## Acknowledgements are many in a resource-linked concept map.

## Thanks go to:

Joseph D. Novak, professor emeritus Cornell University, and Alberto Cañas, Director of the Institute for Human and Machine Cognition, and the members of the concept mapping community for the theory and practice of concept mapping over half a century and especially for the development of *CmapTools*, which has placed this tool firmly in the hands of Earth's citizens.

Gene Fry, resource economist and my husband, for his years of professional work on energy efficiency and vocational work on his website Global Warming So What? and for his unflagging efforts to move civilization away from carbon-rich fossil fuels to energy efficiency and renewable resources. He suggested the key concepts on the homepage should be "causes, impacts, and solutions." He also reminded me that businesses have played a huge role in moving this work forward simply because it is in their best interest.

The Climate Literacy and Energy Awareness Network (CLEAN), for their years running teleconferences, vetting educational resources, and participating in professional conferences and organizations. Special thanks to Tamara Ledley for her leadership of CLEAN and suggestion to simplify the structure of the climate change education submaps. Special thanks to Don Dugan-Haas for his constructive criticism of the "wordiness" of the original cmap and Scott Carley for his suggestion to develop the visual graphics to reduce cognitive overload of the homepage. Thanks also to the contributions of Mark McCaffrey, especially his book: Climate SMART & Energy WISE: Advancing Science Literacy, Knowledge, and Know-How.

Mass Audubon for their many climate-change education resources and engaging staff over the years. Special thanks to educator Elizabeth Duff for our collaboration on both strand maps and climate change resources linked to the map and her encouragement to tell the story of the cmap. Thanks also to Education Director Kris Scopinich and Climate Scientist Dan Brown for their encouragement.

National Oceanic and Atmospheric Association (NOAA), the National Aeronautics and Space Administration (NASA) and the National Science Teachers Association (NSTA) for their many resources addressing climate change and the Next Generation Science Standards. Special thanks to Frank Niepold for his efforts to make NOAA resources available to educators and his collaboration with CLEAN. Special thanks to Flavio Mendez, Director of NSTA's Learning Center for his unflagging efforts to streamline access to digital NSTA resources from the Learning Center to teachers.

Museum Institute for Teaching Science (MITS) for its decades of work linking the power of informal science educators and their educational museums and sanctuaries with the professional development of classroom teachers. This community provided many collaborators on the cmap. Special thanks to Linda McIntosh, Education Director, for her suggestion to change the position of the concept bubbles on the homepage. Originally, "climate change was at the top, as a superordinate concept of the whole map. But Linda persuaded me that the homepage would be more understandable to users if the bubbles flowed sequentially through time.

North American Association for Environmental Education (NAAEE) for the EECapacity leadership of Dr. Marianne Krasny, Professor and Director of the Civic Ecology Lab at Cornell University, and for the many resources included in her MOOC addressing "wicked big problems," and for the inspiration of her graduate students. Thanks to the leadership of Judy Braus and the many University of Michigan Stapp-lets over the years, especially Bora Simmons for her leadership in the development of the Climate Change Forum resources. Special thanks also to Karen Hollweg for her leadership in the development of the Project-based Online Learning Community Alliance (POLCA) resources and her collaboration with CLEAN.

Jake Foster, Massachusetts Department of Secondary and Elementary Education, and Jim Gorman, physics and chemistry high school teacher at Northbridge High School, for our original collaboration on science, technology, engineering framework strand maps. Thanks to Jake Foster for making public the original weather-climate strand map upon which the revised Massachusetts and NGSS strand maps are built. And going back further, thanks to the original strand map work done in the Atlases produced by the American Association for the Advancement of Science.

Jeanine Silversmith, President of the Rhode Island Environmental Educator Association, who sent out an early version of the cmap for comments to the RIEEA membership. Special thanks to Jennifer Collier, Buttonwood Park Zoo, for testing the original map for functionality and finding some links that did not work. Also special thanks to Kati Maginel, Save the Bay, for her suggestion to develop the solutions with links to <u>local</u> organizations to help environmental educators assist others in finding their niche for working on solutions to climate change challenges.

New England Environmental Education Association and affiliates for organizations giving solutions to climate change challenges. Many people who contributed links to organizations addressing climate change challenges in their states and cities are listed on the "Organization Contributor Acknowledgements" document linked to the "Regional Level New England" bubble.

Michele Eckman, Connecticut Audubon Society, for advise about the colors used in the concept maps.

Kim Kastens, emeritus Columbia University, for the suggestion to turn the orientation of the homepage bubbles from my original vertical orientation to a horizontal orientation, since that is the way we read.

Misty Klotz, Community Outreach Assistant, Michigan State University (MSU) for several links to the Climate Change and Agriculture Fact Sheet Series from MSU Extension.

To many who took a look at early efforts and offered their insights and encouragement: Rachel Stronach, Liz Moniz, Joseph Levine, Kathy Berube, Jeff Glick, Matthew Pottle, Don Duggan-Haas, Lauren Parmalee, Jen Klein, Ryan Morra, Rosemary Rak, Susan Quincy, and Virginia Pertillar.

Thanks to all users. May you find your way to appropriate resources to deepen your knowledge, teach others, and create cohesive programs to build the interdisciplinary

wicked big problems.		

knowledge and skills necessary to respond to the challenges of climate change and other