



A Utah-Wyoming Cyberinfrastructure
Water Modeling Collaboration



Goal: Enhance STEM Learning and Water Science Engagement

Team 4 – Laura Hunter
May 2013



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

Toolkits by WY
EPSCoR &
NHMU

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

Symposia

ALL

CI-WATER.org

General
Public

Symposia –
Evening Event

Social Media

Water
Professionals

Broadcast
Water Week

STEM and CI-
WATER Videos



| | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 30 | 34 | 33 | 38 | 39 | 37 | 38 | 39 | 38 | 38 | 39 | 39 | 39 | 38 | 37 | 36 | 35 | 36 | 37 | 38 | 39 | 38 | 39 | 35 | 34 |
| 31 | 35 | 38 | 39 | 37 | 36 | 35 | 36 | 37 | 39 | 38 | 37 | 35 | 36 | 36 | 35 | 33 | 35 | 36 | 37 | 38 | 35 | 36 | 39 | 33 |
| 30 | 34 | 37 | 36 | 37 | 35 | 32 | 34 | 35 | 37 | 35 | 34 | 33 | 32 | 33 | 34 | 32 | 31 | 32 | 34 | 35 | 34 | 33 | 35 | 32 |
| 30 | 33 | 34 | 32 | 34 | 35 | 33 | 31 | 33 | 34 | 33 | 31 | 31 | 30 | 31 | 32 | 33 | 31 | 28 | 30 | 33 | 31 | 30 | 32 | 29 |
| 27 | 34 | 31 | 29 | 30 | 31 | 32 | 29 | 31 | 31 | 30 | 31 | 30 | 29 | 29 | 31 | 30 | 28 | 26 | 27 | 29 | 28 | 27 | 30 | 26 |
| 25 | 31 | 30 | 29 | 26 | 27 | 28 | 29 | 26 | 28 | 27 | 29 | 28 | 27 | 26 | 27 | 28 | 27 | 26 | 24 | 26 | 24 | 27 | 29 | 25 |
| 24 | 28 | 28 | 26 | 24 | 26 | 27 | 28 | 26 | 24 | 26 | 27 | 28 | 26 | 25 | 23 | 25 | 26 | 24 | 22 | 23 | 22 | 24 | 27 | 23 |
| 24 | 26 | 25 | 23 | 22 | 24 | 25 | 24 | 23 | 22 | 23 | 24 | 26 | 26 | 24 | 21 | 22 | 23 | 23 | 21 | 20 | 22 | 24 | 26 | 23 |
| 25 | 22 | 24 | 23 | 21 | 20 | 21 | 21 | 20 | 21 | 22 | 22 | 23 | 23 | 22 | 21 | 19 | 20 | 22 | 20 | 18 | 19 | 22 | 26 | 22 |
| 23 | 24 | 20 | 21 | 19 | 18 | 19 | 20 | 18 | 20 | 20 | 19 | 20 | 19 | 19 | 18 | 17 | 18 | 19 | 16 | 18 | 20 | 23 | 27 | 21 |
| 20 | 22 | 20 | 18 | 16 | 17 | 18 | 16 | 18 | 19 | 18 | 18 | 18 | 18 | 17 | 18 | 17 | 15 | 15 | 17 | 19 | 22 | 24 | 26 | 21 |
| 19 | 20 | 19 | 18 | 17 | 14 | 14 | 15 | 16 | 16 | 17 | 17 | 16 | 16 | 15 | 16 | 14 | 14 | 16 | 18 | 19 | 20 | 22 | 25 | 20 |
| 17 | 18 | 17 | 16 | 15 | 13 | 13 | 14 | 14 | 13 | 15 | 16 | 17 | 15 | 14 | 13 | 13 | 13 | 15 | 16 | 17 | 18 | 20 | 23 | 20 |
| 14 | 16 | 17 | 14 | 15 | 12 | 12 | 13 | 12 | 13 | 16 | 17 | 18 | 15 | 15 | 14 | 13 | 12 | 12 | 13 | 14 | 15 | 16 | 21 | 19 |
| 13 | 14 | 15 | 13 | 14 | 12 | 11 | 11 | 12 | 14 | 17 | 20 | 19 | 17 | 15 | 13 | 12 | 11 | 11 | 12 | 13 | 12 | 14 | 19 | 20 |
| 12 | 14 | 13 | 11 | 12 | 11 | 10 | 10 | 11 | 13 | 16 | 18 | 18 | 18 | 15 | 12 | 11 | 10 | 10 | 11 | 10 | 12 | 13 | 17 | 18 |
| 10 | 11 | 12 | 11 | 9 | 10 | 9 | 9 | 10 | 12 | 15 | 18 | 17 | 16 | 14 | 12 | 11 | 9 | 9 | 9 | 11 | 12 | 14 | 16 | 17 |
| 9 | 12 | 13 | 10 | 9 | 8 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 14 | 11 | 9 | 8 | 8 | 9 | 10 | 11 | 12 | 13 | 15 | 14 |
| 9 | 12 | 10 | 9 | 8 | 7 | 7 | 8 | 8 | 9 | 11 | 13 | 12 | 12 | 10 | 8 | 7 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 13 |
| 9 | 12 | 11 | 9 | 8 | 7 | 6 | 6 | 7 | 7 | 8 | 10 | 10 | 11 | 8 | 6 | 6 | 7 | 7 | 8 | 9 | 11 | 13 | 11 | 10 |
| 8 | 11 | 9 | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 8 | 9 | 9 | 7 | 6 | 5 | 5 | 6 | 6 | 7 | 8 | 10 | 12 | 9 | 7 |
| 7 | 8 | 10 | 7 | 5 | 5 | 4 | 4 | 5 | 5 | 6 | 7 | 7 | 6 | 5 | 4 | 4 | 5 | 5 | 6 | 7 | 8 | 10 | 7 | 5 |
| 6 | 7 | 8 | 7 | 5 | 4 | 4 | 3 | 3 | 3 | 4 | 5 | 6 | 4 | 3 | 3 | 3 | 4 | 5 | 5 | 6 | 7 | 8 | 6 | 4 |
| 4 | 5 | 6 | 5 | 4 | 3 | 3 | 2 | 2 | 2 | 3 | 4 | 4 | 3 | 2 | 2 | 2 | 3 | 3 | 4 | 5 | 6 | 5 | 4 | 3 |
| 2 | 3 | 4 | 5 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 3 | 4 | 5 | 4 | 3 | 2 |

Watersheds Board Game: be the first to move a quantity of water from the mountains to the valley.

Objective: understand watershed concepts and how water behaves in nature.



| DATA | |
|----------------|-----------|
| Season | Spring |
| Temperature | 70 |
| Wind direction | S |
| Air pressure | Low |
| CHALLENGE | |
| Sky cover | 6 |
| Rain | 0.8 |
| Snow | 0 |
| Type | 4-Thunder |

| DATA | |
|----------------|--------|
| Season | Spring |
| Temperature | 60 |
| Wind direction | S |
| Air pressure | Low |
| CHALLENGE | |
| Sky cover | 7 |
| Rain | 0.6 |
| Snow | 0 |
| Type | 1-Fog |

| DATA | |
|----------------|-------|
| Season | Fall |
| Temperature | 65 |
| Wind direction | E |
| Air pressure | Low |
| CHALLENGE | |
| Sky cover | 7 |
| Rain | 0.5 |
| Snow | 0 |
| Type | 1-Fog |

| DATA | |
|----------------|-----------|
| Season | Fall |
| Temperature | 60 |
| Wind direction | S |
| Air pressure | Low |
| CHALLENGE | |
| Sky cover | 9 |
| Rain | 0.4 |
| Snow | 0 |
| Type | 4-Thunder |

| DATA | |
|----------------|-----------|
| Season | Summer |
| Temperature | 75 |
| Wind direction | S |
| Air pressure | Medium |
| CHALLENGE | |
| Sky cover | 5 |
| Rain | 0.4 |
| Snow | 0 |
| Type | 4-Thunder |

| DATA | |
|----------------|--------|
| Season | Summer |
| Temperature | 80 |
| Wind direction | E |
| Air pressure | Medium |
| CHALLENGE | |
| Sky cover | 7 |
| Rain | 0.3 |
| Snow | 0 |
| Type | 1-Fog |

| DATA | |
|----------------|--------|
| Season | Fall |
| Temperature | 55 |
| Wind direction | W |
| Air pressure | Medium |
| CHALLENGE | |
| Sky cover | 6 |
| Rain | 0.3 |
| Snow | 0 |
| Type | 1-Fog |

| DATA | |
|----------------|-----------|
| Season | Spring |
| Temperature | 70 |
| Wind direction | W |
| Air pressure | Medium |
| CHALLENGE | |
| Sky cover | 3 |
| Rain | 0.3 |
| Snow | 0 |
| Type | 4-Thunder |

Forecaster Card Game: Guess card values using information data of weather conditions the previous day and then challenge opponent card values.

Objective: understand relationship between weather factors and factors that contribute to weather such as topography.



Professional Development Summer Institute

- Objectives:
 - Learn about CI-WATER
 - Learn from CI-WATER reserachers
 - Develop grade 9-12 Curricula that explore the use of models to predict the impact of policy decisions on water systems
 - Stipend \$450, lodging, transportation for WY, lunches, 2 UU Graduate credits
- June 24-28 at University of Utah
- 14 Teachers Confirmed (UT & WY)



Toolkits:

- water
- modeling
- scientific inquiry

Permanent at NHMU, University WY, WY Science Zone
Fall: teacher check-out



- water quality testing kits
- 3-D molecular water kits
- petri dishes
- various collection jars and vials
- a groundwater model
- a soil/sediment collector
- GPS
- a pH kit
- a thermometer
- various calorimeters for measuring nitrates and phosphates
- Hydropoly game
- role-playing equipment
- field guides and books
- Instructor's guide



Symposia

- 2012

- Broadcast Water Week
- Industry partners and students
- About CI-WATER
- Keynotes: Brad Udall, Director
CU-NOAA Western Water
Assessment
- Dr. Chris Emdin, Professor/Author,
Columbia University

- 2013

- 7:00 pm tonight
- Keynote: Dr. Miriah Meyer,
Information Visualization
 - Assistant Professor, School of
Computing, University of Utah
 - “Top Innovator” list of young
innovators by *Technology Review*
 - #24 of the 100 Most Creative People
in Business 2012 by *Fast Company*
 - 2013 TED Fellow



Summer Research Apprentice Program (SRAP)

- June 9-July 20
- 22 Participants
 - First Generation
 - Minority
 - Females in STEM
- Summer Stipend
- Room & Board





Code Camps – introduce students to education and career opportunities in engineering & applied computer programs

BYU June 11

- Tour College of Engineering Labs
- Coding workshops; solve real world problems
- Science and engineering games and contests
- Work with faculty and graduate students

USU July 11

- Tour HPC facilities
- Solve real-life code challenges
- Learn about and interact with CI-WATER faculty and graduate students
- Work in teams, compete
- Get more involved in CI-WATER

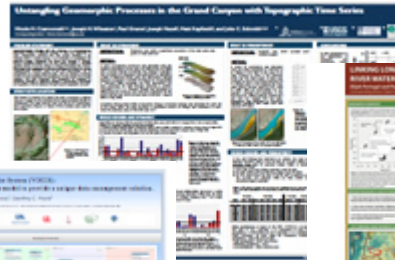
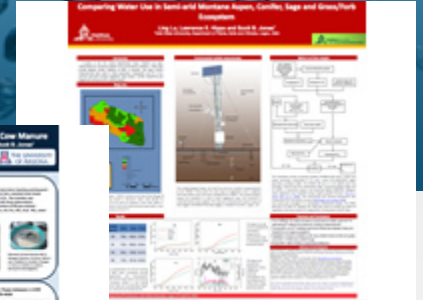
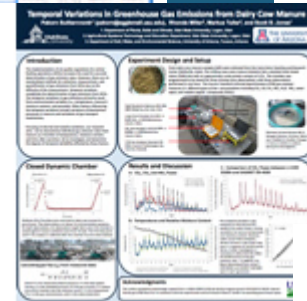


2013 Symposium:
electronic posters
from high schools
and graduate
students





Virtual Posters





Hydroinformatics Course

- Fall semester 2012; planned for Fall 2013
- 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



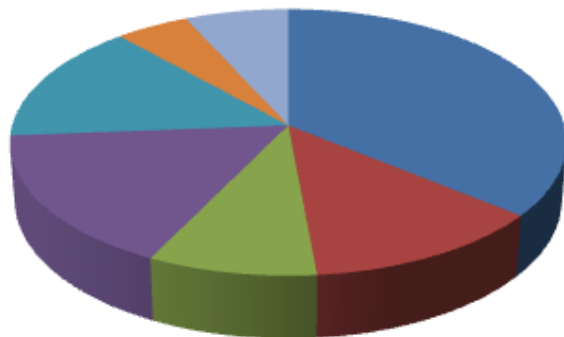


Media Social and Regular



- 42 news items (exceeded goal 1/week)
- Facebook 26 Followers; need 30 “likes” for statistics
- Twitter 103 Followers

- Two Press Releases re: May Events to Utah Press Association
- Community Calendar notices to
 - UVU Review
 - WSU Signpost
 - SL Trib features and technology writer
 - UofU Chronicle
 - Spingo
 - City Weekly
 - UofU Communications
 - BYU Universe
 - Catalyst Magazine
- 363 Visits to RSS Newsfeed Page



- Scientists & science communicators
- EPSCoRS
- Community/govt orgs
- Education
- Citizens
- Other



Broadcast Water Week

UEN-TV Water Week Programs for May 2013

Tune into UEN-TV May 5 – May 11 for Water Wise Week, a block of water-themed programs aired in conjunction with the CI-WATER water science project.

[Find your local UEN-TV carrier](#)

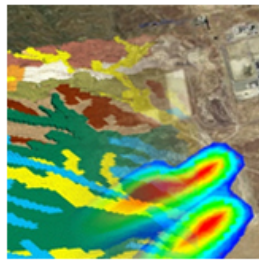
[Sunday, May 5th](#) | [Monday, May 6th](#) | [Tuesday, May 7th](#) | [Wednesday, May 8th](#) | [Thursday, May 9th](#) | [Friday, May 10th](#) | [Saturday, May 11th](#)

Sunday, May 5th

| Time | Program | Keywords |
|---------|--------------------------------------------------------------|------------------------|
| 5:30 pm | P. Allen Smith's Garden Home: The Water Show | Waterwise home |
| 6:00 pm | Wetlands: The Drain Game | Wetlands |
| 6:30 pm | Water: The Lifeblood of Energy | Western region, energy |
| 7:00 pm | Potomac: The River Runs Through Us | River systems |
| 7:30 pm | Hudson River Journeys | River systems |



Cyberinfrastructure



Data & Modeling
Services



Watershed Modeling



Education & Outreach



STEM Careers



Reports & Results

Highlights



Summer Research Experience

CI-WATER is recruiting undergraduate students from Wyoming and Utah to participate in a month-long research opportunity at the University of Wyoming's Laramie campus. Application Deadline May 24, 2013 [Learn More...](#)

Project and Water News

[USU camp for teens who like to code on July 11](#)

CI-WATER invites high school students to solve real-life code challenges at the Utah State University Summer Code Camp on July 11. During this free, one-day event, participants will learn and practice computer coding, work in teams and...

[Read More...](#)



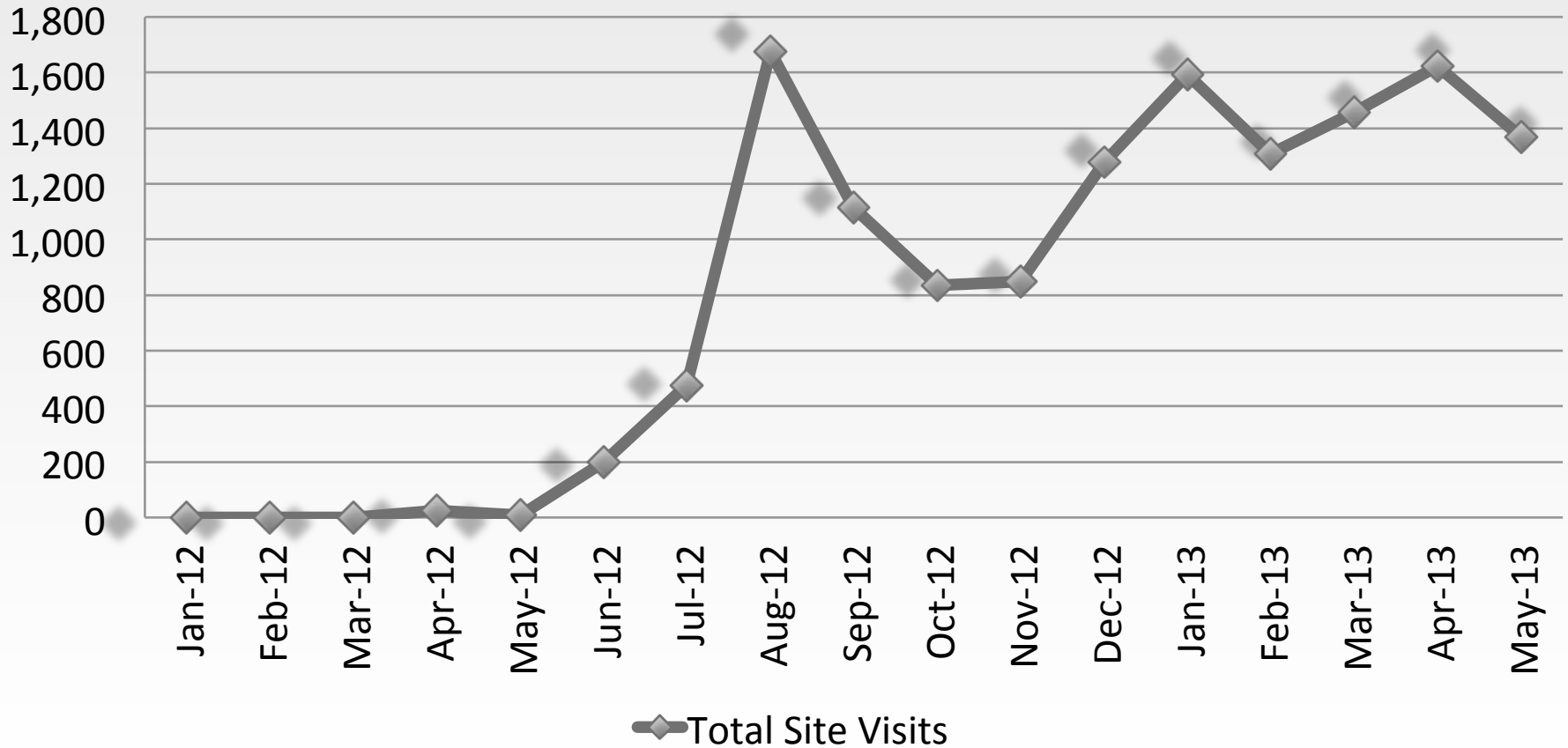
[Prizes, pizza and code: BYU to host camp June 11](#)

CI-WATER invites high school students to sign up for the 2013 BYU Engineering Code Camp. This one-day program will help students learn how computer simulations are used to solve fascinating problems, including water resource planning and...

[Read More...](#)

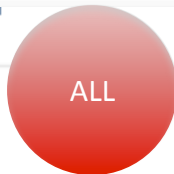


Total Site Visits



Clicks with more than: 0.10%

20.2% 22%


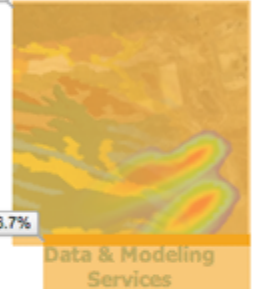
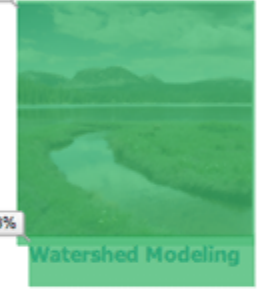

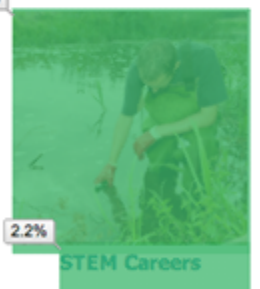



3.2% About the Gr 4.8% Partn 0.7% Contact L



A Utah-Wyoming Cyberinfrastructure Water Modeling Collaboration



| | | | | | |
|------|------------------------------------------------------------------------------------|------|------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------|
| 5.2% |  | 6.7% |  | 5.8% |  |
| 5.2% | Cyberinfrastructure | 6.7% | Data & Modeling Services | 5.8% | Watershed Modeling |
| 7.9% |  | 2.2% |  | 1.9% |  |
| 7.9% | Education & Outreach | 2.2% | STEM Careers | 1.9% | Reports & Results |

Highlights



Summer Research Experience for Undergraduates

High Performance Computing and Watershed Modeling

June 17 - July 19
University of Wyoming, Laramie

Summer Research Experience

CI-WATER is recruiting undergraduate students from Wyoming and Utah to participate in a month-long research opportunity at the University of Wyoming's Laramie campus. Application Deadline May 24, 2013

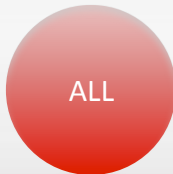
[Learn More](#)

Project and Water News

15% **USU camp for teens who like to code on July 11**

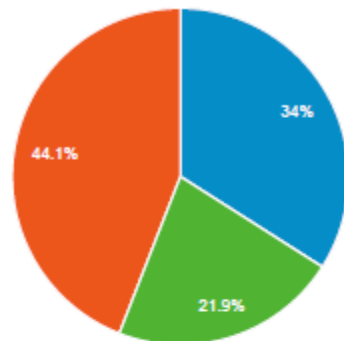
15% CI-WATER invites high school students to solve real-life code challenges at the Utah State University Summer Code Camp on July 11. During this free, one-day event, participants will learn and practice computer coding, work in teams and...

January-May 2013



2,196 people visited this site

■ Search Traffic ■ Referral Traffic ■ Direct Traffic ■ Campaigns



| Source | Visits | % Visits |
|-------------------------------------------------------------------|--------|----------|
| 1. uwo.edu | 187 | 38.88% |
| 2. emrl.byu.edu | 31 | 6.44% |
| 3. uen.org | 31 | 6.44% |
| 4. utepscor.org | 30 | 6.24% |
| 5. facebook.com | 20 | 4.16% |
| 6. ci-water.dev.uen.org | 14 | 2.91% |
| 7. t.co | 14 | 2.91% |
| 8. google.com | 11 | 2.29% |
| 9. iutahws.uwrl.usu.edu | 10 | 2.08% |
| 10. urbanwater.utah.edu | 10 | 2.08% |



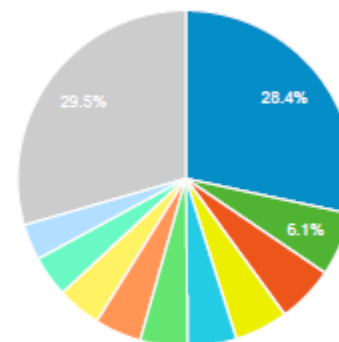
Page

Pageviews

Pageviews

Contribution to total: Pageviews

| | | 7,048 % of Total: 100.00% (7,048) | 7,048 % of Total: 100.00% (7,048) |
|-----|---------------------------------|--------------------------------------|--------------------------------------|
| 1. | / | 1,999 | 28.36% |
| 2. | /symposium/index.html | 431 | 6.12% |
| 3. | /symposium/education_event.html | 388 | 5.51% |
| 4. | /project_news.php?page=1 | 363 | 5.15% |
| 5. | /community.html | 331 | 4.70% |
| 6. | /index.php | 321 | 4.55% |
| 7. | /index_new.php | 317 | 4.50% |
| 8. | /partners.html | 298 | 4.23% |
| 9. | /water_model.html | 279 | 3.96% |
| 10. | /water_shed.html | 244 | 3.46% |





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
- Toolkits by WY EPSCoR & NHMU
- Code Camps by USU and BYU
- Water/Cyber Posters by Students
- Symposia – Evening Event

Higher Ed

- CI-WATER Posters
- Hydroinformatics Course
- Presentations and Publications
- Symposia

General Public

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

ALL

- CI-WATER.org



Strengths

- Delivering on goals in proposal
- Integrated team - example 8 articles cross-promoted on WY blog resulted in increased traffic
- Innovative solutions
- Communication
 - Videos
 - RSS Feeds
 - Website
 - Social Media
- Integration with iUTAH and Cyberinfrastructure EPSCoR projects



Challenges & Opportunities

- How to keep website engaging and useful?
- How to better serve minority students, women, rural?
- Is outreach-engagement balanced across institutions?
- How can we make the most use of new content?
 - CI-WATER Videos
 - K-12 Curriculum
 - Hydroinformatics Course & Student Projects
- How can we better support and tie in with iUTAH?
- Are there other opportunities we haven't fully developed?