

COMM 132: Science Communication

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Tues/Thurs 11:00am-12:20pm, Center Hall 222
OH: Weds. 9-11am & by appointment, MCC 205

Course Description: Examine Science Communication as a profession and unique form of storytelling. Identify who does Science Communication, how, why and with what impacts. Highlight Science Communication's role in democracy, power, public reason, technological trajectories, the sustainability transition, and shifting University-Community relations.

Key Questions: What is science communication? What is the relationship of science to society, politics, culture and imagination? As a student at UC San Diego do you engage in science communication? What are our responsibilities as critical thinkers and researchers at a public-service focused, publically-funded university? Are we doing enough to communicate and share knowledge with disadvantaged communities? Should community engagement and scholarly communication be a core part of scientists' work? What does good science communication look like? Are there known techniques that work well? What skills and products should we be focusing on (framing, imagination, storytelling, data visualization, performance, exhibits, posters, video, art)? Might proficiency in science communication add value to your career?

Course Requirements

This course includes lectures and discussions coupled with experiential learning gained through field research (e.g., interviews) and in-class presentations. In the context of learning/developing knowledge and skills pertinent to Science Communication you will be required to generate two written assignments, a poster, a three minute video and a three minute oral presentation.

Course Learning Objectives

<i>Philosophy/Theory</i>	<ul style="list-style-type: none">Identify the philosophy and theories of Science Communication, who does it and why – taking into account particular cultural, moral and value systems.
<i>Methods</i>	<ul style="list-style-type: none">Critically assess Science Communication as a diverse set of practices that can both enhance as well as weaken democracy, justice, public reason, and University-Community relations.
<i>Analytics</i>	<ul style="list-style-type: none">Distinguish how competing <i>imaginaries</i>, frames, stories and narratives advance and/or thwart the sustainability transition (i.e., local, regional and global efforts to promote healthy, just and resilient human settlements).
<i>Communication</i>	<ul style="list-style-type: none">Utilize scientific knowledge and storytelling in the form of written words, illustrations, posters, video and speech acts to purposefully communicate with a specific audience.

Course Narrative: Modernity is in the grip of increasingly serious social, economic and ecological problems (e.g., global climate change, health disparities, and food-water-energy insecurities). Some scientists dedicate considerable effort to addressing these problems (e.g., trying to understand and/or solve them); other scientists are complicit in reproducing the problems, or making them worse –even if unintentionally. As a collective human activity, science and technology does not automatically improve our well-being or progress as a species. Our science and technology unfolds in contested, highly uneven/unequal ways that generate great wealth and deep disparities simultaneously. In this class we ask what will it take for science and technology to become more aligned with problem-solving and solutions-oriented efforts aimed at eradicating root causes of poverty, environmental degradation and unhealthy living conditions? We will examine practical efforts to democratize scientific and technological processes through civic engagement and popular education. A growing number of researchers around the world are dedicated to not only communicating their research to the public, but also to working with the public co-developing transformational research agendas that authentically addresses the concerns and needs of communities.

Assignments and Grading

Deliverables	Date due	% Grade
1. Science Communication Story Write a short story (500 words), using the AGT template, featuring some bit of science you want to share with a specific audience. We will provide the ABT template, topics and leads to help you with this task. Upload it to the SCOPE database.	Week 4 Oct. 18	20
2. Science Communication Poster Create a poster (digital version only, no need to print it). See template provided on the class web site. The poster should illustrate the story you developed for assignment #1. Upload it to the SCOPE database.	Week 6 Nov. 1	20
3. Science Communication Video. Create a 3-minute video. See the class web site for ideas (i.e., models, different ways) to do the video. Like the poster, the video should provide another window onto your story. Upload video to YouTube and provide the link to YouTube in the SCOPE database.	Week 9 Nov. 22	20
4. Reflective Essay. Write a 1500 word essay (about 5 pages double spaced) that critically reflects on your science communication project. Use one of the four course learning objectives as a way to organize your essay and demonstrate that you met said objective. Use key concepts/ theories covered in class to enrich your critical reflection. Incorporate into your essay some form of feedback from your target audience.	Week 10 Dec. 1	30
Class Participation: Determined by class attendance (including several writing exercises to be completed in class and collected in class), your 3 minute oral presentation in class, and uploading your project to the SCOPE database.	All Quarter	10
TOTAL POSSIBLE POINTS		100

Required Books:

Jasanoff, S. (2016). *The ethics of invention: technology and the human future* (First edition).

Korten, D. C. (2015). *Change the story, change the future: a living economy for a living earth* (First Edition).

Oakland, CA: Berrett-Koehler Publishers, Inc.

Lakoff, G. (2014). *The all-new don't think of an elephant! : know your values and frame the debate*. White River Junction, Vermont: Chelsea Green Publishing.

Recommended

Jasanoff, Sheila. (2012) *Science and Public Reason*. The Earthscan Science in Society Series. New York: Routledge.

We titled this new course "science communication" because it is a recognized field of scholarly study and professional practice. This title gives us an anchor around which to pivot. But science communication as a frame has limitations too. It tends to concentrate on the physical and life sciences, engineering and medicine. At least until recently, those engaged in science communication have not paid much attention to the arts and humanities, or other culturally and methodologically distinct ways of finding out about behavior and the world we live in. An alternative name for the course could be scholarly communication.

Topic Suggestions: (i.e., scientific content around which to focus your story, poster, video and oral presentation)
The UC Bending the Curve report, especially solution set #10:

- Regenerate damaged natural ecosystems and restore soil organic carbon to improve natural sinks for carbon (through afforestation, reducing deforestation and restoration of soil organic carbon). Implement food waste reduction programs and energy recovery systems to maximize utilization of food produced and recover energy from food that is not consumed. Global deployment of these measures has the potential to reduce 20 percent of the current 50 billion tons of emissions of CO₂ and other greenhouse gases and, in addition, meet the recently approved sustainable development goals by creating wealth for the poorest 3 billion.

In support of the recommendations above (endorsed by 50 faculty from all ten UC Campuses, UC's three National Labs, and the Agriculture and Natural Resources Extension Program):

1. Identify a scientific contribution that underpins one of the recommendation you find especially compelling.
2. Pick a target (e.g., public or private organization, particular group of people) that you think might be willing to act on the recommendation (e.g., implement it)
3. Formulate a framework for communication with your target audience
4. Design the communication in the form of a story, poster, video and oral presentation
5. Carry out/ perform the communication, get feedback on, and critically reflect upon your delivery.

Effective science communication requires skillful use of conceptual frameworks and narratives (story telling). Meaningful science communication also requires that you appreciate diversity and grasp how power relations come into play.

- Understand that knowledge comes from many sources and that the dominant, empiricist approach is only one - and it cannot help us fully understand our world by itself.
- Appreciate how the knowledge people gain experientially is equally as important as knowledge we draw from science. Like science, however, this knowledge must be mined – people must reflect and assess their experiences in order to bring that knowledge to the surface.
- Avoid lopsided thinking that places too great an emphasis on one dimension. The socio-ecological and economic problems we face as a society are both technical and political. Having the technical solution is not enough if the political forces are not also addressed – that means understanding power – who has it and how do they use it.

Plagiarism and Academic Integrity: Presenting the ideas of another person as if they are one's own is a serious academic offense. If you have any questions about the proper method to cite quotations, phrases, ideas, or any other material - whether from published academic work, a newspaper column, a magazine article, an internet website, a classmate, yourself, etc. - please consult the professor. You also need to pay close attention to university standards on academic integrity. It is your responsibility to know these guidelines. <http://www.ucsd.edu/current-students/academics/academic-integrity/index.html>.

Comm 132: Science Communication, Topics and Readings

NOTE: The required readings for Comm 132 are marked with a solid black bullet. The other content is there for those of you that want to do a deeper dive on the subject. The deeper dive content (NOT required) is marked with a hollow bullet below the line that says "For a Deeper Dive." All readings are available on TritonEd, either as an uploaded file or via a link. Topics listed in italics (**colored tan**) indicate in-class group discussion to help you create and complete your story, poster, video, reflective essay and oral presentation.

Week/ Date	Topic	Readings
1. What is Science Communication ? What's at Stake?		
Thursday 9/22	Course Overview	
Tuesday 9/27	What is Science Communication? Is There A Role For Public Engagement In Science? Conflicting views.	<ul style="list-style-type: none"> • Nisbet and Scheufele (2009) What's next for science communication? • Pezzoli. Notes for gene drive discussion • Kuntz (In Press) Critique of gene drive report • Dove and Herman (2016) commentary on Kuntz critique <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ NAS gene drives report, Intro pp. 12-25; Public engagement pp. 131-146 ○ Fischhoff, B. (2013). The sciences of science communication. ○ Schiele, B., Claessens, M., & Shi, S. (2012). <i>Science communication in the world: practices, theories and trends</i>
Thursday 9/29	What's at stake? The case of climate science; fate of the so-called Anthropocene. ❖ <i>Ideas for your story</i>	<ul style="list-style-type: none"> • NYT (2016) : California extends most ambitious climate change law in US • McKibben (2016) The New Republic: We are under attack from climate change <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Hoffman (2012) Climate science as culture war ○ Brown, W. (2015) Undoing the Demos: Neoliberalism's Stealth Revolution (files available on line free at http://www.jstor.org/stable/j.ctt17kk9p8); Preface: Neoliberal Reason and Political Life; I. Undoing Democracy: Neoliberalism's Remaking of State and Subject
2. Framing and the Power of Story, Narratives		
Tuesday 10/4	Framing I: An institutional perspective Guest presentation by Kate Barba (NOAA-UCSD-SIO; Center for Climate Change Impacts and Adaptation) ❖ <i>More Ideas for your story</i>	<ul style="list-style-type: none"> • Lakoff, G. (2004). Don't think of an elephant! : know your values and frame the debate: the essential guide for progressives. Parts I-IV. FRAMING • UC Bending the Curve (Climate Change Report) Executive Summary. • Veerabhadran (Ram) Ramanathan (2016) Climate Change Science and Solutions <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Vandenbussche, L. et al., 2015. "Pathways of Stakeholders' Relations and Frames in Collaborative Planning Practices: A Framework to Analyze Relating and Framing Dynamics

<p>Thursday 10/6</p>	<p>Framing II: The power of stories and narratives</p> <ul style="list-style-type: none"> ❖ <i>Your story assignment: How to do it, what's expected.</i> ❖ <i>The ABT template</i> 	<ul style="list-style-type: none"> • Korton (2015) <i>Change the Story, Change the Future</i>. 1. Our Story Problem; 2. Our Quest to Know, 3. A Brief History of Story Politics; 4. A Living Universe, + <i>DISCUSSION GUIDE</i> • Olson (2015) <i>Houston, We Have a Narrative</i>. Chs.7-8. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Agyeman (2014) "Storying Institutions: Understanding Why Things Are as They Are." ○ Throgmorton (2003). "Planning as Persuasive Storytelling in a Global-Scale Web of Relationships" ○ Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with nonexpert audiences. ○ Downs, J. S. (2014). Prescriptive scientific narratives for communicating usable science.
<p>3. Data Visualization, Mapping and Imagination</p>		
<p>Tuesday 10/11</p>	<p>Data visualization and knowledge integration. Guest presentation by Ilya Zaslavsky, Director, Spatial Information Systems Lab, San Diego Supercomputer Center; Superfund Research Center.</p> <p>Data ownership, Access and Knowledge Commons</p> <ul style="list-style-type: none"> ❖ <i>The poster assignment: How to do it.</i> 	<ul style="list-style-type: none"> • Jasanoff, S. (2016). <i>The ethics of invention : technology and the human future</i>. Ch1. The Power of Technology; Ch6. Information's wild frontiers; 7. Whose knowledge, Whose Property? • Priest (2015) Intro to special issue of <i>Science Communication</i> (re visual communication of science in the digital age) <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Severtson, D. J. (2015). Testing Map Features Designed to Convey the Uncertainty of Cancer Risk: Insights Gained From Assessing Judgments of Information Adequacy and Communication Goals. ○ Hess, C., & Ostrom, E. (2007). Understanding knowledge as a commons : from theory to practice. Ch.1.Introduction: An Overview of the knowledge commons
<p>Thursday 10/13</p>	<p>Ecological Imaginaries and science communication</p> <p>Guest presentation by Scott A. Murray, Organic Farmer and sustainability expert on human-nature relations in cities and working landscapes</p>	<ul style="list-style-type: none"> • Korton (2015) <i>Change the Story, Change the Future</i>. Ch 4. A Living Universe • Pezzoli, K., & Leiter Robert, A. (2016). Creating healthy and just bioregions <i>Reviews on Environmental Health</i> (Vol. 31, pp. 103-109). <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> • Van Dijk, Terry. 2011. "Imagining Future Places: How Designs Co-Constitute What Is, and Thus Influence What Will Be." • Wilke, A. K., & Morton, L. W. (2015). <i>Climatologists' Communication of Climate Science to the Agricul Sector</i>. • Campbell, Heather. (2012) <i>Planning to Change the World: Between Knowledge and Action Lies Synthesis</i>.
<p>4. Risk Communication and Ethics: Co-Producton of Science and Politics</p>		
<p>Tuesday 10/18</p>	<p>The molecularization of biology and human health sciences. Guest presentation by Robert Tukey, Director, UC San Diego Superfund Research Center, Medical School</p> <ul style="list-style-type: none"> ❖ A1: STORY DUE ❖ <i>What storyline did you choose? Why?</i> 	<ul style="list-style-type: none"> • Jasanoff, S. (2016). <i>The ethics of invention : technology and the human future</i>: Ch2. Risk and Responsibility; Ch5. Tinkering with Humans. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Bayer, E., Thompson, D., & Institute of Medicine (U.S.). Roundtable on Population Health Improvement. (2015). <i>Communicating to advance the public's health</i>

		<ul style="list-style-type: none"> ○ Drake, J. et al (2016). <i>Communicating climate-change and natural hazard risk and cultivating resilience</i> ○ Dietz, T. (2013). Bringing values and deliberation to science communication.
Thursday 10/20	<p>Politics of Technology and Science Communication; strategies for science communication. Guest Presentation by Kara Wentworth, PostDoc in Communication, UCSD</p> <p>❖ Ideas for a possible graduate program in Science Communication</p>	<ul style="list-style-type: none"> • Jasanoff (2003) Technologies of humility: Citizen participation in governing science • Scheufele, D. A. (2014). Science communication as political communication <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Brown, W. (2015) Undoing the Demos: Neoliberalism’s Stealth Revolution (files available on line free at http://www.istor.org/stable/j.ctt17kk9p8); IV. Political Rationality and Governance 115; V. Law & Legal reason ○ Jasanoff, S. (2004). Ordering Knowledge, Ordering Society. In S. Jasanoff (Ed.), States of knowledge : the co-production of science and social order (pp. 13-45)
5. Science Communication in Informal Settings and Museums		
Tuesday 10/25	<p>Science Communication strategies engaging residents of low-income, disadvantaged neighborhoods: Examples from the field</p>	<ul style="list-style-type: none"> • Pezzoli et al (2015) Briefing Report on Urban Agriculture and Food Disparities. The Getting Neighborhood EQUIPPED project: Workshops Series and Community-Youth development focused on food-energy-water security. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ National Research Council (U.S.). Committee on Learning Science in Informal Environments (2009). Chap.2 Theoretical Perspectives; Chap. 9 Conclusions, Recommendations, and Future Directions
Thursday 10/27	<p>Museums as Sites of Science Communication</p> <p>Guest presentation by Thomas Herrera-Mishler, CEO and Executive Director of the Balboa Park Conservancy</p>	<ul style="list-style-type: none"> • Bell, L. (2008). Engaging the Public in Technology Policy: A New Role for Science Museums. <i>Science Communication</i>, 29(3), 386-398. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Falk and Dierking (2010) School is not where most Americans learn most of their science ○ Sardo, A. M., & Grand, A. (2016). Science in Culture: Audiences’ Perspective on Engaging With Science at a Summer Festival. <i>Science Communication</i>, 38(2), 251-260.
6. Visual Communicaton of Science for Policy, Planning and Popular Education		
Tuesday 11/1	<p>Visual Communication of Science for policy and planning purposes</p> <p>Guest presentation by Sue Peerson, Faculty in Urban Studies and Planning; Principal in Peerson+Design+Consult, Inc. City of San Diego Planning Commissioner</p> <p>A2: POSTER DUE</p> <p>❖ Story Board Workshop for the Video assignment</p>	<ul style="list-style-type: none"> • Rodríguez Estrada, F. C., & Davis, L. S. (2015). Improving Visual Communication of Science Through the Incorporation of Graphic Design Theories and Practices Into Science Communication. <i>Science Communication</i>, 37(1), 140-148. • Lazard, A., & Atkinson, L. (2015). Putting Environmental Infographics Center Stage: The Role of Visuals at the Elaboration Likelihood Model’s Critical Point of Persuasion. <i>Science Communication</i>, 37(1) <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Brossard, D. (2013). New media landscapes and the science information consumer.

Thursday 11/3	<p>Grassroots Science Communication and Popular Education (<i>pedagogy of the oppressed</i>)</p> <p>Guest presentation by Paul Watson, President and CEO of the Global Action Research Center (The Global ARC) http://www.theglobalarc.org/</p>	<ul style="list-style-type: none"> • Giroux, H. A. (2003). Utopian Thinking Under the Sign of Neoliberalism: Towards a Critical Pedagogy of Educated Hope. <i>Democracy & Nature</i>, 9(1), 91-105. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Bruine. (2013). Assessing what to address in science communication. <i>Proceedings of the National Academy of Sciences</i>. ○ Scheufele, D. A. (2013). Communicating science in social settings. ○ Scheufele, D. A. (2014). Science Communication as Political Communication
7. Science Writing , Video, Big Pixel Data and Immersive 3D Virtual Reality		
Tuesday 11/8	<p>Power of Imagery and Video in Science Communication</p> <p>Guest presentation and Michael Sullivan, Senior Writer, Educational Technology Services, Information Technology Services; and by Erik Jepsen, Photography Expert, University Communications and Public Affairs;</p>	<ul style="list-style-type: none"> • Schneps, et al. (2010). Using Video to Build Learning Contexts Online. <i>Science</i>, 328(5982), 1119-1120. • Welbourne, D. J., & Grant, W. J. (2016). Science communication on YouTube: Factors that affect channel and video popularity. <i>Public Understanding of Science</i>, 25(6), 706-718. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Lambert (2006) Digital Storytelling
Thursday 11/10	<p>Qualcomm: Big Pixel Data, Drones and the 3D Immersive CAVE</p> <p>http://bigpixel.ucsd.edu/</p> <p>❖ <i>Reflective Essay Ideas</i></p>	<ul style="list-style-type: none"> • The Big Pixel Team at UC San Diego has partnered with DigitalGlobe to explore academic uses of a current high resolution base map for the planet. Effort are underway to address large scale persistent challenges in the world by combining geospatial analysis, crowdsourced field data science, data design and visualization, cognitive science, and computer graphics.
8. Civic Imaginaries, Socio-Ecological Systems and the Struggle for Democracy		
Tuesday 11/15	<p>Science Communication, Multidisciplinary Research, and Place-based Planning for Sustainability.</p> <p>Guest Presentation by Juli Beth Hinds, Orion Planning and Design, Bioregional Center for Sustainability Science, Planning and Design</p>	<ul style="list-style-type: none"> • Lakoff, G. (2004). <i>Don't think of an elephant! : know your values and frame the debate : the essential guide for progressives</i>. Part V. From theory to action • Karvonen, A. (2011). Toward the Relational City: Imaginaries, Expertise, Experiments. Ch8 in <i>Politics of urban runoff : nature, technology, and the sustainable city</i>. Cambridge, Mass.: MIT Press. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> ○ Goldstein, B, et al. 2015. "Narrating Resilience: Transforming Urban Systems through Collaborative Storytelling." ○ Innes 2015 <i>Communicative Planning Theory</i> ○ Wong-Parodi, G., & Strauss, B. H. (2014). Team science for science communication. ○ Hoch, Charles. 2016. "Utopia, Scenario and Plan: A Pragmatic Integration."
Thursday 11/17	<p>Democracy, Science Communication and Public Reason</p> <p>Bioregional Imagination: A Rooted Narrative for Science Communication, Social Mobilization and the Bioregional Transition</p>	<ul style="list-style-type: none"> • David Korton (2015) <i>Change the Story, Change the Future</i>. Ch8. A New economics for a new economy; Ch9. A Living economy for a living earth; Ch10. Own the story, own the future • Pezzoli, K. (2015). Bioregionalism. In J. Adamson, W. Gleason, & D. N. Pellow (Eds.), <i>Keywords for Environmental Studies</i>. New York: New York University Press.

		<ul style="list-style-type: none"> • Pezzoli, K. (2016). The Bioregionalization of Survival: Sustainability Science and Rooted Community. In H. Rangan, M. K. Ng, J. Chase, & L. Porter (Eds.), <i>Insurgencies and Revolutions: Reflections on John Friedmann's contributions to planning theory and practice</i>. NY, NY: Routledge. <p><u>For a Deeper Dive</u></p> <ul style="list-style-type: none"> • Brown, W. (2015). <i>Undoing the Demos Neoliberalism's Stealth Revolution</i>: MIT Press. IV. Political Rationality and Governance; VI. Educating Human Capital; Epilogue: Losing Bare Democracy • Jasanoff, Sheila. "Image and Imagination: The Formation of Global Environmental Consciousness." • Jasanoff, S., & Kim, S.-H. (2015). <i>Dreamscapes of modernity : sociotechnical imaginaries and the fabrication of power</i>. Ch 1 Future Imperfect: Science, Technology, and the Imaginations of Modernity.
9. Student Presentations		
Tuesday 11/22 11/24 TG no class	A3: VIDEO DUE Student presentations	
10. Student Presentations		
Tuesday 11/29	Student Presentations	
Thursday 12/1	Student Presentations A4: REFLECTIVE ESSAY DUE	
Finals Week Dec 3-10	No final in this class, only the last assignment (Reflective Essay due Dec.1)	