CI-WATER
A Utah-Wyoming Cyberinfrastructure
Water Modeling Collaboration

Goal: Enhance STEM Learning and Water Science Engagement

Team 4 – Laura Hunter

October 2014

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Teachers K12

- Curriculum by UEN and BYU
- UT Teacher Workshop by GSLC
- Toolkits by WY EPSCoR & NHMU
- Symposia – Evening Event

Students K12

- Summer Research for High Schoolers
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- Code Camps by USU and BYU
- Water/Cyber Posters by Students
- Symposia – Evening Event

Higher Ed

- CI-WATER Posters
- Hydroinform-atics Course
- Presentations and Publications
- Poster Sessions

ALL

- CI-WATER.org

General Public

- Symposia – Evening Events
- Social Media
- Water Professionals
- Broadcast Water Week
- STEM and CI-WATER Videos

Curriculum Development

- Developed from 2013 CI-WATER Summer Institute with WY and UT science teachers
- Includes interactives, video, game, web pages, printable, GIS activity
- Will be online formatted for all devices
- Promotion
  - Proposal submitted for Utah Science Teachers Association Conference
  - Early Spring launch with webinars, workshops, E-blasts, news items, social media
- Topics
  - Manage a Watershed 1.0
  - Why We Need Models
  - Pick-A-Model
  - What You Can Do with Models
  - Modeling in Action: Water in the West
  - Manage a Watershed Print-and-Go
  - GIS as a Model

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Teachers K12

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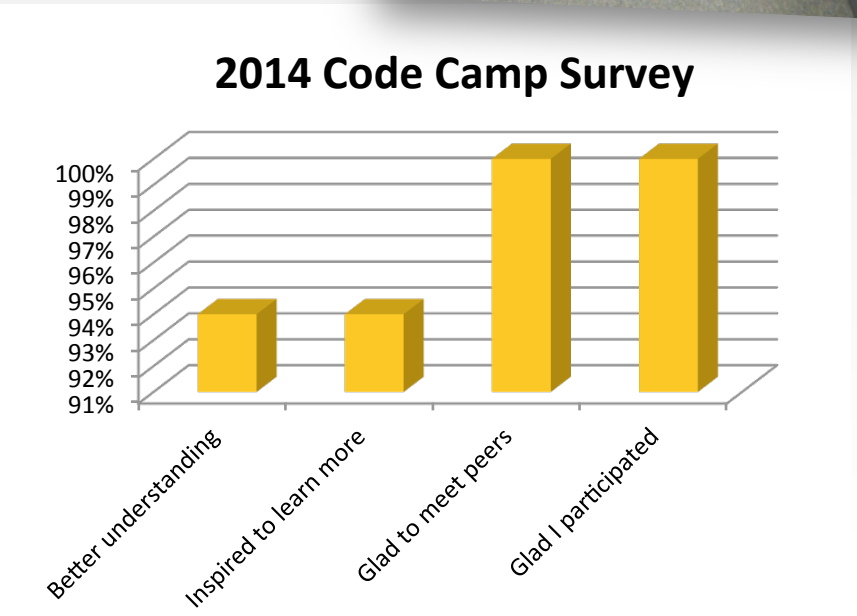
Students K12

Code Camp

USU, July 10, 2014

- 18 students completed evaluation
- Solved real-life code challenges, worked in teams
- Toured HPC facilities
- Learned from CI-WATER faculty and graduate students



Other Educator Resources & Outreach

- CI-WATER Teaching Toolboxes
  - 22 teachers, 504 students
  - Booked solid through December 6
- UEN Faculty Lounge
  - May 8, 2014
  - 13 participants (live)

Hydroinformatics Course

- Fall 2014 – 3rd time offered
- Curriculum: information management, data modeling, collaboration
- 1st: Multi-institution course team-taught by USU, BYU, UofU, (four professors) cross-listed course
- 1st: use of interactive video conferencing, Canvas LMS
- Accepted for American Society for Engineering Education

Annual Conference

Hydroinformatics 2014

- Expanded from 3 to 5 universities
  - Added UWYO (Fred Ogden) and UVA (Jon Goodall)
- 44 Total Students
  - 7 at USU
  - 8 at UofU
  - 12 at UVA
  - 9 at BYU
  - 8 at UWYO
- 8 females, 36 males

Hydroinformatics 2014

- Goals
  - Introduce students to cyberinfrastructure and informatics concepts
  - Better prepare students to work in data-intensive research and project environments
- Delivered simultaneously to all 5 campuses via UEN Interactive Video Conferencing
- All course materials and lecture recordings available online: https://usu.instructure.com/courses/319801

What are students saying?

- What has gone well in class?

"I have liked when each teacher adds a little to the class. That way I feel like I am getting multiple perspectives on the subjects. I also liked doing some of the examples with the professor walking us through it on our own computers in class. I think that helped iron out a lot of the initial bugs and get through the initial learning curve that could have stopped me if I was left to do it all alone."

"I'm learning so many new techniques that will be incredibly helpful in my research. I never knew about data management plans and while they are tedious, they are so helpful once they're implemented. I also have only ever dabbled in SQL up to this point and now I find myself using it more often than not. I think for an online class in general, it has gone surprisingly well - given the kinds of technical difficulties we could be facing."

What are students saying?

- How could this course be more effective in helping you learn?

"I was thinking a class forum would be nice to encourage. There could be some that feel better submitting their questions anonymously on this class forum and other could benefit from their questions specific to the homework or related topics."

"It seems like a we get just a taste of each topic. I feel like to really understand how to use the tools provided in this class it would require an entire course almost for each topic. I don't know of a good way to improve that given the current course setting but because our exposure to these software is so limited I feel like I forget a lot just after we move on to the next topic. In a nut-shell it's like trying to take a drink out of multiple fire hydrants."

Evaluation of the Multiple Instructor, Interactive Video Approach

#	Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total Responses	Mean
1	The use of the interactive video conferencing format for the course has helped my learning	0	3	7	11	8	29	3.83
2	Having multiple instructors from multiple universities has helped me learn more	0	2	6	9	12	29	4.07
3	The interactive video has helped me to establish a positive rapport with the instructors that are located away from my home university	0	4	14	5	6	29	3.45
4	The class sessions have stimulated me to think critically about the material	0	0	3	16	10	29	4.24
5	The interactive video has helped me to establish a positive rapport with the instructors that are located away from my home university	0	4	12	8	5	29	3.48
6	The interactive video has helped me meet and interact with students from other universities	3	9	7	7	3	29	2.93
7	It would have been helpful for my learning to have more time in class with the interactive video off, and planned activities having me work with classmates and local instructor	0	5	6	10	8	29	3.72

Burian, S.J., Horsburgh, J.S., Rosenberg, D.E., Ames, D.P., Hunter, L.G., and Strong, C. (2013). "Using interactive video conferencing for multi-institution, team-teaching." *American Society for Engineering Education (ASEE) Annual Conference Proceedings*, 23-26 June, 2013, Atlanta, GA, USA.

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Higher Ed

HBCU Hydrologic Modeling Workshop

- June 15-20, 2014 at UWYo
- 9 students from Jackson State, UU, U of Hawaii
- Assistant Prof from U of Alabama
- Stipend & travel reimbursement to alleviate financial and geographical barriers to participation

Presentations & Publications

As of the Annual report submitted last spring:

- Journal Articles – ~22
- Theses/Dissertations – 3
- Conference Papers & Presentations – 42

- All are cataloged/linked on the CI-WATER website

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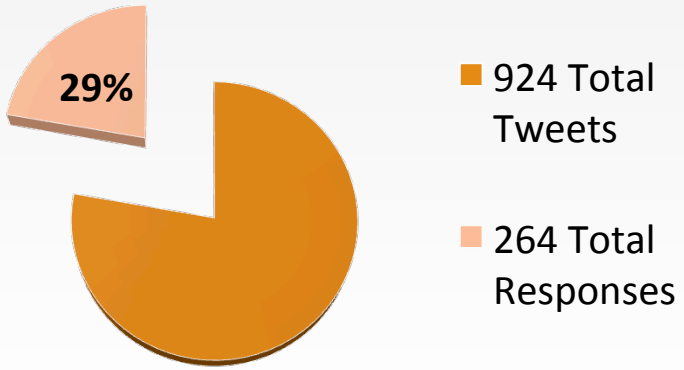
General Public

Social Media

- Twitter engagement:
  - 188 Followers
  - Reaching 88,800 with responses this year
    - "Responses" include retweets, mentions, replies & favorites
- Weekly news items on website
  - 5,261 views from inception through August 30, 2014
- Facebook up to 45 likes

Twitter Engagement
9/1/13 - 11/10/14



Broadcasts & Public Events

- Water Week on UEN-TV
  - 45 water-themed programs over 7 days broadcast statewide
- Film Screening & Panel Discussion
  - Nov 14, 2013 at KBYU
  - 22 participants
- Symphony Outreach Event
  - May 17, 2014
  - 100 participants

Video Projects

- 10 short videos
  - All on CI-WATER website
  - 748 total You Tube views
  - To be promoted via NSF platform
  - Used in presentations & workshops
- Networking with other EPSCoR communicators
  - Step 1 – Survey on video projects, completed
  - Step 2 – Webinar to share communication best practices
- Archive webinars from BYU posted to website

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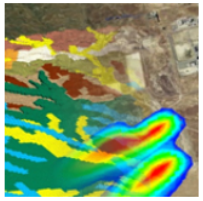
An EPSCoR Project


Cyberinfrastructure


Data & Modeling Services

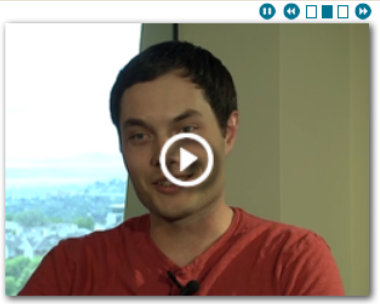

Watershed Modeling


Education & Outreach


STEM Careers


Reports & Results

Highlights



Nathan Swain: Legos and Hard Work

CI-WATER app developer Nathan Swain credits Legos and hard work for launching a career that combines his interests in engineering and computers (and lets him still have a life).

Project and Water News

Wyoming women scientists and engineers gather for new symposium

On October 30, CI-WATER partner the University of Wyoming hosted the first Wyoming Women in Science and Engineering (WWiSE) Symposium. Event highlights included a presentation by Wyoming EPSCoR Associate Director Sarah Konrad on ways to increase...
Read More...

Halloween science activities?

Halloween doesn't need to be all about ghouls and goblins. In fact, it can be all about science. Here are 3 tricks to make this Halloween a science treat: Put dry ice on center stage: Dry ice is actually...
Read More...

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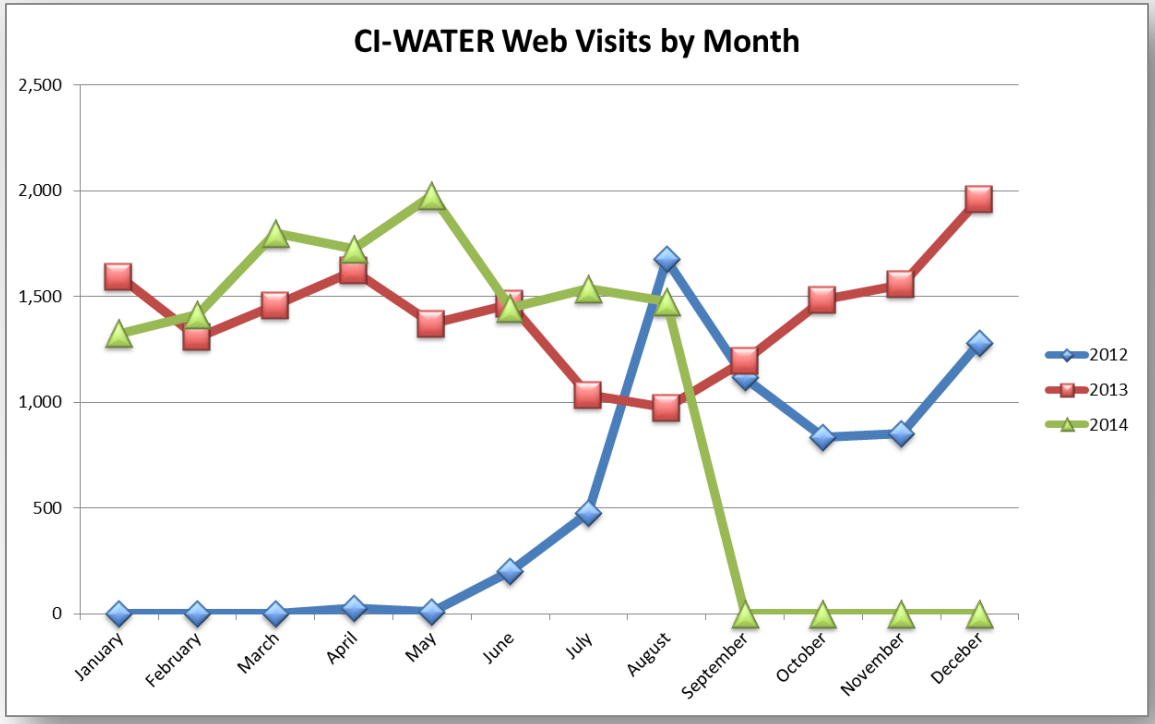
Website

- Annual visits
  - **2014 – 12,694 (Aug)**
  - 2013 – 17,017
  - 2012 – 6,459
- Total newsfeed & RSS hits through 8/14
  - 5,261



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Coming up…

- GSSHA and ADHydro short courses for other EPSCoR jurisdictions
  - Summer 2015
- Best Practices Exchange Webinar for EPSCoR Communicators
  - Spring 2015
- E-Tutorial for Teaching Toolboxes
  - Summer 2015
- Launch of CI-WATER interactives

Challenges & Opportunities

Identified Last Year	CI-WATER Outreach & Ed Response
How to keep website engaging and useful?	Content updated regularly with information for diverse audiences
How to better serve minority students, women, rural?	Direct promotion of events such as Code Camp and HBCU research experience to target audiences.
Is outreach-engagement balanced across institutions?	Utah communication specialist makes site visits to Utah locations, collaborates with Wyoming counterpart to support coverage.
How can we make the most use of new content?	CI-WATER Videos – promoted via social media & broadcast; K12 Curriculum promo plan in place; Hydroinformatics Course & Student Projects
How can we better support and tie in with iUTAH?	Cross-promotion on websites and participation in iUTAH communication projects

Strengths / Next Steps

- Delivering on goals in proposal; on schedule & on budget
- Integrated team; collaborations across institutions & jurisdictions
- Expanded capacity with video production, transferring to iUTAH
  - Opportunity to feed national program with PBS partners
  - Industry publication NSF best practices for communicators
- Final symposium this Spring with CI-WATER team, students, and water industry professionals