

Plenary Program and Events

ISSS-2016 Boulder

(Note: Due to special programs this year we have a full 5-day main program schedule through Friday evening. Students completing projects and those planning future activities will meet on Saturday following the conference. We will also host pre-conference workshops on Sunday before the conference, and a special student program beginning Thursday evening (reception) before the conference.)

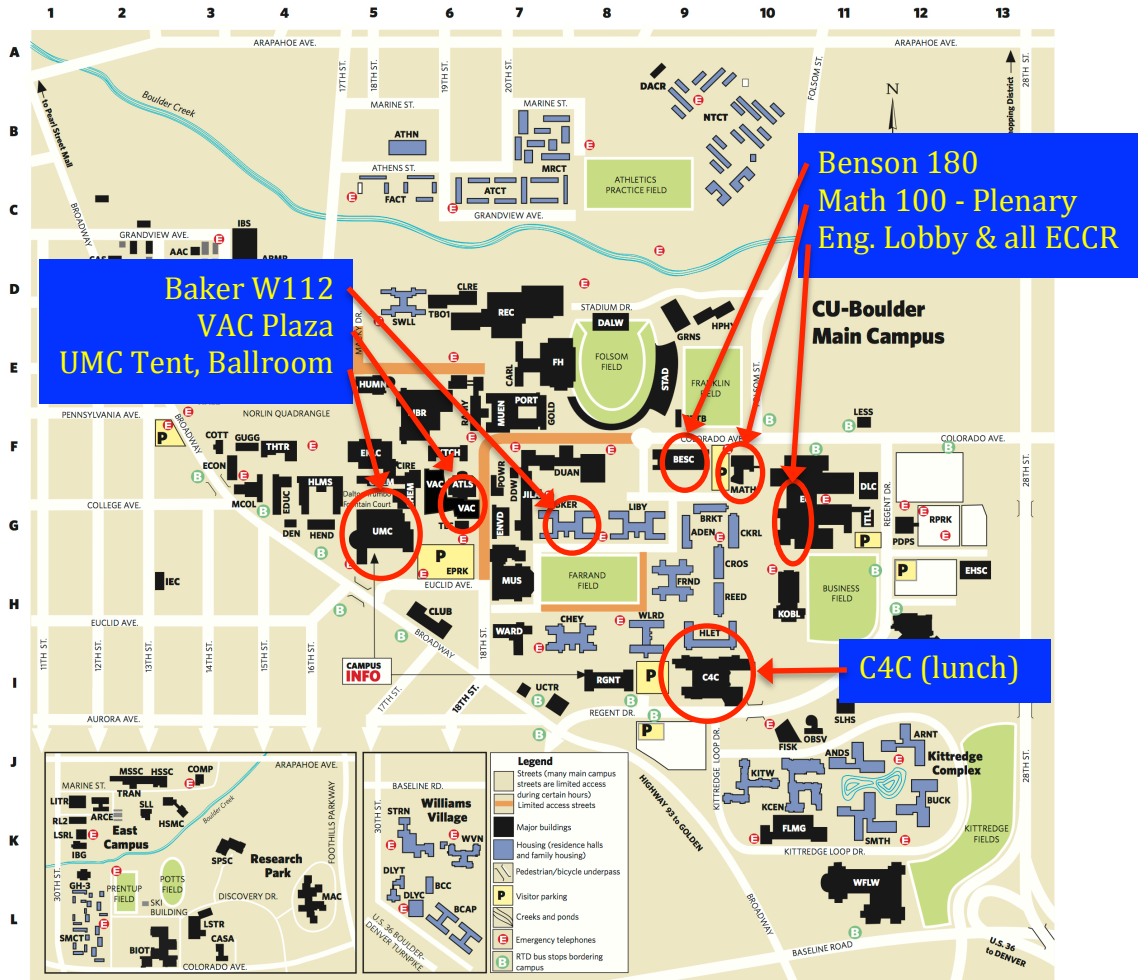
Pre-Conference Program (Boulder)

- *21 July (Thursday evening):*
 - Start of Conference in India – Vignan University
 - 16:00 – 21:00 **STiP** (grad course) **Student Welcome**
Instruction starts Friday before the conference, and continues through Saturday, after the conference. There are also Pre-conference and Post-conference assignments. Chairs: Ray Ison, Peter Tuddenham, Gary Metcalf, Jeremiah Osborne-Gowey.
- *22 July (Friday):*
 - 9:00 – 17:00 Recorded Video Stream from India (Math 100)
 - 9:00 – 17:00 **Student Program**
- *23 July (Saturday):*
 - 9:00 – 17:00 Independently organized meetings
 - 9:00 – 17:00 Recorded Video Stream from India (Math 100)
 - 18:00 – 20:00 **ISSS Board Meeting** (Taj Restaurant Basemar: 2630 Baseline; 303-494-5216)
- *24 July (Sunday):*
 - 7:15 - 8:15 **US-India Roundtable I.** (ECCR 139)
 - 9:00 -18:00 Delayed Video Broadcast from India (Math 100)
 - 9:00 - 18:00 **ISSS Workshops and Special Events**
 - 9:00 - 18:00 **ISSS Registration** (Engineering Lobby)
 - 18:00 - 18:30 **60th Anniversary Ceremony** (VAC Plaza)
 - 18:30 - 20:30 **ISSS Reception and Registration**
 - 19:30 to 20:30 **US-India Roundtable II.** [UMC Tent]

Boulder Conference Venue: University of Colorado, Boulder, Main Campus

- **Pre-Conference Graduate Course**
 - **Main Classroom:** Baker W112
 - **Break-out rooms:** ECCR 131, 139
- **Sunday Pre-Conference Program**
 - **Morning Global Roundtable:** ECCR 139
 - **All Day Registration:** Engineering Lobby and Math Plaza
 - **Opening Ceremony:** Visual Arts Complex Plaza (near UMC)

- **ISSS Reception and Evening Registration:** UMC Tent
- **Sunday Evening Global Roundtable:** UMC Tent
- **Main Conference Program**
 - **M-F Morning Roundtable:** C4C Tree Room
 - **Main Plenary Room:** Math 100
 - **AM Breaks:** Math Courtyard
 - **Lunch:** Center for Community (C4C); Wednesday Box Lunch (UMC 235)
 - **Concurrent Breakout Rooms (presentations and workshops):**
 - ECCR (Engineering Center Classrooms) 1B51, 1B55, 131, 139, 151, 200, 245, 265
 - Benson 180
 - **Posters and Afternoon Break Area:** ECCR Lobby
 - **Banquet:** UMC Glenn Miller Ballroom
- **Daily Schedule (M, Tu, W, Th, F)**
 - 7:00 – 8:20 Breakfast (C4C Meal Cards)
 - 7:15 – 8:15 Roundtable (C4C meeting room)
 - 8:30 – 10:15 Morning Plenary I
 - 10:15 – 10:30 Break/Social
 - 10:30 – 12:15 Morning Plenary II
 - 12:15 – 13:30 Lunch/Social (including special events)
 - 13:30 – 15:00 Concurrent Presentation/Workshop Session I
 - 15:00 – 15:30 Break/Social
 - 15:30 – 17:00 Concurrent Presentation/Workshop Session II
 - 17:00 – 19:00 Break/Refresh/Dinner (admin meetings as needed)
 - 19:00 – 22:00 Special Evening Programs.



Need a Place to Park? Campus parking maps are available at Parking and Transportation Services, 1050 Regent Drive. View online at www.colorado.edu/pts/maps.

PROGRAM

Day 1 (Monday, July 25): **Systems Thinking for Systemic Sustainability**

- **8:30 – 10:15 Plenary I – *The Challenge of System(s) Sustainability***

Description: This year's conference focuses on what it means for a system to be sustainable ("systemic sustainability"): exploring more holistic science and thinking to understand, manage, and create sustainability in complex socio-ecological systems. We are intentionally stepping outside traditional comfort zones to explore new territory and possibly find new answers. For this we recognize the importance of empowering students; removing philosophical and institutional blocks to their inquiry into such questions, and providing them with the best tools to guide their research and practical experiences. From development of new theories and practices to integration of existing ones, our challenge is to determine what will lead society into the transformations needed for a sustainable future and beyond to even greater symbiotic and innovative opportunities; and how we as a society can help initiate those changes.

Chair: John Kineman

Speakers:

- **Opening:**
 - **8:30 Jennifer Wilby** – *Opening announcements*
 - **8:35 John Kineman** – *Conference Program: Realizing Sustainable Futures*
 - **Keynotes** (times include Q&A):
 - **8:55 – 9:35 Gunter Pauli** – *The Blue Economy: How innovations in technologies and business models set new rules for sustainability.*
 - **9:35 – 10:15 Peter Tuddenham** – *Systems Literacy Education Goals*
- **10:15 – 10:30 Break**
- **10:30 – 12:15 Plenary II – *Towards Holistic Systems Thinking***

Description: Although every environmental agency today is calling for ways to manage whole ecosystems, we do not know how to do that. Our theories and methods to address the question of whole-system sustainability are incomplete and as a result our actions regarding individual processes, sectors, and resources can contribute to problems as much or more than to solutions. How can systems thinking help us move to another level of understanding where we can address the pressing complex systemic issues of inter-related socio-ecological systems to resolve the dysfunction of their often contradictory sectors and components?

Chair: Judith Rosen

Speakers:

- 10:30 – 11:15 **Judith Rosen** – *What The Science of Anticipatory Systems Can Illuminate About Science Itself.*
- 11:15 – 11:45 **David Rousseau** – *Scientific principles for a general theory of whole systems.*
- 11:45 – 12:15 **Shankar Sankaran** – *Action Research Methods.*

- 12:15 – 1:15 **Lunch** (C4C Meal Cards)

- **Afternoon Paper and Workshop Sessions** {see Conference Schedule}
 - 13:30 – 15:00 **Session 1**
 - 15:00 – 15:30 **Break**
 - 15:30 – 17:00 **Session 2:**

- 7:00pm - 9:30pm **Public Program: Next Steps to Realizing a Sustainable Future** (ISSS & the WILD Foundation, public event at Macky Auditorium)
Description: As we reach global limits of human growth in many dimensions, advanced thinking is required to operate in ecological balance with nature and to create more symbiotic opportunities. Join us for an informative evening of public talks on anticipating the future of nature and humanity. **Chair:** Amy Lewis
Panel:
 - **Gunter Pauli** (The Blue Economy)
 - **John Fullerton** (Regenerative Capitalism)
 - **William Becker** (Global Change)
 - **Marc Bekoff** (Life and Human Values)
 - **Ilarion Mercurieff** (Indigenous Wisdom)
 - **Jeff Orolowski** (Nature Documentary)
 - **Joshua Tewksbury** (Future Earth Science)

Day 2 (Tuesday, July 26): Global Science and Assessment

- 8:30 – 10:15 **Plenary III: Connecting Human and Natural System(s) Research**
Description: Current ecological trends present a dramatic picture of potentially catastrophic change in the world. At the same time, our human and societal response mechanisms seem poorly designed for coping with complexity, and science seems unable to address systemic problems and systems as a whole. What are the challenges in science, policy, and ethics to become a sustainably healthy civilization with creative options for the future?
Chair: Jeremiah Osborne-Gowey
Speakers:
 - 8:30 – 9:00 **Carol Wessman** (ENVS/CIRES) – *Linking Science, Policy, and Ethics in Sustainability Science at the University of Colorado*
 - 9:00 - 9:30 **Bruce Milne** – *Sustainability Science*

- 9:30 – 10:00 **Joshua Tewksbury** – *Living in the Anthropocene: Science, Sustainability, and Society*
- 10:00 – 10:15 **Q&A**
- 10:15 – 10:30 **Break**
- 10:30 – 12:15 **Plenary IV: *Crisis Science: Anticipatory, Real-Time, and Preventive***

Description: Adequate resilience and appropriate response (interventions) to crises and disasters and continuous improvement thereof is a growing global need and a social responsibility in view of the seemingly growing number of disasters endangering a growing number of people and even our civilization. Can we do a better job of anticipating, systemically understanding and mitigating the cycles of crisis and recovery by combining exploratory ‘crisis science’ with long-term ‘sustainability science’? Can we unravel the antithesis of incompatible response systems and find new ways to integrate scientific, technological, cultural, ethical, political and economic influences? Preparedness must systemically consider the often emergent interplay of supporting and obstructing factors. Actual interventions (responses) must holistically evaluate the total situation and make decisions, unfortunately to be performed under high uncertainty, extreme stress and time pressure. Despite the often singularity of disasters we have to identify similarities and powerful abstraction in order to support scientific analysis and improved mitigation. A long range target could be an interdisciplinary ‘Strategic Crisis Science’. The panel of international experts will discuss these issues from their different backgrounds and national priorities with respect to preparedness and interventions. We will attempt to establish common grounds and basic solutions.

Chair: Gerhard Chroust

Speakers:

 - 10:30 **Gerhard Chroust** - Expecting the unexpected, coping with crisis
 - 10:40 **Roberto Poli** – *Towards a Science of Anticipation*
 - 11:15 **James P. Syvitski** – From politics to remote sensing: The Indus Flood of 2010 – unfolding of a disaster and lessons learned
 - 11:50 **Q&A**
- 12:15 -1:15 **Lunch** (C4C Meal Cards)
- 13:30 – 17:00 **Paper and Workshop Sessions** {see Conference Schedule}
 - 13:30 – 15:00 **Session 1**
 - 15:00 – 15:30 **Break**
 - 15:30 – 17:00 **Session 2**

- 19:00 – 21:00 **Colloquium: *Edge of Science: Thresholds and new paradigms***

Chairs: Dominique Surel and Pamela Henning

Description: Participatory, real-time science, or holistic science is the heart of the emerging new paradigm of sustainability science and anticipatory science. We can see it exemplified in science conducted during a crisis, which is quite different from disciplinary science in which we are used to knowing the questions and priorities for research. During crises even the questions must be discovered, disciplines must be combined or transcended, and people and institutions must collaborate. We will look at some characteristics of this exploratory edge of science that seems so important for the study of systems. We will also examine social and psychological factors that tend to resist exploratory science, making it difficult to study complex phenomena, crises or impending crises; and thus requiring a special set of personal skills. Today the challenge of complex systems means a great need for new science that can deal with more than traditional causes and mechanisms. This will be an evening of penetrating discussion on three topics (a) the need for an exploratory phase of science, (b) requisite human capacity for systems thinking and (c) peer and institutional resistance to threshold ideas and new paradigms.

Program:

- 7:15 - 7:45 **Gary Machlis** - *The distinctive Characteristics of Science During Crisis*
- 7:45 – 8:00 **Dominique Surel** – *Human Capacity for Systems Thinking*
- 8:00 – 8:15 **Pamela Henning** – *Psychology of empowering and Supporting Student Research*
- 8:15 – 9:00 Facilitated discussion
Pamela Henning, Dominique Surel, John Kineman, Gary Machlis

Day 3 (Wednesday, July 27): Cultural, Ethical, and Economic Wisdom

- 8:30 – 10:15 **Plenary V: *Making Sense in Economics, Ethics, and Policy***

Description: We need to examine the foundation of our global economic system that assumes unlimited growth in a finite world, to consider the paradigms of regenerative capital, steady-state economics, and innovation. This means developing and putting into practice economic models that allow for growth in innovative quality of human and natural communities without the limits of unsustainable quantitative economic growth

Chairs: Alec Tsoucatos and Mila Popovitch

Speakers:

- 8:30 – 9:00 **John Fullerton** – *Reimagining Capitalism: Transitioning to a Regenerative Economy*
- 9:00 – 9:15 **Alec Tsoucatos** – *The Economics of Care, Wisdom and Empowerment*

- 9:15 – 9:30 **Mila Popovitch** - *Economics of Dignity and New Economy: Valuing Planet, People and Progress*
- 9:30 – 10:15 **Panel Discussion**
Chair: Mila Popovitch
Panelists:
 - **Elizabeth Kucinich**
 - **John Fullerton**
 - **Gunter Pauli**
 - **Alec Tsoucatos**
- 10:15 – 10:30 **Break**
- 10:30 – 12:15 **Plenary VI: Multi-Cultural Worldviews on Sustainability**
Description: Ancient and native cultures have a direct experiential knowledge of whole systems and what is a sustainable natural balance. What are the lessons and how do we incorporate them into modern science, leadership, and society?
Chairs: Dominique Surel and Vijay Gupta
Panelists:
 - **Bruce Milne**
 - **Greg Cajete**
 - **Jamal Martin,**
 - **David Begay**
 - **Nancy Maraboy**
 - **Rudy Miick**
- **12:25 – 1:25 Special Brown Bag Public Program: *Inter-Faith Perspectives on Global Sustainability*** (ISSS and Center for Process Studies, Public Event at UMC 235)
Description: In the face of unprecedented global change, Pope Francis recently challenged people of all faiths to unite together for what he called "integral ecology." Is his appeal compelling? What of a similar nature has been said in other faith traditions and what is new about this appeal? This interfaith panel discussion on global sustainability will explore a variety of faith perspectives that may contrast or correlate with the Pope's *Laudato Si': On Care for Our Common Home*. Scholars and religious leaders representing diverse faith traditions will engage with one another to discuss the roots and meanings of "integral ecology" and this contemporary call to action.
Chairs: Andrew Schwartz and Alec Tsoucatos
Panelists:
 - **Loriliai Biernacki** - Hinduism
 - **Anne Parker** – Buddhism
 - **Aun Ali** – Muslim
 - **Glenn Morris** – Native American

- **Marc Soloway** – Jewish
- **Todd Wynward** – Christian
- **Venugopal Damerla** – Vedic Tradition

- 13:30 – 17:00 **Field Trips: NCAR / Mesa Trail**
Description: NCAR is an NSF research facility that studies the global environment and is open to the Public. It is situated next to the Boulder Mountain Park and Mesa Trail. NCAR staff will greet each group and give a short talk about NCAR outside in the natural setting of the Mesa. Visitors are then free to browse the exhibits or walk along the Mesa trail.
Schedule: (30 persons in each Group; signup at Registration Desk)
Group I: 13:30 departure from Benson/Math – 15:15 return from NCAR
Group II: 15:00 departure from Benson/Math – 16:45 return from NCAR

- 13:30 – 17:00 **Workshop Sessions** {see Conference Schedule}
 - 13:30 – 15:00 **Session 1**
 - 15:00 – 15:30 **Break**
 - 15:30 – 17:00 **Session 2**

- 5:30 – 6:30 **ISSS Council Meeting/Dinner** (C4C)

- 7:00 – 9:00 Special Evening Dialogue: **Robert M. Hutchins Memorial Dialogue on Anticipating Global Futures**
Description: Robert M. Hutchins’ dialogues were centered on the idea that systems theory is needed to anticipate the future of human and natural systems and to advance science, governance, societal development, and educational systems. Continuing in the spirit of these dialogues, this will be an open, multi-faceted discussion about issues of sustainability in socio-ecological systems.
Chairs: Judith Rosen; Debora Hammond

Day 4 (Thursday, July 28): Systems Theory, Management, and Practice

- 8:30 – 10:15 **Plenary VII: Engineering Sustainable Systems and Technology**
Description: To build sustainable and thriving systems, societies, and civilizations we need to combine real-world experience with practical methods in engineering, design, cybernetics, ethical control systems, service systems, and other emerging technological fields such as bioneering and nanotechnology. How do we transcend current limits to realize innovative and entrepreneurial technological possibilities within a sustainability framework?
Chair: Gary Smith
Speakers:
 - **8:30 – 9:00 Anand Kumar** - *Reflections on the Tata Sustainability Journey*

- **9:00 – 9:30 Rick Dove** - *Enabling and Facilitating Engineered Sustainability*
- **9:30 – 10:00 Diana Mann** - *The Global Water Energy Nexus*
- **10:00 – 10:15 Discussion**

- **10:15 – 10:30 Break**

- **10:30 – 12:15 Plenary VIII: Prospects for Scientific Systemic Synthesis**
Description: Recent times have seen the emergence of new theoretical insights that may help to establish the frameworks, theories and methodologies we need to understand, design, build, explain, communicate about, utilize or operate, maintain, and evolve resilient and sustainable socio-ecological systems. In this panel we bring together experts to present on such emerging developments in the areas of engineering, science, research, practice and philosophy, and to reflect on how these different stands can contribute to the formation of a new systemic synthesis that will make the ‘whole systems perspective’ scientific and practical. The panel presentations will be delivered in the last plenary before lunch, and be followed by an open discussion between the panellists and audience in a break-out session immediately after lunch. *Chair: *David Rousseau*
Panelists:
 - **10:30 – 10:55 Bill Shindel** - *The S* minimal general systems meta-model, and its prospects as a general modelling foundation for Systems Engineering.*
 - **10:55 – 11:20 Len Troncale** - *Systems Processes Theory (SPT) , and its prospects as a general theoretical core for a science of systems and sustainability.*
 - **11:20 – 11:45 John Kineman** - *The PAR/Holon Relational Framework, and its prospects as a general methodology for Systems Research*
 - **11:45 – 11:55 Jennifer Wilby** - *Systemic methodologies and the prospects for enhancing them on the basis of emerging general systems theories and models.*
 - **11:55 – 12:10 David Rousseau** - *Systems Philosophy and the prospects for employing scientific general systems principles as the foundation of a systems worldview.*
 - **12:10 – 12:15 Q & A**

- **13:30 – 17:00 Paper and Workshop Sessions** {see Conference Schedule}
 - 13:30 – 15:00 **Session 1**
 - 15:00 – 15:30 **Break**
 - 15:30 – 17:00 **Session 2**

- **17:30 – 18:00 Annual General Meeting**

- **19:00 – 21:00 ISSS Banquet** (UMC Ballroom)

- **Best Paper Awards** – Alexander Laszlo
- **Press Release** – Paul Sperry and Alec Tsoucatos
- **Incoming Inaugural Address for ISSS 2017** – Ockie Bosch
- **Cultural Program** – Mila Popovitch

Day 5 (Friday, July 29): *Education, Communication, and Capacity*

- **8:30 – 10:15 Plenary IX: *Human Capacity, Communication, and Student Research***

Description: Systemic Sustainability and Systems Literacy ultimately involve transformative changes at the personal and social level. What individual competencies are needed and how will student researchers navigate the treacherous waters ahead for ‘out-of-the-box’ thinkers? We emphasize the importance of integrated personal skills and effective collaborative and innovative networking to build transformative communities.

Chair: Pamela Buckle

Speakers:

- **08:30 – 09:00 Pamela Buckle** *The Challenge of Graduate Research in systems science and practice*
- **09:00 – 09:30 Delia McNamara** (Ranulph Glanville Memorial Talk) – *Importance of collaboration and connection for student research.*
- **09:30 – 10:15 Student Award Papers (Vickers, Rappoport, Mead)**

- **10:15 – 10:30 Break**

- **10:30 – 12:15 Plenary X: *Systems Literacy Education and Outreach***

Description: Achieving sustainable and more synergistic futures requires education in systems thinking and connection with new modes of social communication. Our highest priority should be to legitimize whole systems research and to provide adequate guidance to student/expert collaborative learning within a program of Systems Literacy. How do we ‘train the trainers’ and launch this program?

Chair: Peter Tuddenham

Speakers:

- **10:30 – 11:15 Graduate Course Student Report (introduced by Ray Ison)**
- **11:15 – 12:15 Peter Tuddenham and Delia MacNamara** *Systems Literacy Dialogue*

- **12:15 – 1:30 Lunch** (C4C Meal Cards)

- **1:30 – 3:00 Afternoon Plenary A: *Education Synthesis Panel***

Description: *Conference goals for an educational agenda were explored in a number of special workshops. While theories and approaches are diverse, this panel will provide an opportunity to connect different approaches and to explore common ground toward an agenda for the future of systems education,*

especially related to systemic sustainability praxis, science, policy, and ethics.

Chair: Ockie Bosch

Panel:

- **Ockie Bosch**
- **Peter Tuddenham**
- **Dino Karabeg**
- **Len Troncale**
- **Mary Edson**
- **Ray Ison**
- **Pavel Luksha**

- 3:30 – 5:00 **Afternoon Plenary B: Conference Closing**

Chairs: Ockie Bosch, Peter Tuddenham, John Kineman, and Mila Popovitch

Description: Concluding Program.

- Concluding remarks
- Closing Program

- 5:15 -6:30 **Catered Reception at Fiske Planetarium (Lobby)**

Sponsors: Future Earth and ISSS.

- 19:00 – 21:00 Fiske Planetarium Program: ***The Anthropocene Experience: Shaping Sustainable Futures, From Science to Society, with Josh Tewksbury***

Chair: Joshua Tewksbury

Collaborators: Francisco Salas, Daniel Strain, Owen Gaffney, Daniel Oxenhandler, Nicholas Conant, Theodore Chalfen, and others.

Description: *In the span of several thousand years, humans have gone from a minor player on the Earth to a species capable of reshaping the planet in profound ways. Join us for this immersive experience as Joshua Tewksbury of the global research group Future Earth takes you on a journey from the origins of human societies to the present day -- and addresses how the ingenuity of people around the world can shift the planet, either for better or worse. For more information on Future Earth: <http://futureearth.org/>. This event is being co-hosted by the International Society for the Systems Sciences (ISSS), as the final event of the ISSS 2016 Conference - Realizing Sustainable Futures in Socio-Ecological Systems. For more information: <http://www.iss2016usa-india.com/>*

Saturday, July 30 **Post-Conference Graduate Program (Boulder)**

- 9:00 – 12:00 **Planning sessions for future events, including ISSS-2017.**
- 9:00 – 12:00 **Graduate Course Final Session**