Appendices

These appendices contain the follow material:

- Full text of the five **endstates** used in the workshop
- Full text of the 111 **events** used in the workshop sorted into categories
- Full results of the voting on **current expectations**
  Note the definitions of each column on this report:
  HU%: percentage of participants that voted that event highly unlikely (<25% probable)
  UN%: percentage of participants that voted that event uncertain
  HL%: percentage of participants that voted that event highly likely (>75% probable)
  Cer%: HL% minus HU%; Cer% ≥ 50 makes an event highly likely for the entire group and Cer% ≤ -50 makes an event highly unlikely for the entire group
  HU: "Y" means event is highly unlikely for the entire group
  HL: "Y" means event is highly likely for the entire group
- Full results of the **selection of events by each scenario team**
  Note the definitions of each column on this report:
  Columns labeled **A** through **E**:
  a plus sign (+) indicates the event is positive for that team's scenario and
  a minus sign (-) indicates the event is negative for that team's scenario
  blank indicates it is not part of that team's scenario
  CM: common event where 4 or 5 of the teams chose this event for their scenario
  HU: event was voted highly unlikely in current expectations exercise
  HL: event was voted highly likely in current expectations exercise
- Southwest Climate Science Center Fact Index

2020 Endstate A

The SW CSC puts most of its energy into funding, managing and coordinating major research, guided by the needs of resource managers but not overly constrained by them. The main role of the SW CSC is pulling together interdisciplinary, high-quality teams of PIs to tackle foundational research problems at the nexus of climate and ecosystems. The application of this research is primarily the role of the LCCs and the stakeholders themselves rather than the scientists. The SW CSC strengthens its relationship with the five LCCs in its region and the Climate Hubs, depending on them as the main interface to stakeholders. It relies on them for the translation and tactical application of existing science as well as education and outreach. Regular interactions with these groups ensures that the major research findings are quickly translated and integrated into resource manager planning processes. Making a clear distinction between the LCCs and the CSC plays well in DC.

The university partners of the SW CSC now collaborate regularly, and there are additional partners that expand the capabilities of the consortium. They are able to do more significant research by pooling resources and expertise across additional partners. Many of the problems in climate and ecology (e.g. recognition of thresholds in ecosystem transformations) are big, complex and need significant computing resources and teams of collaborators. They can't be done effectively at one institution. Encouraged by headquarters, the SW CSC fosters a culture of collaboration and sharing among researchers, including those in other USGS science centers. Solving big problems in science increasingly requires large, distributed teams led by visionary scientists, and the climate ecology nexus is certainly no exception. Gone are the days of the lone researcher. Researchers increasingly contribute a piece to a larger effort and need to feel comfortable in that distributed, multidisciplinary model.

The SW CSC's collaborative approach results in a set of "big science" findings, published in top scholarly journals. They provide the foundational science required to address major real-world problems facing the region – questions that are often landscape-scale and systemic in nature. These types of projects couldn't be implemented by anyone other than the SW CSC with its skills, funding and mandate. It answers really big questions, like the cascading impacts of drought, best approaches to handling ecosystem transformations, and the adaptive capacity of regional species. It funds development of models of major ecosystems in the region and links them to climate models.

The SW CSC creates a longer-term, broader research agenda for climate adaptation, i.e. multiple projects that add up to something bigger over a longer time. It gets beyond just a collection of separate siloed projects. Compared to some other organizations, where research priorities shift from year to year and it is hard to sustain a line of investigation with a dedicated cadre of researchers, the work of the SW CSC is seen as adding up to larger results and capabilities. With the demand so much greater than the available resources, being more strategic in its priorities and planning is critical. This starts with the SW CSC convening yearly planning meetings to discuss current efforts and develop new major research programs.

Over time, multiple CSCs participate with the SW CSC in this collaborative definition of a bigger science agenda. The CSCs also begin to co-write and co-fund national RFPs which result in projects with PIs from multiple CSCs. One example is species migrations, short distance and long, that turns out to be at the heart of managing climate change adaptation and particularly ecological drought impacts. The CSCs work together to lay out national road maps for assisted migration strategies.

The CSCs are fundamentally academic institutions and they can't really escape that affiliation. To many on-the-ground resource managers, scientists speak a different language and look at issues differently. Rather than overcome these deep differences, the CSCs rely on the LCCs and others for stakeholder engagement and maintain their identity as providers of strong academic research that provides the fundamental knowledge that actionable and applied science must be built on.

2020 Endstate B

In addition to funding and managing its own research project portfolio, the SW CSC has become known as the convener of physical scientists, ecologists, social scientists, as well as representatives from LCCs, RISAs, Climate Hubs, NGOs, local, state and Federal governments, tribes, Mexico, and others. They are all needed to attack wicked climate adaptation problems that inherently cross organizational and jurisdictional boundaries. Its efforts have slowly knit together all the different regional groups into an effective sharing network and inter-dependent system. Collaborative groups focused on specific issues, such as migration corridors or the role of drought/fire in ecosystem transformations, often form after a SW CSC meeting, then continue working together for months or years. SW CSC research focuses on the science needs identified by these groups, and also on the social sciences aspects such as maximizing effective large group collaborations and decision making.

The region needs a diversity of approaches. Each member of the network, and in particular each LCC, is quite different in its management style, focus, and ways of operating. This is driven by the characteristics of their landscape, as well as by their partners, and how long they have been active. The SW CSC connects with them all, helping each identify how they fit into the larger picture, and how their work might complement that of others. This is time consuming but it makes the entire climate science and land management system more effective and efficient.

Tangible benefits come from regular and ad hoc meetings convened and coordinated by the SW CSC, to share research and needs across the network. More regular communication and reporting results in less duplication of effort and more collaboration on research needed by multiple parties. Administrative rules have been loosened so that hosting meetings and travel to meetings is somewhat easier than it had been in the early years of the CSCs.

One of the hardest problems is dealing with potential step-function changes in ecosystems, especially after major disturbances, which often require stepping back and rethinking overall conservation goals and strategies in light of potential future climate conditions. The SW CSC convenes numerous meetings to get these disparate agencies better aligned in their conservation strategies. They foster a far more interactive and collaborative effort to use the best of all the work to synthesize views of whole landscape ecosystems. Most lands are complex multi-use systems, and only a whole-system view will help determine the best course of action on the ground. The SW CSC develops a repertoire of meeting formats, many of which include participatory engagement or facilitated decision making. It uses a variety of distributed collaboration tools to make remote interaction more productive and leverages social network technology to keep everyone in touch and coordinated.

The eight CSCs also now function as a real network. They share not only data and results but also processes and best practices. The CSCs all remain quite different in focus, process and practices, but they share common objectives and standards necessary for data sharing and collaboration. They are known for helping a wide array of organizations and agencies work together better at multiple levels from local to international. The national system of climate change adaptation researchers is better organized, more aware of each other's issues, better able to avoid duplication, and there are much richer information flows.

The key to melding such diverse groups' efforts was creating a shared vision and alignment across regional actors (CSC, LCC, RISAs, Hubs, universities, research institutes, land managers, NGOs, tribes, local and regional climate change adaptation organizations in the southwest) - a shared understanding of the important issues and priorities in addressing them. Everyone is less confused and all are relieved to have someone lead the effort to knit it all together. The CSC has stepped up to the podium to coordinate and conduct the complex orchestra and guide it through a confusing and evolving score.

2020 Endstate C

The SW CSC stakes out knowledge co-production resulting in actionable science as its focus area. It develops best practices for connecting practitioners and researchers, for integrating climate science into resource decision making, and for evaluating the effectiveness of the research and resource management decisions. Better decisions are made when both science and practical stakeholder knowledge are combined. The SW CSC funds the science, including the social science of stakeholder interaction strategies. It develops a repertoire of practices for achieving fruitful dialogue between scientists and practitioners. No single technique proves best. You need a range of approaches depending on the people and problems involved. It's the deep personal relationships with frontline resource managers that give the SW CSC the kind of detailed guidance its researchers need.

The SW CSC evolves to the point where it is involved with specific resource management decisions in the region. The SW CSC and its PIs are more aware of the cycle of decision-making in their stakeholders, and structure projects to be more responsive to decision points. It has done a great job of getting researchers to think in terms of usability of their work. Long-term collegial relationships form between resource managers and scientists and the level of trust is increased. Researchers get ideas for new projects from their interactions with stakeholders. Many RFPs for new work require meetings up front with stakeholders to collaboratively specify the research question, progress meetings to tune the research program, and support while the results are put into practice. In some cases, seed funding is provided for an even earlier collaborative process to develop the specs for one or more research projects. Evaluations of project results are used to adjust and tune the approaches for greater impact and timeliness. They also provide evidence of the superiority of co-production over traditional processes.

The SW CSC works with LCCs, government agencies, NGOs, and tribal agencies to help resource managers use existing science as well as new research results. In reality, most of the needs are not for new science, but rather how to use the results of existing models and research. This translation is a skill set that needs to be developed and the CSC offers training geared to the needs of different types of resource managers: forests, wildlife, water, soil, etc.

The SW CSC integrates physical and social sciences to increase effectiveness of its approaches to co-production. The social science researchers look at how organizations make decisions, identifying different cultures and approaches as well as ways of engaging different types of people in climate issues based on their responsibilities, level in an organization, culture of the organization they are in, etc. At least one key person has been added to the SW CSC staff with a background primarily in how people and organizations work.

The SW CSC becomes highly skilled at matching scientists and resource managers. Two-way productive relationships require trust and take time to develop. Many scientists don't come to this easily and don't see why they need to do all this extra work at first. They come around as they begin to see that these dialogues can also result in a continuing stream of further work with the same stakeholders.

In reality, what's needed is a new culture within a subset of the research community, where applicability and close relationships with those who need to make resource management decisions are valued over intellectual curiosity and expanding the limits of human knowledge. It is clear now this is a different kind of research enterprise than the one at NSF. A crop of young scientists who have been trained as graduate students and post docs now think about the applicability of their work and making sure it delivers value to society. In DC, this is viewed as a major accomplishment of great future impact. Society begins to see the value that well-funded, capable scientists bring to their community.

2020 Endstate D

The SW CSC structures itself as an information service, the "go to" organization for Southwest-relevant climate science information. Key research about the climate-ecosystem nexus is vetted, translated, and becomes the trusted baseline for regional information. Resource managers and other stakeholders can make requests for climate science relevant to a problem or decision they are working on, with responses typically delivered in a few days. SW CSC has adopted the role of locator and interpreter of climate science for regional adaptation organizations. The service focuses on basic climate science and adaptation, the nature of the forecasts and projections, and their uncertainty, all tied to specific geographies, habitats and decision-making cycles. Today, decisions are more temporary and contingent – revisited regularly as more is learned from responses to the next unpredicted change. This results in more frequent requests for information and interpretation.

The SW CSC, representing USGS, DOI and university science, has credibility most other organizations of the Federal Government don't in the climate change arena. It helps that they are not a regulatory authority. It created an integrated interface for climate science results and expertise, a clearing house of information on what projects are underway, and who is interested in what. It groups relevant science together regardless of source, pointing out areas of saturation or dearth of work, which can initiate new focused research projects. Before a new science or adaptation project is started, a quick check with the CSC will provide guidance on others to contact who are working in the area. This is supported by strong social media networks, not just person-to-person phone calls. Managers can ask questions online, often getting answers from other managers as well as the CSC.

Most of the SW CSCs funding goes into translating, integrating and repackaging what has already been done rather than generating lots of new peer reviewed published work. Typical practitioners today don't need big new science. Most of what they need has already been produced, but it is not in a form that is easily found, assimilated or applied. This is the kind of work that can be done in the CSC that would never get very far in a traditional university setting because it isn't breaking new ground. The CSC can do things that a university can't, such as develop processes or a tool for synthesizing, packaging, visualizing and interpreting research results so they are applicable to the broadest set of possible users. Tools that integrate into stakeholder decision-making processes are a major emphasis. These new tools are also accompanied with training and some amount of hand holding, at least at first. These are usually developed in partnership with one or more LCCs.

There is a huge need to bring some order, quality assurance and standards to the chaotic plethora of climate and ecological models. An example is a consistent set of downscaled climate science models that can be shared across the southwest, paired with an advisory service on how to best use the information, its limits, and what it really means. Having a single source of data, models, and frameworks saves the web of resource managers, LCCs, Hubs, NGOs, etc. a great deal of wasted time, and helps ensure comparability of results. Stakeholders appreciate the continuing flow of 'climate products', some updated annually or monthly, others appearing sequentially in response to requests or perceived needs.

Doing this well requires employing top-notch science translators, applied scientists, web-savvy information managers and tool builders. They publish regular newsletters with summaries and pointers to particularly good research, build tools that simplify interactive exploration of results, and develop information integration standards in partnership with both the researchers and the stakeholders.

LCCs, Climate Hubs, RISAs and resource managers applaud the SW CSC's efforts to get a handle on this research and data sprawl, to assess what's been done already and assemble the whole picture, and then establish some basic common approaches and standards. The challenge now is to keep all this up to date as new work is done.

2020 Endstate E

The SW CSC has evolved into an agile, adaptive, learning organization. It is able to quickly and robustly respond to a growing number of climate-driven crises and accelerating ecosystem changes in the region—another snowpack failure in the Sierras, a powerful El Niño event, failing monsoons, a massive heat-induced fish die-off in the Colorado River, etc. There are new needs all the time.

The climate is not the only thing changing --the field of climate change adaptation has been evolving so rapidly, that statically defining the SW CSC's role and partnerships was not possible. It continually redefined itself as new players appeared, old ones got reorganized away, funding levels changed, and new needs emerged. Much of this change happened organically and on the fly. Most have moved from incremental adaptation and resilience efforts to more transformational strategies. Inevitably, many of these organizations were also drawn into mitigation efforts. It is not only a bad idea, it is in fact impossible to set up a static network of organizations in this type of situation. Instead, you have to plan for continual adaptation if you want to succeed amidst this endless churning.

A big part of the SW CSC and its consortium is structured as a consultancy that provides senior levels of expertise to stakeholders. A major chunk of the budget funds episodic projects that last for a few hours, days, weeks or even months. Solving serious real-world problems is the consultants' number one goal and metric. The SW CSC is where the real experts reside, when a problem or a question can't be answered by an LCC or in an agency. There are experts (on staff or on call) to help with the toughest science questions – and if there isn't an answer, and it is important enough, they will spin off a fast-track research project to find the answer. Another source of research comes from crises reviews, which can reveal fundamental unanswered research questions. The SW CSC routinely publishes best practices and "FAQs" to help people find the answers themselves. Scientists and top level field people often circulate through these roles, to bring both theoretical and hands-on experience. A diverse cadre of dynamic, highly capable generalist experts has become associated with the SW CSC's interventions. Deep expertise is contracted for as needed. Having achieved a culture of learning, experimentation and openness to new ideas, they foster it in stakeholder organizations.

Concern over climate change is rising as near-term impacts begin to accumulate. With more data on what's really happening, it becomes clearer every day that we may be getting close to dangerous tipping points or the possibility of step function changes in ecosystems (e.g. replacement of forest with shrub land). Demand for climate science expertise and advice skyrocketed from frontline resource managers who saw the threats. In the more general public, ranchers, tribes and farmers didn't need fancy models to tell them the climate was changing and not for the better. Once the parade had started, the politicians started to get on board and no longer questioned the need for climate adaptation planning and input. Expert talking points for testimony before Congress are now a frequent request.

The SW CSC proactively created a set of multi-dimensional scenarios (climate, demographics, economics, land use, new regulation, etc.) as frameworks for decision making under uncertainty and helps resource managers rehearse tough decisions they may be called upon to make. The content in them is backed by hard data and regional research. Scenarios help various players to rehearse future situations and crises and thus be better prepared to respond when major events occur. The same framework of scenarios is used for environmental and social monitoring to evaluate which scenario is really playing out. Over time, monitoring reduces the uncertainty in a given projection or helps to define an updated set of scenarios.

The SW CSC streamlines its processes and organization, making it possible to respond to requests more rapidly. The SW CSC's reputation is that it is there to help, often with boots on the ground, to address difficult stakeholder needs as quickly and effectively as possible. This isn't co-production. There's no time for that.

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Event Listing

Year **Event Text** **Card # MasterID**

Number of Events: 111

External

Southwest Climate

2017 **Studies Show that Most CA Trees Will Be Out of Favored Climate at Century's End** 1
SWC1

Because of the long life of trees, changes to forest composition unfold slowly. But recent studies show that by the end of the century, most trees in CA will be out of their favored climate. There is no consensus on what will replace them, and the needed research will be difficult and very long term.

2018 **A Review Paper in *Science* Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes** 2
SWC3

Across the country, there is a big increase in ecosystems that have been fundamentally changed. Alpine meadows have disappeared in many regions. Massive fires in desert grasslands at low elevations don't come back with their pre-fire species. Research is needed to help land managers determine best next steps for management of these areas, particularly if novel ecosystems, or assembly of species, have taken hold there.

2018 **It's Just One Damned Thing After Another Out There In The Real World** 3
SWC3

In April it's yet another snowpack failure in the Sierras, in May it's a rapid expansion of cheatgrass in burned rangelands in Nevada, in June it's an unprecedented series of merging wildfires in southern Utah, in July it's a beetle outbreak that threatens the Sky Island spruce, in August, it's loss of a fish species in the dried-up Gila River headwaters, in October it's recognition that we've lost the war against buffelgrass invasion in the Lower Sonoran Desert, and a storm surge in December takes out extensive salt marshes in California. All of these require science-backed approaches for effective response.

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Event Listing

Year	Event Text	Card # MasterID
2018	**US Food Prices Increase Sharply**	4 SWC4
	The impacts of the California and Midwest droughts have sharply increased the costs of fruits, vegetables, and nuts, as well as commodity crops like wheat and soybeans. Consumers are now paying 25-45% more for these items than they were in 2014, and they are not at all happy about it. Farming in other regions has picked up market share from CA.	
2018	**Strong El Nino Brings Back Bad Old Habits**	5 SWC5
	After plentiful rain and snow during the winters of 2016 and 2017, the reservoirs are back to normal levels. Panic over the drought has subsided, and people have gone back to their old habits - watering lawns, flooding fields, planting almond trees. People are treating the drought as a one-off anomaly, not a portent of the future. Water usage is way up.	
2019	**Central Arizona Project Water Allocation Cut by 40%**	6 SWC6
	The water just isn't there after years of drought. Interstate water law creates a crisis for Arizona. Lawyers are poised to make a lot of money.	
2019	**Lake Mead Hits 1024', Colorado River Compact Open to Discussion**	7 SWC7
	Below 1,025 feet, the Lower Basin states are required to negotiate new water shortage regulations - existing regulations simply don't cover that situation. There is talk of rewriting of major water laws, including the "Law of the River" and prior appropriation more generally.	
2020	**Massive Forest Dieback Across the SW Drives Managers to Triage Priorities**	8 SWC8
	Insects, drought and fires have resulted in widespread tree death. Large areas are closed to public access due to fire risk and post flooding damage from erosion. Watershed management focuses on keeping water in systems and reducing erosion to support delivery of water downstream; quantity and quality are compromised. There is a scramble to figure out most appropriate way to restore or replace the denuded landscape, given the likelihood of these threats continuing.	

Event Listing

Year	Event Text	Card # MasterID

Stakeholder Needs

2017 **Support for Government Action on Climate Change Reaches 75% of General Population in Southwest** 9
SWC6

The impacts of climate change are more in your face in the SW. Water shortages, fires, etc. all lead to the general population understanding that the climate is changing and generally not for the better.

2017 **Recalcitrant State Governments Now Seek Help on Climate Adaptation** 10
SWC6

Driven by in-state climate disasters and rapid shifts in voter acceptance of climate change, even the states most reluctant to deal with climate change are acknowledging they need to take action, and quickly. They draw heavily on NGOs, federal agencies, and universities in their state to help them jump-start their programs.

2018 **Development of Narratives Using Analytics Develops Strong Connections to Stakeholders** 11
SWC1

Text analytics refers to the process of deriving high-quality information from text, and is useful for understanding how large groups perceive/frame a particular issue. The SW CSC might use this technique to learn, for example, how ranchers or native tribes in the southwest think about climate change. The goal is to enable scientists to connect better with how people are actually thinking vs trying to change their mind. What stories or narratives can go viral in different social communities?

2019 **Boundary Organizations Effective in Helping Society Ramp Up to Climate Challenge** 12
SWC1

There is a daunting chasm between climate research results and the real-world implications for those who have to act based on it. Boundary organizations take on the challenging task of managing the science-policy boundary. Typical tasks include convening parties for face-to-face contact; translation between the scientists and the stakeholders; facilitating knowledge co-production, and mediation. Studies have proven that the use of boundary organizations is one of the quickest ways to build & implement realistic, science-based adaptation strategies. Think of them as extension services for climate adaptation.

Event Listing

Year	Event Text	Card # MasterID

Frontline Managers

2015 **Survey Indicates Federal Land Managers Are Not Following Literature on CC and Adaptation** 13 SWC9

Driven by day-to-day crises, by directives from above, scrambling for resources, impacted by personnel turnover -- the last thing most federal land managers have time for is to stay up to date on the newest literature on climate change and adaptation.

2017 **County Offices Are Key to Reaching People on the Ground** 14 SWC8

County offices are where the real stakeholders come together. Their meetings have a mix of private land owners, ranchers grazing on public lands, state land management people, BLM, other water managers, etc.

2017 **Resource Managers Flock to Science/Adaptation Sessions** 15 SWC9

There is broad interest in learning more about climate change adaptation by resource managers of all kinds and all levels – federal, state, local, NGO, private. Scientific findings and applied science seminars given by the LCCs and CSCs are heavily attended. Attendance tends to be even higher when educational and science sharing sessions are taken out for "road shows" – allowing managers to attend without having to travel for more than an hour or two.

2017 **Scenarios Begin to be Used to Screen Specific Resource Manager Decisions** 16 SWC1

As comfort with scenario thinking has developed, it now is common practice to screen, or 'wind tunnel' test, alternative decisions against a widely understood set of scenarios. Sometimes managers want to make 'no regrets' decisions. In other situations, riskier decisions are considered fine so long as risks are understood and tracked so changes can be made before failures.

2018 **Post-Project Assessment of 3 SW CSC Projects Indicate Resource Managers Not Using the Tools** 17 SWC1

Every research project wants to show its impact on resource manager decision making, so it develops a specific tool to aid in this process. The average resource manager has to juggle several tools to get the guidance he needs. The tools are not integrated, have varying user interfaces, and ask for data in different ways. Some tools were developed without consulting with resource managers. The result: a lot of tools just aren't used.

Event Listing

Year	Event Text	Card # MasterID
2019	**DoI Land Managers Unable to Implement SW CSC Findings**	18 SWC1
	Despite clear understanding of what needs to be done and how practices need to change, DoI resource managers are making very few, if any, changes to their strategy or practice. It's not so much individual manager reluctance as it is the bureaucracy they are mired in - overworked, understaffed, entangled by pre-existing rules and regulations, siloed by agency, beset by political pressure to focus short-term and not to do anything controversial. Knowing what to do, and how to get it done, are two different problems.	
2020	**DOI Rewards 25 Resource Managers for Best Adaptation Planning**	19 SWC9
	Rather than managing to static goals in static ecosystems, resource managers have been continually evaluating what the evolution/step-changes in the ecosystem will be, and reset their goals appropriately. They often gave up on traditional goals as not possible, and frequently come up with new goals that weren't feasible before. The Secretary of the Interior rewards 25 of the "best" resource managers for their creative and visionary adaptation planning.	
2020	**65% of SW DOI Management Units have Climate Change Adaptation Plan**	20 SWC9
	65% of DOI management units in the southwest have a plan (of some sort) in place for dealing with the impact of climate change. Help was abundant – federal and state agencies, universities, NGOs, and foundations all played a role.	
	LCCs	
2016	**CSC HQ Promotes the Value of LCCs**	21 SWC1
	The LCCs' close engagement with stakeholders of all types and their focus on outreach and training makes them ideal partners for the CSCs – both in helping shape the science initially, and in ensuring the eventual use of the science. The CSCs and LCCs have documented several case studies highlighting the synergies. NCCWSC does what it can to ensure that LCC funding will continue and possibly increase.	

Event Listing

Year	Event Text	Card # MasterID
2016	**LCCs Leverage $2 in Partner Money for Every $1 of LCC Spending**	22 SWC1

The LCC's have become very entrepreneurial. Even though the LCC budgets are flat, the number of applied research and demo projects continues to expand. This happens as the LCCs become ever more effective at collecting and connecting partners. A $1 investment from the LCC might gather $1 in matching funds from the states, and another $1 from BLM.

2016	**CSCs Pull Together All LCCs in their Region**	23 SWC2

Most CSCs work with multiple LCCs, and vice versa. Several CSCs now bring together all the LCCs working with them to coordinate projects and ensure full coverage of needs while minimizing overlap.

2016	**CSC Supported Survey Indicates that Most Stakeholders Prefer to Deal Only with the LCCs**	24 SWC2

The results of this survey were a surprise to the CSC, but when it comes down to it, the stakeholders don't have time to work with multiple DOI organizations. Most prefer to work with the LCCs and let the LCCs represent them to the CSCs.

2016	**CSCs Fund LCCs to Distribute Findings**	25 SWC1

The LCCs have a much broader range of manager contacts than the CSC does, and are expert at applied science. In areas with strong LCC capacity, the CSCs prefer to hand off much of the responsibility for sharing the results of research to the LCC – while still providing support from the scientists when and where needed.

SW Climate Orgs

2016	**CSC and LCC Conduct Joint Strategy Sessions on Research Agendas**	26 SWC8

The purpose of these strategy meetings are to jointly develop research agendas, and identify who owns which projects. Other orgs, like RISAs, USDA Hubs, etc are often included as well.

Event Listing

Year	Event Text	Card # MasterID
2018	**DOI Welcomes Integrated Climate Change Plan from Southwest**	27 SWC7

The various federal agencies in the southwest (CSC, LCC, Hubs, RISAs, etc), along with partners from the states, and NGOs, have produced an integrated climate adaptation research, demonstration, and implementation plan. This is gratefully accepted by HQ – if everyone agrees, who are they to argue? They just get in front of the parade and pretend to lead it. Congress is pleased.

2019 **CSC/LCC Attrition Disrupts Many Projects** 28 SWC8

Everyone agrees that the work of the LCCs and CSCs is very important, and that they are doing a good job at it. But the demand is so high, and resources are so scarce, that many CSC/LCC staff and PIs are leaving their positions because of burnout and family issues. It is a common enough occurrence that many important projects are falling way behind, and many important social networks are unravelling.

Science

2016 **Researchers Report Benefit from Review of Applications of their Work** 29 SWC2

The researchers report benefit when they see in practical terms how their results are getting applied. In the past, they just published and didn't really know what was done with the data. Seeing multiple and different ways their work is used gives them insight into better research design in future projects and better ways to package results for easier applicability. Also, it is inspiring to know that what they did had real world utility. Funders will want to know this, too. At times researchers learn that their work is being misapplied and these reviews help to spot that too.

2016 **Adaptation Decisions Often Have Undesirable Mitigation Implications** 30 SWC3

What's good for adaptation can be bad for mitigation, and vice versa. For example, a state eager to grab onto the construction jobs and energy supply of a new massive solar site doesn't bother coordinating with the federal and nearby state resource managers. Or, decisions of resource managers for adaptation have mitigation implications, usually in terms of changes to the carbon storage capability of a landscape.

Future Scenarios for the USGS
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Year	Event Text	Card # MasterID
2016	**Half of All Climate Science Papers from US Authors are Uncited**	31
		SWC3
	NYTimes science journalist reports that half of all climate science papers from US authors are uncited. There is a lot of research out there that even other researchers aren't looking at.	
2017	**Ecosystem Model Fails, Causing Species Collapse**	32
		SWC3
	A major investment was made a decade ago to build a comprehensive model of a species response to climate change. The model provided precise descriptions of where species populations were likely to fail in the future, and where they were likely to be viable. Managers and planners made critical decisions based on results of the model. Unfortunately the model failed to take into account a critical factor, and managers and scientists alike were blindsided when populations collapsed across the range.	
2017	**Co-Production Solves the Problem of Long Waits for Research Results**	33
		SWC1
	Scientists partnered with invested stakeholders helps the stakeholders to understand research implications along the way. Co-production keeps resource managers in the loop much more frequently than waiting for publication in a journal, a process that can take more than a year. Managers can now take actions a year or two earlier than they could in the past.	
2017	**Detailed Sub-Region-Specific Climate Models have Higher Accuracy**	34
		SWC4
	A report from the National Research Council concludes that geographically limited models are able to capture more processes that matter in that environment than the traditional global models. For example, the ability to capture the effect that dust has on the melting of snowpack and the expected levels of dust in that region due to human activity. Other processes that drive precipitation are also often more localized in nature and need to be modeled on a sub-region specific basis to be accurate.	

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Event Listing

Year	Event Text	Card # MasterID
2017	**Review Shows Many Possible Approaches to Co-Production**	35
		SWC3
	Many techniques are available to perform co-production. A recent CSC funded study found five distinct approaches. The commitment of time for stakeholders and researchers varied by technique. Social science perspectives were often as important as the hard science. Co-production is far more diverse than just scientist and managers working together throughout the lifecycle of a project.	
2017	**Rethink of Conservation Strategy Tenets Underway at Many Organizations**	36
		SWC3
	Basic tenets of conservation science are up for discussion as a result of climate change. Are there some ecosystems that simply cannot be restored? When does it make sense to give up on trying to preserve an endangered species? Are there times when it is appropriate to encourage novel ecosystems? Questions like these have many conservation organizations rethinking their strategy, at times acrimoniously.	
2018	**5yr Seasonal Climate Forecasting Becoming Reliable**	37
		SWC3
	Climate variability is the core problem for resource managers in the near-in time frames. New research has resulted in better insights into seasonal climate variability over the next 5 years. It is now possible to forecast unusually wet, dry, hot, or cold seasons, particularly summers and winters, 3 to 5 years in advance. This forecasting ability is enormously helpful to land managers and planners.	
2019	**Universities Increasingly Incentivize Applied Research, Field Impact, and Stakeholder Engagement**	38
		SWC2
	Universities develop incentives for doing applied research and doing the extra work to make findings usable and understood by practitioners. No longer are basic research and publishing the only things you can be rewarded, tenured, and promoted for.	
2020	**SW Water Research Additionally Focuses on Flood Events**	39
		SWC3
	The focus of a lot of research has traditionally been on future water supplies. Following recent disturbances, there is now interest to understand future possibilities for extreme flood events in the SW. The result is less interest in the snowpack and more in extreme rain events, which are harder to predict. Land use questions come up as well.	

Event Listing

Year	Event Text	Card # MasterID

National CSC Issues

2016 **Coordinated National CSC Plans by HQ Divert Regional CSC Goals** 40
SWC4

As the national CSC leadership attempts to coordinate the activities of individual CSCs to pursue nationwide adaptation goals, some local CSC priorities are postponed to free up resources.

2016 **One CSC Builds Best Practices Database, Other CSCs Ignore It** 41
SWC6

Getting the CSCs to really use each other's results is harder than you might think. There's no glory in adopting someone else's approach.

2017 **USGS Simplifies Project Funding Rules for CSCs** 42
SWC5

Too much of CSC staff time has been spent on following the byzantine rules for CSC project funding and grant restrictions – far more complex and restrictive than equivalent funding processes elsewhere. After several frustrating years, the process has finally become more streamlined.

2017 **CSCs Allowed to Use 25% of Funding "Out of Network"** 43
SWC1

Science funding is no longer strictly limited to CSC member institutions. There are times when the needed expertise is simply not available in-house. Rules have been loosened to allow the CSCs to spend up to 25% of their funding outside their home organizations.

2019 **DOI Funding is Skewed Toward Regions with Most Federal Lands** 44
SWC3

To get the most benefit from its research dollars, the DOI prioritizes funding for those centers with the greatest amount of federal land. Spending becomes more proportional to the actual size of federal lands in each region. For example, the southwest contains 25% of all federal lands.

Event Listing

Year	Event Text	Card # MasterID

National CSC Strategy

2016 **CSCs Establish Standard Climate Scenarios to Use in Vulnerability Assessments** 45 SWC1

At present, stakeholders have no guidance on which climate scenarios to use in doing vulnerability assessment. They chose to rely on the CSCs for providing the subset of models that is preferred for this kind of work in each region. They want to know what are the likely scenarios and then build plans based on those, without new model work. As more research is done and real measurements build up, the scenarios are refined.

2016 **CSCs Kick-Off Program for Common Framework for CC Indicators, Protocols, and Monitoring** 46 SWC1

Every agency and sub-department seems to have its own approach to the data it collects, and how it stores them. Besides the drain of continually re-inventing the wheel, these divergent approaches mean that data sharing is nearly impossible. The CSCs kick off a program to bring some order to this chaos. It will also require agencies to share once-siloed, inaccessible data sets. The goal is for something light-weight and adaptable – not a monstrous centralized colossus.

2016 **CSC Project Funding Now Includes Time and Resources for Periodic Meetings with Stakeholders** 47 SWC1

It is now considered mandatory to meet regularly with stakeholders to review a project and course correct as needed. Time near the end of the project is devoted to interpretation of results and further refinement to make it more useful.

2016 **CSC Funding Increases Opportunistically** 48 SWC7

When constituents yell, Congress listens and appropriates. Much of the increase in CSC funding over the last couple of years has come from specific “crisis” situations – the drought, Arctic permafrost melting, strong El Nino, a huge fire. It’s hard to plan ahead in these cases – more important is agility and the ability to quickly develop and deploy new research.

2017 **CSCs Develop Cadre of Science Translators to Facilitate Discussion between Scientists and Practitioners** 49 SWC1

Science translation is a unique skill set and role that is developed as part of the CSC mission. This new, capable group of science translators helps to facilitate discussions between the scientists and the practitioners. They also translate research concepts into something managers can use.

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Event Listing

Year	Event Text	Card # MasterID
2017	**CSC Drought Project Hugely Successful in Eyes of Resource Managers**	50 SWC8
	The major project on drought, which involved 3 CSCs, has gone well and has really engaged the many resource managers in regions involved.	
2017	**CSC Network Policy Requires All Research to Have Explicit Management Need**	51 SWC5
	In a new round of CSC funding, NCCWSC begins to require that all funded projects begin with a description of the explicit and specific management need that calls for the science work, and describe the partnership with management agency.	
2018	**CSCs Develop Closer Working Relationship with Strategic NGOs and Climate-Focused Foundations**	52 SWC1
	The NGOs have content expertise and on-the-ground relationships in both the field and in government that are good complements to the CSC mission. The CSCs have developed cordial relationships with a number of NGOs and also environmental foundations where they can seek funding for very specific, important needs that the government can't or won't fund.	
2018	**CSCs Sponsor "Best Co-Production Project" Awards**	53 SWC5
	Each CSC yearly selects the top-performing co-production project within its purview. The winners get the prestige of the award (as well as a funding boost); the "best practices" gleaned from these winners are combined to create an advice packet for future projects.	
2018	**CSCs Forges Closer Relationship with USGS**	54 SWC5
	Even though they are part of the same agency, the CSCs have tended to be run quite independently from their parent organization. Climate change is having a huge impact on its areas of research. CSCs have been directed to support their regional USGS as strongly as they support the regional LCCs.	

Event Listing

Year	Event Text	Card # MasterID
2018	**Diverse CSCs Nonetheless Offer a Set of Uniform, Unique Services**	55 SWC5
	In general, the CSCs have divergent agendas, appropriate for their particular region. However, there are a couple of areas where they have all become the unique, go-to source for information across domains and jurisdictions. For example, a library of the ecologically relevant regional climate variables and models. Or an encyclopedia of everything known about regional species adaptive capacity. This important and unique offering wins them advocates when funding decisions roll around.	

Federal Policy

2017	**Annual Budget Cycles Undermine Planning for Climate Adaptation and Resilience**	56 SWC6
	The planning cycle of land managers is being highly impacted by the yearly swing in directives and vagaries of congressional funding. Long-term plans funded one year may be defunded two years later due to budget cuts or redirection of priorities.	
2017	**New Congress Increases Funding for Environmental Monitoring**	57 SWC7
	Continued monitoring of changes in habitat and species is now something that is considered a fundamental part of becoming better adapted to increasing climate variability, and therefore receives increased funding. Monitoring programs that explicitly support the evaluation of the efficacy of implemented adaptation options are rewarded with even more funding.	
2017	**Congress Eliminates the LCCs**	58 SWC2
	Support had been shaky for a while and finally Congress decided to pull all funding and support.	
2018	**Congress Supports Strategic Step-up in Funding for Climate Change Organizations**	59 SWC5
	The real world impacts of climate change have become more evident and the political winds have changed. CSCs, along with other federal climate change organizations, have received a significant increase in their annual funding.	

Event Listing

Year	Event Text	Card # MasterID
2020	**FWS Issues Directive on Interpreting ESA in the Face of Multiple Stressors and Reduced Resources** The Fish and Wildlife Service, as the overseer of the Endangered Species Act, has issued a major policy statement that recognizes diminishing capacity to save every species under CC and other stressors. The FWS has formally adopted a *triage* approach: minimal resources are allocated to species / populations judged 'beyond all hope', and concentrates its management and enforcement towards species that have reasonable expectation of viability under a changing climate. This policy is highly controversial.	60 SWC8
2020	**Coastal Impacts from Coastal Storms in Southern California Lead to Increase Federal Funding for Sea Level Rise Adaptation, Hurting CSC Funding** Impacts from sea level rise and storms become a major public concern following storm events. Some CSC funding is diverted into other agencies to address the needs.	61 SWC6

End of **External**

Event Listing

Year	Event Text	Card # MasterID

Internal

SW CSC Strategy & Operations

2016 **Consortium PIs & SW CSC Agree on Shared Vision, Strategy, Objectives** 62
SWC1

Through a series of facilitated meetings, the PI's and CSC agree on shared vision going forward - in areas of both content and process.

2017 **SW CSC Establishes Impact Metrics and Evaluation Process** 63
SWC1

The SW CSC now attaches impact metrics to the projects it funds. After the project is complete, three to five year follow-up analysis tracks whether any managers are using the findings in their decision making or putting the results into day-to-day practice. The metrics are used to improve proposal scoring and to share best practices. With these metrics established up front, the research design is better tailored for real impact.

2018 **SW CSC Completes Overview of All Climate Projects in Region** 64
SWC1

The SW CSC has pulled together descriptions of the scope, method and target constituency for all projects funded by any group in its region. This way it knows where there is work already being done and can avoid funding a project that is close to one already funded. Also, the gaps become more apparent with this data in hand. Implicit in this is an overview of the various organizations in the region and their relationship to each other. Describing this intricate set of relationships and the work being done by each was viewed by all as highly valuable.

2018 **SW CSC Holds Regular Joint Stakeholder/Scientist Workshop** 65
SWC1

A professionally-facilitated workshop sets up a rich dialog between stakeholders and university scientists, help them jointly decide what is the most important science needed over the coming years – broad enough to be more generally applicable, and specific enough to help a real manager with a real problem.

Event Listing

Year	Event Text	Card # MasterID
2018	**SW CSC Acts as Resource Leveler**	66 SWC1
	The SW CSC has acted as a “resource leveler” over the past few years, attempting to compensate for budget vagaries across agencies by ensuring important work continues when a particular source of funding is cut off, e.g., orphaned monitoring programs, key research, student trainings, outreach & education, etc.	

Research Partnerships

2015	**SW CSC Science Review Committee Holds Biennial Face-to-Face Meetings**	67 SWC1
	Though they work effectively via con calls, there is no substitution for in-person interaction and relationship building. The committee has decided to hold a two-day meeting every other year, with the option of a third day to tour one of the project sites they have funded.	
2016	**SW CSC and CCASS Develop Strong Partnership on Co-Production**	68 SWC1
	CCASS (Center for Climate Adaptation Science and Solutions at UA) has turned out to be a key partner for the SW CSC. Their objective of creating a unified approach to adaptation work being done at UA dovetailed nicely with the CSC’s objectives. Since the CSC has money and CCASS doesn’t have much, there was a good basis for working together. One key area of joint effort is in co-production.	
2016	**BLM, Forest Service, BoR Become Active Partners with SW CSC**	69 SWC1
	The Bureau of Reclamation, the Bureau of Land Management, and the USDA Forest Service are now actively involved in co-production. The SW CSC is the convener. Previously, these agencies had been less directly involved.	
2017	**SW CSC Funds Significant Social Science Research**	70 SWC7
	Understanding the 'people angle' is just as important as understanding the science. What is the best way to improve resource manager decision making? How do disparate groups best coordinate their efforts on climate change? What's the best way to get resource managers and scientists working together? Answering these questions in a focus area for the SW CSC.	

Event Listing

Year	Event Text	Card # MasterID
2018	**SW CSC Expands the University Consortium**	71 SWC1
	SW CSC seeks to add members to the primary university consortium both for expertise and connection to critical stakeholders, e.g., a Mexican University or Tribal College; a university in Utah, another campus in the Arizona or UC system.	
2019	**Ecologists Dominate Core PI Team, More Than Physical Scientists**	72 SWC1
	Understanding the impact of changes in climate requires a better understanding of how ecosystems function and respond to climate change, not just the hydro-climatic attributes of particular geographies. The Core PI team now has more ecologists than physical scientists.	

SW CSC Partnerships

2015	**SW CSC Supports Southern Rockies LCC "Connections Workshops"**	73 SWC1
	Over the course of several months, the Southern Rockies LCC plans to visit each of its three focus landscapes, and present the results of its work to-date, and get input on future needs. The SW CSC has arranged for a scientist to attend each of these meetings – to provide more in-depth expertise, and to listen to the needs of the managers.	
2016	**SW CSC Hosts Annual Climate Workshops for Stakeholders**	74 SWC1
	The CSC hosts an annual event aimed at having a shared conversation about research needs. The focus is to get as many practitioners as possible to attend. It is structured to include small group conversations about what's needed, what's possible, what's already happening, what needs to be added to the research, etc.	
2016	**SW LCCs and SW CSC Clarify Responsibilities**	75 SWC1
	Each of the five SW LCCs work with the SW CSC to delineate distinct responsibilities and spheres of activity, ultimately signing a memorandum of understanding. Originally created for different purposes, they have drifted into similar territory. They now define more clearly each organization's key mission and scope.	

Event Listing

Year	Event Text	Card # MasterID
2016	**SW CSC Partners with Regional Forest Managers**	76 SWC1
	The regional managers are the ones that can direct resources at a broad level – both directly through re-assignment, but more powerfully through letting everyone know that climate change adaptation is a priority and so is partnering with the SW CSC and similar organizations.	
2016	**SW CSC Connects to Existing Outreach Groups, Avoids Building Their Own**	77 SWC1
	The SW CSC takes advantage of organizations with existing outreach programs. The Extension programs of the land grant universities are generally the oldest. The LCCs have also developed outreach and put a lot of effort into it. Some PIs have long standing relationships with land managers. The CSC approach is to leverage the existing relationships of these people and organizations, not try to re-create them.	
2017	**SW CSC and WUCA Partner on Water Research**	78 SWC7
	The SW CSC has partnered with the Water Utility Climate Alliance members in the southwest. The goal is an integrated view of SW water as a system. Water demands for drinking, the environment, agriculture, and other needs are too often examined in a siloed fashion. Sources of water are also often studied at in silos - ground water, surface water, recycled water, precipitation, evaporation. This partnership helps provide science-based support for decision making.	
2017	**SW CSC is "At the Table" When Stakeholders Do Their Planning**	79 SWC7
	True co-production requires a deep and ongoing relationship with the resource managers. The SW CSC has made it a practice to attend important planning meetings for its major regional stakeholders - LCCs, NPS, FS, BoR, etc. This allows the CSC to deeply understand the issues the managers face, influence their plans and to be more cognizant of their climate change adaptation issues.	
2018	**SW CSC Partners with NCEAS to Establish Climate War Room**	80 SWC1
	The SW CSC in partnership with NCEAS (National Center for Ecological Analysis and Synthesis at UCSB) has built a facility where stakeholders can come and interact in a variety of ways with climate science information, models, scenarios, etc. The facility includes state-of-the-art visualization technology to facilitate discussion of model results, data syntheses, and imagery.	

Event Listing

Year	Event Text	Card # MasterID
2018	**CSCs and LCCs Prioritize Tribal Integration into Regional Water Initiatives**	81 SWC8

You can't manage water and biota in the SW without Native American tribes at the table - they manage a major portion of the southwest land and water resources. They also operate as sovereign nations in many respects - without their cooperation and buy-in, critical projects can be stymied. Most tribes have not yet put effort into dealing with climate change impact on water, so capacity building is critical.

SW CSC Focus Areas

2015 **SW CSC De-focuses Investments on Downscaling** 82 SWC1

In the first place, the downscaled models just have too much uncertainty in them to really rely on. Additionally, most of the problems that land managers deal with are in the shorter term and pretty obvious. Besides, the science component is often just a small component of dealing with the problem – it's as much or more about regulations, partnerships, awareness, and so forth.

2016 **SW CSC Focuses on Approaches to Dealing with Uncertainty** 83 SWC1

The SW CSC has identified a big need in the stakeholder community and has decided to focus on it. They want to understand and categorize the main sources of uncertainty in climate change forecasting. When managers are confronted with significantly different results from different models they throw up their hands. The CSC is attempting to provide them with a way of understanding the uncertainty inherent in these forecasts and how to make decisions despite that.

2016 **SW CSC Focuses on Climate Model Harmonization** 84 SWC1

There are way too many climate models being used across research and management in the southwest. The CSC performs an inventory of all the models in use, then gathers together relevant parties to find a way to streamline the number of models, and improve those that remain. No one is forced to use a particular model; but many welcome handing of model management to someone with more time and experience.

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Event Listing

Year	Event Text	Card # MasterID
2016	**SW CSC Focuses on How to Assist the Development of New Ecosystems In the Wake of Large Disturbances** With increased awareness that large scale disturbances are coming, the SW CSC gets involved in answering questions such as: how do we assist the ecosystem that comes next? How do we know what can successfully migrate to the disturbed area? What species need assistance moving into it and what species will be fine on their own?	85 SWC1
2017	**SW CSC Supplies Managers with Parameters of Extreme Planning Outcomes** Rather than the “most likely” outcome, the SW CSC has been supplying managers with possible extremes that they should include in their profile. What is the chance of a 15 year or longer megadrought? Of the increased frequency of 3x higher storm flow? Managers test their plans against these extremes (not just the “most likely case") as an additional form of risk management.	86 SWC1
2017	**SW CSC Focuses on a Few Large Interdisciplinary Projects** The SW CSC chooses to focus on a few, difficult interdisciplinary projects, e.g. understanding ecosystem transformation paths.	87 SWC9
2017	**SW CSC Translators/ Applied Scientists Respond to Crisis Needs with Action, Not Research** When a new crisis hits, the CSCs are often called upon to help out. They have determined that the best approach is NOT to undertake new science immediately. Rather, they need applied scientists who can pull the relevant existing science to inform the best possible response and recovery trajectory. After the initial crisis is dealt with, a post-project review often reveals the need for important, long-term research projects based on what was learned from the crisis.	88 SWC8
2019	**SW CSC Provides Integrated Precipitation Model** The model provides increased information of how precipitation is likely to change in the coming decades, including magnitude, phase, and timing. It isn't a prediction, but it does offer ranges of scenarios to consider, and it is continually updated with the latest scientific findings.	89 SWC8

Event Listing

Year	Event Text	Card # MasterID

SW CSC Co-Production

SW CSC University Consortium Develops Network-Wide Co-Production Progam 90
SWC9

The SWCSC university consortium has developed a network-wide program to train graduate students in co-production and decision tools. Graduate students interested in or committed to careers at the research/management boundary will receive training and certification in delivering impactful science to resource management decision makers. With SWCSC coordination, the participating universities leverage their resources and experience across the network.

2015 **SW CSC Selected for Pilot Project on Co-Production** 91
SWC1

Co-production is much more resource intensive than typical research projects. Few scientists or land managers know how to even approach the issue. The SW CSC has been selected for a HQ pilot grant to run a project using a true co-production methodology.

2016 **Project Leaders Work with Practitioners on Data Standards** 92
SWC3

It is now common practice for a new SW CSC project to have the PI sit down with the practitioners who will use the work to standardize key data structures, formats and scales. The goal is to insure that the results line up with systems in a practitioner office. In the past when a project delivered a result, it was sometimes the case that the practitioner couldn't really use it. Wrong scale. Wrong GIS. A little extra effort upfront greatly increases the value of the results.

2016 **CSC Network Sponsors Regional Workshops on Co-Production Techniques** 93
SWC9

The workshop is run by and for those who are doing co-production and science translation in the field. It is an opportunity to learn from each other, and to create a best practices guidebook. Both scientists and resource managers attend, as well as experts in the field.

2017 **SW CSC Offers Short Course for Scientists on Engaging with Practitioners** 94
SWC1

For scientists wanting to do a better job of this, the SW CSC now offers training on techniques and processes for better dialogue and project design. Included are ways to talk about challenges rather than directly about climate change.

Event Listing

Year	Event Text	Card # MasterID

SW CSC Projects

2015 **SW CSC Creates Federal Agency 101 Webinar for Researchers** 95 SWC7

The webinar explains what each Federal agency (FS, FWS, RISA, BLM, USBR, etc.) is responsible for, what kinds of funding it might have, what its limitations are, etc. You have to understand how the money works in these different agencies. For example, it's important how a project is described. Also, there often are end of year funds that can't be carried over and must be obligated on short notice. All researchers working with the CSCs and LCCs are required to absorb the material so that they can at least talk intelligently with a resource manager.

2016 **SW CSC Builds Regional Social Network and Online Community for SW Climate Adaptation** 96 SWC1

The SW CSC was large enough of an entity to bring the coordination needed to develop a robust social network. The online community is active, and people use it to stay up-to-date on the many efforts in the region. Managers have the ability to post questions, and others in the network respond.

2017 **SW CSC Provides Scenario Training to LCCs and Others** 97 SWC1

The uncertainty of climate change makes scenario-based planning a natural approach. Many are using it already, though without any formal training. The SW CSC has developed a toolkit of scenario-based approaches complete with tailorable data. It provides training on how to use the tools, and will help select the right approach and the best data sets for a particular project.

2017 **SW CSC Performs Climate Change Readiness Assessment** 98 SWC1

Upon request, the SW CSC will review existing management plans across an ecosystem, providing feedback, analysis and recommendations. Often, the results yield the need for specific science projects, personnel training, cross-jurisdictional coordination, re-writing of long term plans, or development of contingency plans.

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Event Listing

Year	Event Text	Card # MasterID
2017	**SW CSC Creates Decision Support Tool in Partnership with LCCs**	99 SWC1
	A decision support tool which helps determine the minimum standards, and specific types and resolution of climate information needed in specific regulatory documents (Biological Opinions, Habitat Conservation Plans [HCPs], Candidate Conservation Agreements, NEPA docs, and Resource Management Plans and Forest Plans). Something similar at BR for rivers. The key idea is that more information does not make a better decision, only the right information correctly contextualized and applied.	
2017	**SW CSC Completes Study of Decision Making among its Stakeholders**	100 SWC2
	SW CSC completes a comprehensive look at the kinds of decisions resource managers need to make. Who makes them and how? What are the real decisions and situations they face? A set of categories are developed that characterize different aspects of a decision (geographic scope, timeframe, interactions with other resource managers, risk profile, etc.). The goal is to understand how to bundle needs and projects in a way that is applicable to more than one decision of the same type.	
2018	**SW CSC Self-Funds Outreach Program to Meet Demand**	101 SWC1
	Federal resource managers, state forests, state fish and wildlife agencies, water resource managers and more are clamoring for information and education that will help them understand how they should respond to climate change. Without adequate federal funding to meet this demand, the SW CSC now charges a recovery fee for the cost of its services - it hosts a large outreach program to supply science translators, technology transfer experts, and applied scientists that are primarily funded by the fees it charges.	
2018	**SW CSC Convenes Cross-Jurisdictional Meetings to Address Boundary-Crossing Adaptation Issues**	102 SWC1
	Climate adaptation work often crosses organizational, governmental, sectoral, and disciplinary boundaries. Everyone is responsible for a piece of the problem and of the solution, but no one is tasked with addressing the problem holistically. Choices that make perfect sense in one context are devastating from another. The SW CSC often oversees the process to resolve these complex issues, bringing together all stake holders, as well as the data and the process required to make difficult tradeoffs and decisions.	

Event Listing

Year	Event Text	Card # MasterID

SW CSC Staffing

2016 **SW CSC Hires Science Translators** 103 SWC1

Rather than working only with research scientists, the SW CSC has hired two expert "science translators". These people are the bridge between researchers and stakeholders, helping each to communicate effectively and identify their respective needs.

2016 **SW CSC Hires Applied Climate Scientist** 104 SWC1

Land managers have many smaller science needs; often they just need someone to help them sort through existing literature, or advise them on how to run simple experiments. The new staff scientist is available for these smaller requests.

2017 **SW CSC Sets Up Rotation Program for Specific Needs** 105 SWC1

The SW CSC now has a program where an agency employee can be rotated into the CSC for a specific length of time (say, 3 months to 6 months) to work on a particular project (say, setting up a new monitoring approach with a PI). This has several advantages – it provides more staff support for the CSC, it supports the concept of co-production, and it builds tighter links out to field organizations.

2017 **SW CSC Targets Young Researchers for Co-Production** 106 SWC1

Young researchers tend to have more interest in directly applying science, and are not yet on the publish-or-perish treadmill. This makes them ideal candidates for work involving science translation, applied research, and science co-production. These students are headed into the growing market for applied science jobs in the government and private sector. The SW CSC takes full advantage of this when it decides its funding/hiring strategy.

2018 **SW CSC Hosts Interns from Tribal Colleges** 107 SWC1

The SW CSC has built a relationship with the technical tribal colleges in the southwest, regularly co-sponsoring internships for students at these institutions on CSC-funded projects.

Event Listing

Year	Event Text	Card # MasterID

External Communications

2016 **SW CSC Develops, Funds, Prioritizes Full Communications Plan** 108 SWC2

Research isn't very useful if no one knows about it. The SW CSC has developed press plans, an expanded website, a series of outreach webinars, a newsletter, a speaker's bureau, case studies of science being applied, and a traveling road show. Research project leaders make support of the communications plan a priority. Everyone from Congress on down wants to know about what's going on.

2017 **Public Education Events Held by the SW CSC Draw Powerful and Connected People** 109 SWC2

The SW CSC sponsored public events draw powerful and connected people into thinking about what climate change will mean to the region in various ways: water, wildlife, food, fires, etc. The attendees, often recruited by special invitation, are capable of leading change on a social scale for issues that have 10-30 yr, multigenerational, time frames.

2017 **The SW CSC Creates Standard Set of Climate 101 Presentations for Stakeholders & Partners to Use** 110 SWC1

As interest in climate change adaptation increases, towns,cities, counties, state agencies all need to get up to speed. The SW CSC has put together set presentation on the most commonly requested topics, that can be used by regional/local presenters and that contain the latest insights. They also provide periodic webinars on these same topics.

2017 **SW CSC Provides Science-Backed "Talking Points" for Big Climate Stories** 111 SWC1

When a big climate-related event occurs - an unexpected deluge, a scary scientific paper, a controversial newspaper editorial - the SW CSC quickly assembles the relevant facts and science to promote an accurate understanding of the issue. This is of great help to resource managers, who find themselves pulled into firedrills and answering media queries without having the knowledge at hand. It also gets the CSC positive local press.

End of **Internal**

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Current Expectations Summary

HU%	UN%	HL%	Cer%	HU	HL	Card#	Year	Event Text
# of Records: 61				Total Highly Likely: 18		30%		Total Highly UnLikely: 6	10%
External				Total Highly Likely: 18				Total Highly UnLikely: 6	
Southwest Climate								
33	12	55	22			1	2017	Studies Show that Most CA Trees Will Be Out of Favored Climate at Century's End
9	48	42	33			2	2018	A Review Paper in *Science* Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes
3	3	94	91		Y	3	2018	It's Just One Damned Thing After Another Out There In The Real World
33	45	21	-12			4	2018	US Food Prices Increase Sharply
12	9	79	67		Y	5	2018	Strong El Nino Brings Back Bad Old Habits
24	64	12	-12			6	2019	Central Arizona Project Water Allocation Cut by 40%
12	52	36	24			7	2019	Lake Mead Hits 1024', Colorado River Compact Open to Discussion
	15	85	85		Y	8	2020	Massive Forest Dieback Across the SW Drives Managers to Triage Priorities
Stakeholder Needs								
30	36	33	3			9	2017	Support for Government Action on Climate Change Reaches 75% of General Population in Southwest
58	30	12	-46			10	2017	Recalcitrant State Governments Now Seek Help on Climate Adaptation
12	64	24	12			11	2018	Development of Narratives Using Analytics Develops Strong Connections to Stakeholders
6	12	82	76		Y	12	2019	Boundary Organizations Effective in Helping Society Ramp Up to Climate Challenge

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Current Expectations Summary

HU%	UN%	HL%	Cer%	HU	HL	Card#	Year	Event Text
Frontline Managers								
	21	79	79		Y	13	2015	Survey Indicates Federal Land Managers Are Not Following Literature on CC and Adaptation
24	30	45	21			14	2017	County Offices Are Key to Reaching People on the Ground
9	30	61	52		Y	15	2017	Resource Managers Flock to Science/Adaptation Sessions
9	6	85	76		Y	16	2017	Scenarios Begin to be Used to Screen Specific Resource Manager Decisions
	48	52	52		Y	17	2018	Post-Project Assessment of 3 SW CSC Projects Indicate Resource Managers Not Using the Tools
6	45	48	42			18	2019	DoI Land Managers Unable to Implement SW CSC Findings
3	27	70	67		Y	19	2020	DOI Rewards 25 Resource Managers for Best Adaptation Planning
9		91	82		Y	20	2020	65% of SW DOI Management Units have Climate Change Adaptation Plan
LCCs								
	39	61	61		Y	21	2016	CSC HQ Promotes the Value of LCCs
15	36	48	33			22	2016	LCCs Leverage $2 in Partner Money for Every $1 of LCC Spending
18	30	52	34			23	2016	CSCs Pull Together All LCCs in their Region
67	33		-67	Y		24	2016	CSC Supported Survey Indicates that Most Stakeholders Prefer to Deal Only with the LCCs
45	30	24	-21			25	2016	CSCs Fund LCCs to Distribute Findings
SW Climate Orgs								
12	27	61	49			26	2016	CSC and LCC Conduct Joint Strategy Sessions on Research Agendas
42	45	12	-30			27	2018	DOI Welcomes Integrated Climate Change Plan from Southwest
36	42	21	-15			28	2019	CSC/LCC Attrition Disrupts Many Projects

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Current Expectations Summary

HU%	UN%	HL%	Cer%	HU	HL	Card#	Year	Event Text
Science								
9	15	76	67		Y	29	2016	Researchers Report Benefit from Review of Applications of their Work
9	27	64	55		Y	30	2016	Adaptation Decisions Often Have Undesirable Mitigation Implications
39	39	21	-18			31	2016	Half of All Climate Science Papers from US Authors are Uncited
64	30	6	-58	Y		32	2017	Ecosystem Model Fails, Causing Species Collapse
36	33	30	-6			33	2017	Co-Production Solves the Problem of Long Waits for Research Results
21	24	55	34			34	2017	Detailed Sub-Region-Specific Climate Models have Higher Accuracy
		100	100		Y	35	2017	Review Shows Many Possible Approaches to Co-Production
6	6	88	82		Y	36	2017	Rethink of Conservation Strategy Tenets Underway at Many Organizations
76	21	3	-73	Y		37	2018	5yr Seasonal Climate Forecasting Becoming Reliable
15	27	58	43			38	2019	Universities Increasingly Incentivize Applied Research, Field Impact, and Stakeholder Engagement
	6	94	94		Y	39	2020	SW Water Research Additionally Focuses on Flood Events
National CSC Issues								
42	52	6	-36			40	2016	Coordinated National CSC Plans by HQ Divert Regional CSC Goals
9	33	58	49			41	2016	One CSC Builds Best Practices Database, Other CSCs Ignore It
64	33	3	-61	Y		42	2017	USGS Simplifies Project Funding Rules for CSCs
24	58	18	-6			43	2017	CSCs Allowed to Use 25% of Funding "Out of Network"
33	42	24	-9			44	2019	DOI Funding is Skewed Toward Regions with Most Federal Lands
National CSC Strategy								
82	18		-82	Y		45	2016	CSCs Establish Standard Climate Scenarios to Use in Vulnerability Assessments

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Current Expectations Summary

HU%	UN%	HL%	Cer%	HU	HL	Card#	Year	Event Text
52	21	27	-25			46	2016	CSCs Kick-Off Program for Common Framework for CC Indicators, Protocols, and Monitoring
12	30	58	46			47	2016	CSC Project Funding Now Includes Time and Resources for Periodic Meetings with Stakeholders
3	45	52	49			48	2016	CSC Funding Increases Opportunistically
9	48	42	33			49	2017	CSCs Develop Cadre of Science Translators to Facilitate Discussion between Scientists and Practitioners
21	64	15	-6			50	2017	CSC Drought Project Hugely Successful in Eyes of Resource Managers
21	42	36	15			51	2017	CSC Network Policy Requires All Research to Have Explicit Management Need
	36	64	64		Y	52	2018	CSCs Develop Closer Working Relationship with Strategic NGOs and Climate-Focused Foundations
18	42	39	21			53	2018	CSCs Sponsor "Best Co-Production Project" Awards
27	70	3	-24			54	2018	CSCs Forges Closer Relationship with USGS
27	45	27	0			55	2018	Diverse CSCs Nonetheless Offer a Set of Uniform, Unique Services
Federal Policy								
3	9	88	85		Y	56	2017	Annual Budget Cycles Undermine Planning for Climate Adaptation and Resilience
82	18		-82	Y		57	2017	New Congress Increases Funding for Environmental Monitoring
21	79		-21			58	2017	Congress Eliminates the LCCs
21	61	18	-3			59	2018	Congress Supports Strategic Step-up in Funding for Climate Change Organizations
6	58	36	30			60	2020	FWS Issues Directive on Interpreting ESA in the Face of Multiple Stressors and Reduced Resources

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015

Current Expectations Summary

HU%	UN%	HL%	Cer%	HU	HL	Card#	Year	Event Text
42	45	12	-30			61	2020	Coastal Impacts from Coastal Storms in Southern California Lead to Increase Federal Funding for Sea Level Rise Adaptation, Hurting CSC Funding

End of: **External**

Total Highly Likely: 18 30% Total Highly UnLikely: 6 10%

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
Number of Records: 113										
External										
Southwest Climate										
+			+					1	2017	Studies Show that Most CA Trees Will Be Out of Favored Climate at Century's End
+	+		+	+	Y			2	2018	A Review Paper in *Science* Indicates a Big Increase in Number of Ecosystems Experiencing Step Changes
+	+		+	+	Y		Y	3	2018	It's Just One Damned Thing After Another Out There In The Real World
				+				4	2018	US Food Prices Increase Sharply
	-		-	-			Y	5	2018	Strong El Nino Brings Back Bad Old Habits
	-		+	+				6	2019	Central Arizona Project Water Allocation Cut by 40%
+	-		+	+	Y			7	2019	Lake Mead Hits 1024', Colorado River Compact Open to Discussion
	+		+	+			Y	8	2020	Massive Forest Dieback Across the SW Drives Managers to Triage Priorities
Stakeholder Needs										
+			+					9	2017	Support for Government Action on Climate Change Reaches 75% of General Population in Southwest
		+	+	+				10	2017	Recalcitrant State Governments Now Seek Help on Climate Adaptation
			+					11	2018	Development of Narratives Using Analytics Develops Strong Connections to Stakeholders
+							Y	12	2019	Boundary Organizations Effective in Helping Society Ramp Up to Climate Challenge

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
Frontline Managers										
-	-		-				Y	13	2015	Survey Indicates Federal Land Managers Are Not Following Literature on CC and Adaptation
								14	2017	County Offices Are Key to Reaching People on the Ground
	+	+	+				Y	15	2017	Resource Managers Flock to Science/Adaptation Sessions
							Y	16	2017	Scenarios Begin to be Used to Screen Specific Resource Manager Decisions
	-	-	-	-	Y		Y	17	2018	Post-Project Assessment of 3 SW CSC Projects Indicate Resource Managers Not Using the Tools
-	-	-	-	-	Y			18	2019	DoI Land Managers Unable to Implement SW CSC Findings
			+				Y	19	2020	DOI Rewards 25 Resource Managers for Best Adaptation Planning
+		+					Y	20	2020	65% of SW DOI Management Units have Climate Change Adaptation Plan
LCCs										
+		+	+				Y	21	2016	CSC HQ Promotes the Value of LCCs
								22	2016	LCCs Leverage $2 in Partner Money for Every $1 of LCC Spending
+	+	+	+		Y			23	2016	CSCs Pull Together All LCCs in their Region
+	-	-	-	-	Y	Y		24	2016	CSC Supported Survey Indicates that Most Stakeholders Prefer to Deal Only with the LCCs
+								25	2016	CSCs Fund LCCs to Distribute Findings
SW Climate Orgs										
+	+		+					26	2016	CSC and LCC Conduct Joint Strategy Sessions on Research Agendas
+	+							27	2018	DOI Welcomes Integrated Climate Change Plan from Southwest
-	-	-	-	-	Y			28	2019	CSC/LCC Attrition Disrupts Many Projects

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
Science										
+		+	+	+	Y		Y	29	2016	Researchers Report Benefit from Review of Applications of their Work
	+		-				Y	30	2016	Adaptation Decisions Often Have Undesirable Mitigation Implications
-								31	2016	Half of All Climate Science Papers from US Authors are Uncited
				+		Y		32	2017	Ecosystem Model Fails, Causing Species Collapse
		+						33	2017	Co-Production Solves the Problem of Long Waits for Research Results
+			+					34	2017	Detailed Sub-Region-Specific Climate Models have Higher Accuracy
		+					Y	35	2017	Review Shows Many Possible Approaches to Co-Production
	+		+	+			Y	36	2017	Rethink of Conservation Strategy Tenets Underway at Many Organizations
						Y		37	2018	5yr Seasonal Climate Forecasting Becoming Reliable
	+	+	+	+	Y			38	2019	Universities Increasingly Incentivize Applied Research, Field Impact, and Stakeholder Engagement
+			+				Y	39	2020	SW Water Research Additionally Focuses on Flood Events
National CSC Issues										
-	-	-	-	-	Y			40	2016	Coordinated National CSC Plans by HQ Divert Regional CSC Goals
	-		-	-				41	2016	One CSC Builds Best Practices Database, Other CSCs Ignore It
+	+	+	+	+	Y	Y		42	2017	USGS Simplifies Project Funding Rules for CSCs
+		+	+	+	Y			43	2017	CSCs Allowed to Use 25% of Funding "Out of Network"
+				+				44	2019	DOI Funding is Skewed Toward Regions with Most Federal Lands
National CSC Strategy										
+		-	+			Y		45	2016	CSCs Establish Standard Climate Scenarios to Use in Vulnerability Assessments

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
	+							46	2016	CSCs Kick-Off Program for Common Framework for CC Indicators, Protocols, and Monitoring
-	+	+	+		Y			47	2016	CSC Project Funding Now Includes Time and Resources for Periodic Meetings with Stakeholders
			-	+				48	2016	CSC Funding Increases Opportunistically
-	+	+	+	+	Y			49	2017	CSCs Develop Cadre of Science Translators to Facilitate Discussion between Scientists and Practitioners
+	+	+	+		Y			50	2017	CSC Drought Project Hugely Successful in Eyes of Resource Managers
-		+						51	2017	CSC Network Policy Requires All Research to Have Explicit Management Need
+	+			+			Y	52	2018	CSCs Develop Closer Working Relationship with Strategic NGOs and Climate-Focused Foundations
								53	2018	CSCs Sponsor "Best Co-Production Project" Awards
			+					54	2018	CSCs Forges Closer Relationship with USGS
	+		+					55	2018	Diverse CSCs Nonetheless Offer a Set of Uniform, Unique Services
Federal Policy										
	-	-		-			Y	56	2017	Annual Budget Cycles Undermine Planning for Climate Adaptation and Resilience
+		+	+	+	Y	Y		57	2017	New Congress Increases Funding for Environmental Monitoring
-		-	-	-	Y			58	2017	Congress Eliminates the LCCs
+		+	+	+	Y			59	2018	Congress Supports Strategic Step-up in Funding for Climate Change Organizations
				+				60	2020	FWS Issues Directive on Interpreting ESA in the Face of Multiple Stressors and Reduced Resources
-	-							61	2020	Coastal Impacts from Coastal Storms in Southern California Lead to Increase Federal Funding for Sea Level Rise Adaptation, Hurting CSC Funding

Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text

End of **External**

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
Internal										
SW CSC Strategy & Operations										
+			+					62	2016	Consortium PIs & SW CSC Agree on Shared Vision, Strategy, Objectives
		+		+				63	2017	SW CSC Establishes Impact Metrics and Evaluation Process
+			+					64	2018	SW CSC Completes Overview of All Climate Projects in Region
	+	+						65	2018	SW CSC Holds Regular Joint Stakeholder/Scientist Workshop
-				-				66	2018	SW CSC Acts as Resource Leveler
Research Partnerships										
+								67	2015	SW CSC Science Review Committee Holds Biennial Face-to-Face Meetings
	-			+				68	2016	SW CSC and CCASS Develop Strong Partnership on Co-Production
	+	+	+	+	Y			69	2016	BLM, Forest Service, BoR Become Active Partners with SW CSC
		+		+				70	2017	SW CSC Funds Significant Social Science Research
+								71	2018	SW CSC Expands the University Consortium
-			-					72	2019	Ecologists Dominate Core PI Team, More Than Physical Scientists
SW CSC Partnerships										
				+				73	2015	SW CSC Supports Southern Rockies LCC "Connections Workshops"
-	+	+	+	+	Y			74	2016	SW CSC Hosts Annual Climate Workshops for Stakeholders
+	+		+					75	2016	SW LCCs and SW CSC Clarify Responsibilities
		+		+				76	2016	SW CSC Partners with Regional Forest Managers
+			+					77	2016	SW CSC Connects to Existing Outreach Groups, Avoids Building Their Own
+		+	+	-	Y			78	2017	SW CSC and WUCA Partner on Water Research

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015
Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
		+		+				79	2017	SW CSC is "At the Table" When Stakeholders Do Their Planning
				+				80	2018	SW CSC Partners with NCEAS to Establish Climate War Room
-		+						81	2018	CSCs and LCCs Prioritize Tribal Integration into Regional Water Initiatives
SW CSC Focus Areas										
				+				82	2015	SW CSC De-focuses Investments on Downscaling
+	+	+	+		Y			83	2016	SW CSC Focuses on Approaches to Dealing with Uncertainty
+				-				84	2016	SW CSC Focuses on Climate Model Harmonization
+	+	+		+	Y			85	2016	SW CSC Focuses on How to Assist the Development of New Ecosystems In the Wake of Large Disturbances
+			+	+				86	2017	SW CSC Supplies Managers with Parameters of Extreme Planning Outcomes
+			-	-				87	2017	SW CSC Focuses on a Few Large Interdisciplinary Projects
-		+		+				88	2017	SW CSC Translators/ Applied Scientists Respond to Crisis Needs with Action, Not Research
+			+	-				89	2019	SW CSC Provides Integrated Precipitation Model
SW CSC Co-Production										
		+	-					90		SW CSC University Consortium Develops Network-Wide Co-Production Progam
-		+	-	-	Y			91	2015	SW CSC Selected for Pilot Project on Co-Production
								92	2016	Project Leaders Work with Practitioners on Data Standards
	+	+	-	-	Y			93	2016	CSC Network Sponsors Regional Workshops on Co-Production Techniques
	+	+						94	2017	SW CSC Offers Short Course for Scientists on Engaging with Practitioners
SW CSC Projects										
	+	+		-				95	2015	SW CSC Creates Federal Agency 101 Webinar for Researchers

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015

Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
-	+		+	-	Y			96	2016	SW CSC Builds Regional Social Network and Online Community for SW Climate Adaptation
+	+							97	2017	SW CSC Provides Scenario Training to LCCs and Others
	+			+				98	2017	SW CSC Performs Climate Change Readiness Assessment
-								99	2017	SW CSC Creates Decision Support Tool in Partnership with LCCs
-								100	2017	SW CSC Completes Study of Decision Making among its Stakeholders
	-							101	2018	SW CSC Self-Funds Outreach Program to Meet Demand
	+							102	2018	SW CSC Convenes Cross-Jurisdictional Meetings to Address Boundary-Crossing Adaptation Issues
SW CSC Staffing										
-		+	+	+	Y			103	2016	SW CSC Hires Science Translators
		+	+					104	2016	SW CSC Hires Applied Climate Scientist
	+	+		+				105	2017	SW CSC Sets Up Rotation Program for Specific Needs
		+						106	2017	SW CSC Targets Young Researchers for Co-Production
	+	+						107	2018	SW CSC Hosts Interns from Tribal Colleges
External Communications										
	+		+					108	2016	SW CSC Develops, Funds, Prioritizes Full Communications Plan
	-							109	2017	Public Education Events Held by the SW CSC Draw Powerful and Connected People
	+	+						110	2017	The SW CSC Creates Standard Set of Climate 101 Presentations for Stakeholders & Partners to Use
				+				111	2017	SW CSC Provides Science-Backed "Talking Points" for Big Climate Stories

End of **Internal**

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015

Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text
New										
			+					112		25% of Cali in ashes, largest El Nino in history floods & washes away seeds
			+					113		Build strong relationships with key resource mgt leaders

End of **New**

Future Scenarios for the USGS
SW Climate Science Center
Sacramento, CA
September 15-16, 2015

Full Voting Results Summary

A	B	C	D	E	CM	HU	HL	Card#	Year	Event Text

Aggregate Statistics

Total Events: 113

Total Number Common to 4 Teams: 28

Total Number of Highly Likley: 18

Total Number of Highly Unlikley: 6

Team	# in Scenario	# Common	# Consistent	#Inconsistent
A	58	24	7	5
B	49	20	7	5
C	48	24	7	4
D	59	27	9	7
E	57	24	6	6

A Southwest Climate Science Center *Index*

Number of DOI Climate Science Centers nationally: 8
Number of states in the Southwest[1]: 4
Year in which the SW CSC was launched: 2011
Number of SW CSC staff, federal side: 2.35
Number of SW CSC staff, university side: 1.5
Percentage of all federally administered lands that are in the Southwest: 25
Percentage of all lands administered by the Department of Interior that are in the Southwest: 25
Percentage of all tribal lands that are in the Southwest: 25
Percentage of all National Park Service lands that are in the Southwest: 17
Percentage of all Bureau of Land Management lands that are in the Southwest: 35
Percentage of all Department of Defense lands that are in the Southwest: 43
Percentage of all National Forest lands that are in the Southwest: 22
Rank of the Southwest in total percentage of lands administered by, respectively, the federal government, the Department of the Interior, the Bureau of Land Management, the National Park Service, the Fish & Wildlife Service, the US Forest Service, and the Department of Defense: 2, 2, 1, 2, 2, 2, 1[2]
Number of Landscape Conservation Cooperatives in the Southwest: 5
Number of Fish & Wildlife Service Regions in the Southwest: 3
Number of Forest Service Regions in the Southwest: 3
Number of National Park Service Regions in the Southwest: 2
Number of U.S. Geological Survey Regions in the Southwest: 2
Number of USDA Climate Hubs in the Southwest: 1
Number of DOI management units in the Southwest[3]: 1,156
Number of National Parks in the Southwest: 66
Number of Native American reservations in the Southwest: 151
Percentage of reservations in the US that are in the Southwest: 48
Percentage of lands in the Southwest that are administered by the federal government: 67
Percentage of lands in the Southwest that are administered by the Interior Department: 48
Percentage of lands in the Southwest that are administered by tribes: 9
Percentage of lands in the Southwest that are administered by BLM: 33
Percentage of lands in the Southwest that are part of National Parks: 5
Percentage of lands in the Southwest that are in National Forests: 14

[1] 'Southwest' is defined here as California, Nevada, Utah, and Arizona, the four states primarily covered by the SW CSC.
[2] Alaska is ranked #1 for federal, DOI, NPS, and FWS lands; the Northwest (Washington, Oregon, Idaho) is #1 for Forest Service lands.
[3] "Unit" refers to a reservation, wilderness area, refuge, park, reservoir, or other administrative management unit.