning:**
  - Workshops to discuss "out-of-the-box" ideas
  - Blue Sky Ideas tracks at conferences

- **Outreach to White House, funding agencies:**
  - Outputs of visioning activities
  - Short reports to inform policy makers
  - Task Forces – Health IT, Sustainability IT, Data Analytics
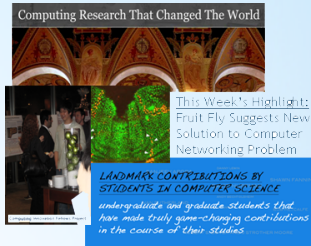
- **Communicating CS Research:**
  - "The Impact of NITRD" symposium
  - Research "Highlight of the Week"
  - CCC Blog [http://cccblog.org/]
  - Computing Research in Action Video Series

- **Nurturing the next generation of leaders:**
  - Computing Innovation Fellows Project
  - "Landmark Contributions by Students"
  - Leadership in Science Policy Institute

What Distinguishes CCC?

- **Proactive, rapid response**
  - Identify, plan, and execute in a matter of weeks to months

- **Community-based**
  - Find and foster ideas from germination to fruition and beyond

- **Leadership incubator**
  - Everyone is expected to do something!

Renewal Proposal Goals

1. Establish the CCC as a widely accepted catalyst and voice for the computing research community.
2. Bring the computing research community together to envision our future research needs and thrusts.
3. Communicate these challenges, needs and thrusts to the broader national community.
4. Create within the computing research community more audacious thinking.
5. See the ideas developed in the second and fourth points above turned into funded research programs.
6. Increase the excitement within computing research and use that excitement to attract students.
7. Inculcate values of leadership and service.

Renewal Review Recommendations

1. Sustainability
   a. Investigate the viability of broader funding
   b. Leadership succession – move from a start-up to a sustained organization
2. Broadening Reach
   a. Outreach to additional federal agencies and to Industry
   b. Outreach to broad computing community
   c. Outreach along with CISE to university leadership
3. Recognize tension between expanded breadth and impact.

Outline

- New Organizational Structure
- Catalyzing: Ideas to Action
- Enhanced Community Building
- Communicating
- Connecting
- Impact

New Organizational Structure

New CCC Organizational Structure

Chair, Vice-chair
- 2 year non-staggered terms
- Vice-chair is presumptive chair

Executive Committee
- Chair, Vice-chair, Director
- 3 at large drawn from Council for 1-year terms
- CRA Executive Director

Council
- 20 members
- 3 year terms, at most 2 consecutive terms

Director, Program associate
- Full-time paid positions

What Does Executive Committee Do?

- Each member has a major responsibility within the organization
- Oversees the work of subcommittees and working groups
- Guides the planning of new activities
- Oversees the execution of the Strategic Plan

- Meets weekly by teleconference
- Meets biweekly with NSF by teleconference

What Do Council Members Do?

- Shepherd visioning activities
- Participate in topical subcommittees
  - Examples: Health IT, Sustainability, Robotics, Big Data
- Develop new activities
  - Examples: CIFellows, LISPI, Post-doc Best Practices
- Engage with related groups (CISE AC, CSTB, ACM …)
- Other requests as needed
  - Example: short turnaround white papers

- Bi-weekly teleconferences
- Three face-to-face meetings each year

New Succession Plan (and Bylaws)

- Biannual Chair/Vice-chair renewal
  - Normally, Vice-chair becomes new Chair
  - Outgoing Chair and Vice-chair and Director select new Vice-chair, with broad confidential consultation

- Annual Executive Committee renewal
  - Chair, Vice-chair, and Director select at-large members for 1-year terms
  - Leadership-grooming opportunity

More on Succession Plan

- Annual Council renewal
  - 3-year term can be renewed once (unless become Vice-chair/Chair)
  - Potential for organizational leadership important
  - Diversity of field, institution, professional age, gender, under-represented groups all important
  - Commitment important

  - Open search – nominations invited
  - Search committee is chaired by EC member
  - Coordination with EC

Changes to the CCC Council

- Terms ending 6/2016
  - Randy Bryant, CMU **– 1 year leave**
  - Limor Fix, Intel
  - Mark Hill, U. Wisconsin, Madison
  - Tal Rabin, IBM Research
  - Daniela Rus, MIT
  - Ross Whitaker, Univ. Utah

- Terms ending 6/2015
  - Liz Bradley, Univ. Colorado
  - Susan Davidson, Univ. Penn.
  - Joe Evans, Univ. Kansas
  - Ran Libeskind-Hadas, Harvey Mudd
  - Elizabeth Mynatt, GA Tech
  - Shashi Shekhar, Univ. Minnesota

- Terms ending 6/2014
  - Deborah Crawford, Drexel
  - Anita Jones, Univ. Virginia
  - Fred Schneider, Cornell
  - Josep Torrellas, Univ. Illinois

  rotate off
  - Bob Sproull, Sun Labs Oracle (ret.**)** **– term extended one year**

- Terms ending 6/2017
  - Jennifer Rexford (Princeton)
  - Klara Nahrstedt (UIUC),
  - Vasant Honavar (Penn State)
  - Debra Richardson (UC Irvine)
  - Lorenzo Alvisi (UT Austin),
  - Ben Zorn (Microsoft Research)

  new members

Changes to the CCC Executive Committee

2013-14 to 2014-15
- Susan Graham, UC Berkeley (Chair) – becomes Past Chair
- Greg Hager, Johns Hopkins (Vice Chair) – becomes Chair
- Ed Lazowska, U. Washington (Past Chair) – rotates off
- Elizabeth Mynatt, Georgia Tech – becomes Vice Chair
- Fred Schneider, Cornell – rotates off
- Sue Davidson, Univ. Pennsylvania – rotates off
- Ann Drobnis, Director
- Andy Bernat, CRA Executive Director

- Liz Bradley
- Mark Hill – rotate on
- Bob Sproull

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CRA Staff

- CCC Director: Ann Drobnis
  - 100% CCC, responsible for day-to-day management of the Organization
- Program Associate: Helen Vasaly
  - 80% CCC, responsible for logistical support and back-up to Director
- CRA Executive Director: Andy Bernat
  - 40% CCC, responsible for general oversight
- Other CRA Staff:
  - Peter Harsha, Director of Government Affairs
  - Shar Steed, Communications Specialist
  - Jane Stout / CERP, Evaluation

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Catalyzing: Ideas to Action

Visioning Processes

- Periodic RFP for Community Initiated Activities
- Historically 3-7 workshops per year
- Top-down (agency initiated)
- Bottom-up (open call)
- Sideways (council initiated, joint with other agencies, ...)

Robotics   Spatial Computing   Online Education   Privacy R&D   Uncertainty in Computation

Visioning Activities

2012

- From GPS and Virtual Globes to Spatial Computing – 2020
- Computing and Healthcare: New Opportunities and Directions

2013

- Convergence of Software Assurance Methodologies and Trustworthy Semiconductor Design and Manufacture (SA+TS)
- Multidisciplinary Research for Online Education
- Privacy R&D Workshop (with ITIF)
- Extreme Scale Design Automation 2 (with ACM)
- Visions of Theory of Computing (with Simons Institute)
- Robotics, Automation, and Computer Science (with NSF, OSTP)

2014

- Extreme Scale Design Automation 3 (with ACM)
- Computing Visions 2025: Interacting with the Computers All Around Us (with CISE)
- Computing Visions 2025: The New Making Renaissance: Programmable Matter and Things (with CISE)

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Visioning Activities: Upcoming

- Human Computation (from open solicitation)
- Uncertainty (from open solicitation)
- Aging in Place (with NIH)
- Computing Visions 2025: Computing and the Smart World (with NSF CISE AC)
- BRAIN (with NSF CISE)
- 2 more under development from Community

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Computing Visions 2025

- Joint Venture of NSF CISE Advisory Committee and CCC
- Articulate future trends and opportunities in computing research. Envision evolution and growth over the next 10 to 15 years.
- 3 Initial Workshops:
  - **Interacting with the Computers All Around Us**
    - Look at how technology could change how computers interface with people and the world around them.
  - **The New Making Renaissance: Programmable Matter & Things**
    - Explore the way items are designed, programmed, manufactured, and delivered/deployed.
  - **Computing and the Smart World (forthcoming)**
    - Look at the massive amounts of data and advanced analytical techniques to "make the world smart"
- Panel session at Snowbird 2014

Blue Sky Ideas Conference Tracks

- BuildSys 2012
- Computational Sustainability Track @ AAAI 2013
- Computational Sustainability Award @ CHI 2013
- Robotics: Science and Systems 2013
- Conference on Innovation Data Systems Research (CIDR-2013)
- Autonomous Agents and MultiAgent Systems (AAMAS-2014)
- Upcoming:
  - Foundations of Software Engineering 2014
  - Association for the Advancement of Artificial Intelligence 2015

Community Building

Leadership in Science Policy Institute

To educate a cadre of computing researchers on how science policy in the U.S. is formulated and how our government works

November, 2011
- 34 attendees;
- 7 women
- 19 received financial aid
- 24 institutions represented
- 23 participants from public institutions; 7 from private; 4 from industry;

Henry Kelly, DoE

April, 2013
- 53 attendees;
- 12 women
- 6 received financial aid
- 47 institutions represented
- 40 participants from public institutions; 12 from private; 1 from industry

Milt Corn, NIH

Attendees

CI Fellows

- Computing Innovation Fellows, to keep PhD graduates in the research pipeline during the economic downturn
  - 2009: 60 Fellows, 50 have permanent research positions (33 academic, 16 industry, 1 government)
  - 2010: 47 Fellows, all have permanent positions in research (27 academic, 20 industry)
  - 2011: 20 Fellows, 15 have permanent research positions (11 academic, 3 industry, 1 government)
- CERP's CI Fellows Evaluation Report – April 2014
- CI Fellows Workshop – May 22-23, 2014

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CI Fellows Evaluation – Key Findings

Compared to Non-fellow Postdocs, CI Fellows

- Experienced greater independence during their postdoc
- Were more satisfied with how their postdoc prepared them for balancing work-life responsibilities
- Received higher postdoc salaries that made it easier to live and relocate
- Had higher salaries at the time of the survey

Postdoc programs in general:

- Were rated positively in terms of support, opportunities, and skills preparation
- Could be improved to reduce negative impact of relocating
- Could be more accommodating of personal and family responsibilities

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The Changing Complexion of Computing

Employment of New Ph.D.s in Tenure-Track Faculty, Industry, and Postdoc Positions
Source: CRA Taulbee Survey

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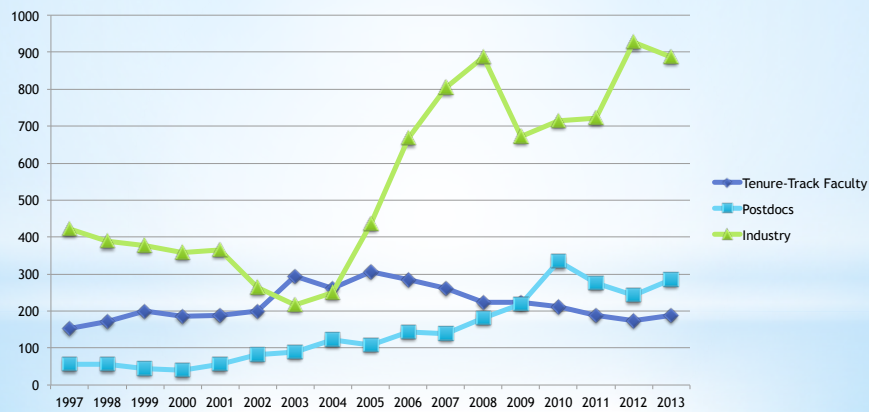
Computing Innovation Fellows Project -> Postdoc Best Practices

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Postdoc Best Practices

- 3 Projects began April 2014 for 3 years
  - **ASCENT: Advancing computer Science Careers through Enhanced Networking and Training**
    - Columbia, Cornell, CUNY, NYU, Teacher's College

  - **Taking Collective Responsibility for the Postdoc Experience**
    - University of Washington

  - **A Foundational Model for Postdoctoral Programs in Computer Science & Engineering at Large Universities**
    - Arizona State University, with University of Arizona and Northern Arizona University

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Communicating

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Communicating: Web Site

http://cra.org/ccc

Communicating: CCC Blog

Top 10 Posts in Past Year

- MIT Technology Review's 10 Breakthrough Technologies of 2013
- NIH Big Data to Knowledge (BD2K) Initiative
- Big Data and the 2012 Summer Olympics
- What Computer Science can Teach Us About Robotics
- FOCUS identifies "The Best Jobs in America"
- 2013 Microsoft Research Faculty Summit – OFF THE CHARTS
- DARPA Announces two new programs as part of White House BRAIN Initiative
- Computer Science for Non-Majors
- 21st Century Computer Architecture
- "The Algorithm That Runs the World"

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Communicating: Computing Research in Action

- Ubiquitous Computing Lab at the University of Washington
- SmartGeo at the Colorado School of Mines
- Vehicle-to-Grid at the University of Delaware
- In production: Integrating Robots with Tactical SWAT Teams at Mississippi State University

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Connecting

Connecting: Collaborative Workshops

- NSF beyond CISE
  - BIO (BRAIN)
  - ENG (Manufacturing, Robotics)
  - EHR (Online Education)
  - GEO (Spatial Computing)
  - MPS (Big Data)
  - SBE (Health)

- HealthIT events (NIH, CMS, AHRQ, VA, FDA, NSF)
- Aging in Place (NIH, CMS, AHRQ, VA, FDA, NSF)

- Many agency participants in CCC-sponsored workshops

Connecting: Other Interactions

- Overlapping memberships
  - Sproull (CSTB), Rexford, Davidson, Horwitz (CISE AC), Graham (ASCAC, PCAST), Jones (NAE Council), Lazowska (many), Bryant (term at OSTP), CCC Chair (CRA Board), Davidson, Schneider (CRA Board)
- Many meetings and discussions
  - OSTP
  - Dept. Ed, offices within DoE
  - Bourne – new NIH AD for Data Science
- Participation in CSTB studies (Mynatt, Lazowska, Bryant, Sproull, etc.)
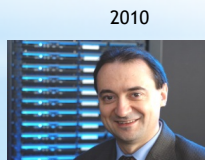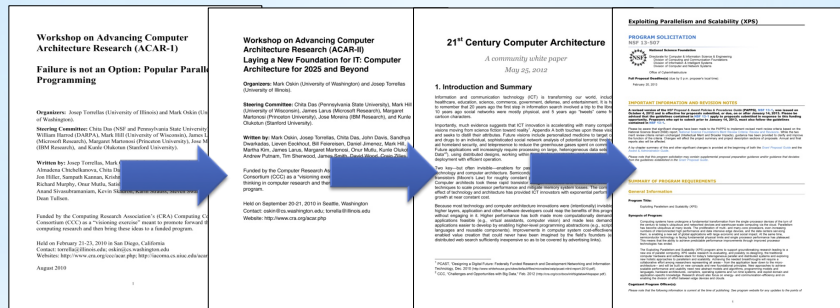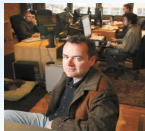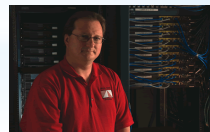- Shared visioning – ISAT
- Many external talks about CCC

How Do We Measure Success?

- Impact: Core programs influenced by CCC activities

2010　　　　2010　　　　2012　　　　2013

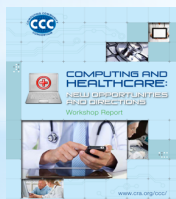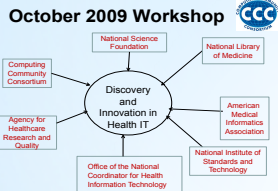Josep Torrellas, UIUC　　Mark Oskin, Washington　　Mark Hill, Wisconsin

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How Do We Measure Success?

- Impact Interdisciplinary programs influenced by CCC activities
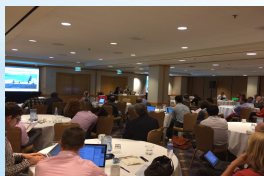
October 2009 Workshop

October 2012 Workshop
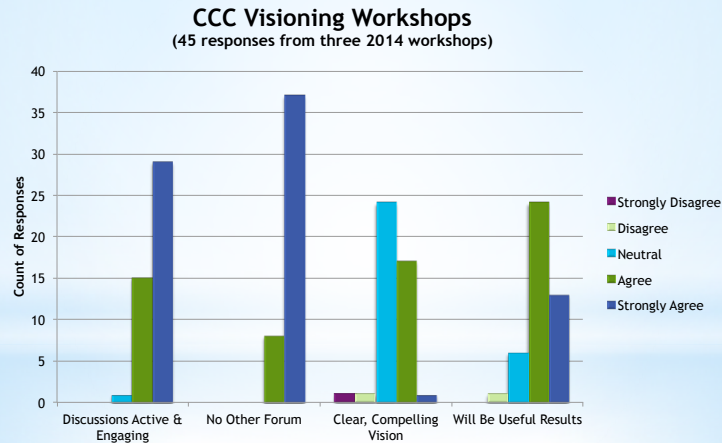

How Do We Measure Success?

- Quantitative
  - 478 Participants in CCC Visioning activities
  - 349 Participants in co-sponsored activities
  - 154 people have submitted papers to Blue Sky Ideas Conference Tracks
  - 103,999 unique visitors to the CCC Blog

How Do We Measure Success?

■Quality: responses from 2014 workshop evaluations

CCC Visioning Workshops
(45 responses from three 2014 workshops)

Chart legend: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree. Y-axis: Count of Responses (0–40). X-axis categories: Discussions Active & Engaging, No Other Forum, Clear, Compelling Vision, Will Be Useful Results.

How Do We Measure Success?

■ Awareness: requests for activities, support, talks; workshop proposals and participation; blog readership and re-posting.

■ Agility: quantity and rapidity of responses to government requests for input, new mechanisms that we create in response to a CSE community need.

■ Breadth and diversity of participation in CCC activities.

The Impact of CCC in 2025

- The quality and vigor of our national research program
  - Computer science core has a clear identity and vibrancy
  - Computer science research is broad, inclusive, collaborative

- Advancement of CSE in science and national priorities
  - Any major S&T board has substantial CSE representation
  - Funding agencies have grown and expanded CSE research

- Leadership development
  - CCC membership is a training ground
  - CCC activities continue to engage and excite the community and stakeholders

Summary

- CCC has executed on its plans to create a long-term sustainable organization

- CCC has become known as a resource for ideas, people, and action on a broad range of computing issues

- CCC will continue to engage and catalyze the CSE research community around new ideas and important issues

- CCC will continue to grow human resources by emphasizing leadership, involvement, and action

Responses to Questions

- Agenda setting, CCC vs. CISE (Susan)
- Activities, Goals (Greg)
- What do you do after a workshop (Beth)
- Industry (Beth)
- Budget (Andy)
- CCC 2025 (Greg)

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	Visioning	Connecting	Leadership	Communication
Establish the CCC as a widely accepted catalyst and voice for the computing research community.	Workshops and Blue Sky	Workshops	LiSPI, Postdocs Council mem	CCC Blog, Computing Research in Action
Bring the computing research community together to envision our future research needs and thrusts.	Workshops and Blue Sky	Workshops		
Communicate these challenges, needs and thrusts to the broader national community.		Position papers	Council, visioning leadership	CCC Blog
Create within the computing research community more audacious thinking.	Workshops and Blue Sky	Workshops		
See the ideas developed in the second and fourth points above turned into funded research programs.	Workshops	Agency engagement		
Increase the excitement within computing research and use that excitement to attract students.		CI Fellows		CCC Blog, Computing Research in Action
Inculcate values of leadership and service.		Committee memberships	LiSPI	

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Workshop Best Practices

- **Pre** workshop: Steering committee; Shared Goals and Outcomes; Snowball recruitment

- **During** workshop: Mixed methods (plenary, panels, breakout groups, facilitators); Find ways to capture materials

- **Post** workshop: White papers; Presentations and briefings

Growing Capacity - 2025

- Until now -- from startup to sustainable

- Over the next five years
  - CCC alumni growth
  - CCC event participation/leadership growth
  - CI fellows cohort moves to mid-career

Growing Capacity - 2025

- CCC 2025 – new opportunities
  - Dozens of alumni, now mid-career
  - Opportunities to bring new ideas/activities online
  - Established CS participation in boards/organizations

- CCC 2025 future?
  - More external engagement – more varied communities, more diversity – more "delegation"
  - New activities driven new needs of a much larger and more diverse community
  - CCC still active in catalyzing and driving national priorities

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