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Jim McCarthy’s achievements at the intersection of science with public policy

by **John P. Holdren**^{1,2}

ABSTRACT

Along with his distinguished research career as a biological oceanographer and marine biologist and his inspiring service as a teacher, advisor, and mentor to students and junior colleagues at Harvard University, Jim McCarthy has been a scientific statesman of the first order, bringing insights from his research and his deep understanding of the role of science in society into the arenas of management of scientific enterprises and public and policy-maker education about the science relating to some of the greatest challenges of our time. His roles at the intersection of science with public issues have included stints as director of the Harvard Museum of Comparative Zoology, cochair of the Working Group II (Climate Change Impacts, Adaptation, and Vulnerability) for the Third Assessment of the Intergovernmental Panel on Climate Change, president of the American Association for the Advancement of Science, chair of the Board of the Union of Concerned Scientists, chair of the Scientific Committee of the International Geosphere-Biosphere Program, vice chair of the New England Climate Impact Assessment, and member of the U.S. Arctic Research Commission, among others. In all of these roles, he has been a model of insightful leadership, selfless service, integrity, and commitment to science and the public interest.

Keywords: Biological oceanographer, marine biologist, scientific statesman, Harvard University, role of science in society, public and policy-maker education

1. Introduction

Professor McCarthy’s remarkable achievements in marine biology and biological oceanography—and as a teacher and mentor to a host of students and postdoctoral fellows who have gone on to become scientific stars in their own right—are abundantly documented elsewhere in this volume. Those achievements alone would be plenty to celebrate, as the fruit of a long and immensely productive career. However, there has been a second related but nonetheless separate career that Jim has carried off in parallel and with comparable

1. John F. Kennedy School of Government and Department of Earth and Planetary Science, Harvard University, Cambridge, MA 02138 USA; orcid: 0000-0002-9643-8060.

2. Corresponding author: *e-mail: john_holdren@hks.harvard.edu*

commitment, inspiration, insight, and influence. That parallel career, as a scientific statesman educating policy makers and the public about interrelated threats to the ocean and to Earth's climate, is the focus of this article.

McCarthy's activities at the intersection of science and public policy have been carried out in the context of an extraordinary range of positions and platforms he has occupied in parallel with his primary academic posts as Alexander Agassiz Professor of Biological Oceanography and professor of earth and planetary sciences at Harvard. These other posts include chairman of the Scientific Committee of the International Geosphere-Biosphere Program (1986–1993), cochair of Working Group II (Impacts, Adaptation, and Vulnerabilities) of the Intergovernmental Panel on Climate Change's Third Assessment (1998–2001), president and chair of the Board of the American Association for the Advancement of Science (AAAS; 2008–2010), member of the U.S. Arctic Research Commission (2012–2017), and president and chair of the Board of the Union of Concerned Scientists (UCS; 2009–2015).

In addition, McCarthy served as one of the scientific lead authors of the monumental 2004 Arctic Climate Impact Assessment (produced for the eight-nation Arctic Council that coordinates cooperation among the countries that have territory or territorial waters north of the Arctic Circle); was a scientific advisor for Al Gore's powerful and influential documentary film on climate change, *An Inconvenient Truth* (which appeared in 2006); was vice chair of the Northeast Climate Impacts Assessment organized by the UCS (appearing in 2006 and 2007 and significantly advancing the regionalization of understanding of climate change impacts); helped launch the AAAS's "What We Know Initiative" to inform policy makers and the public about climate change, then served as cochair of its scientific panel (2009–2014); and helped launch and fund the Center for Science and Democracy at the UCS (2012).

In each of these roles, McCarthy was a key participant in efforts linking the insights of cutting-edge environmental science to enhanced appreciation and understanding by policy makers and the public alike. He also was and remains an extremely effective advocate persuading other scientists to join in such efforts, which he rightly regards as part of the social responsibility of scientists—namely, to share what they know that is germane to public policy. He has excelled at the greatest challenges in such work, which are (1) to focus on issues for which science is integral to good decision making, (2) to make the relevant science understandable to laypeople while not oversimplifying it, and (3) to be clear (and thus credible) in delineating the boundary between one's science and one's policy preferences. All who have worked with McCarthy in these domains know that he has pursued these ends with immense collegiality, modesty, and humility—a team builder and team player, not a limelight seeker, his only aim being to advance the public interest.

In the remainder of this tribute, I elaborate on some the insights and stances that have characterized McCarthy's extensive work at the interface of science and policy, with the help of quotes from his own writing and interviews (and a few quotes from his colleagues).

2. Insights and stances

From the very beginning of his scientific career, McCarthy understood that many of the most fascinating problems in environmental science can neither be understood nor solved without drawing on insights from multiple disciplines. He brought that insight to bear on his own choices to work in oceanography, marine biology, and climate science, where interdisciplinarity is indispensable. He has also brought it to bear in his work at the intersection of science and public policy, where social sciences and humanities, no less than a multitude of scientific disciplines, are germane. Beyond the interdisciplinarity in his own work, McCarthy has been a highly successful evangelist for that rubric, having long used his many platforms to communicate to students, mentees, and the wider scientific community the importance of interdisciplinary approaches both within science and at its intersection with policy.

Illustrative of McCarthy's stance on interdisciplinarity is this passage from his address to the AAAS annual meeting in 2009 at the conclusion of his presidency of that organization, entitled "Reflections on Our Planet, Its Life, Origins, and Futures" (McCarthy 2009; p. 1655):

Cooperative efforts begun in the 1980s to bridge gaps among the Earth and life sciences to address interrelated components of the Earth system have led to much of the understanding that is represented in the IPCC [Intergovernmental Panel on Climate Change] assessments. Further advances in these areas need to be encouraged and enhanced with closer partnerships with engineering and social science communities. The charter of the Earth System Science Partnership reflects a substantial step in this direction. Its initiatives related to the carbon cycle, food security, water, and human health in the context of global environmental change will provide essential new understanding as society steers to a future that diminishes risk for future human well-being and life all across our planet.

That extraordinary, forward-looking presidential address for the AAAS began, though, by making an evocative connection with the past: "The occasion of this annual meeting, which opened on the very day of the 200th anniversary of the birth of Charles Darwin and President Abraham Lincoln, prompted special reflection on the significance of Darwin's contributions to our knowledge of the coevolution of organisms and their environment and the role that President Lincoln played in the advancement of science and, in particular, its application for the benefit of societal well-being" (McCarthy 2009; p. 1646). The link to Darwin provided a jumping-off point for the speech's central focus on civilization's assaults on the life-support systems of the planet:

A profound lesson from the past few decades of scientific discovery across the Earth and life sciences is that the weight of the human footprint on essential life-supporting services of the Earth system has grown dramatically since the time of Darwin. Over the past 150 years, our population has grown five-fold. Our consumption of resources

has grown even more. Greenhouse gases released today by anthropogenic activities will affect the heat budget of Earth's atmosphere for tens of human generations. ... Could Darwin have imagined that so soon in Earth history a single species would be altering the prospects for the survival of other species across all continents and to the greatest depth of the sea? (McCarthy 2009; p. 1646).

A major part of the AAAS speech provided the best compact history I have seen of how scientists from many disciplines put together, over the course of nearly two centuries, the wholly convincing story of how heat-trapping gases from fossil-fuel burning and deforestation have transformed Earth's climate with impacts on life, health, property, and ecosystems. Linking atmospheric chemistry and physics, oceanography, ecosystem science, satellite observations, the study of ancient climates, and the history of fossil-fuel burning since the dawn of the Industrial Revolution, McCarthy's account summarizes lucidly the immense, interdisciplinary, intensively peer-reviewed body of scientific evidence that leaves no reasonable doubt about what has happened and where we are heading. It is a daunting story.

McCarthy's exemplary work to understand, document, and explain the threats to human well-being from civilization's impacts on the oceans, the atmosphere, and, above all, the climate has gone hand in hand with both forceful denunciation of actors who have tried systematically to obscure the reality of the threats and eloquent pleas for appropriate action from policy makers. Illustrative of those themes was his March 2007 testimony before the Subcommittee on Investigations and Oversight of the House Science Committee in the U.S. Congress (McCarthy 2007; p. 1), in which he stated the following:

It is now clear that for a number of years, both Bush administration political appointees and a network of organizations funded by the world's largest private energy company, ExxonMobil, have sought to distort, manipulate and suppress climate science, so as to confuse the American public about the reality and urgency of the global warming problem, and thus forestall a strong policy response. ... [I]t is crucial that the best available science on climate change be disseminated to the public, through government websites, reports, and press releases. In recent years, however, this science has been increasingly tailored to reflect political goals rather than scientific fact. ... The true signal that ExxonMobil's disinformation campaign has been defeated and federal climate scientists have regained a real voice will come when Congress passes policies that meaningfully address the threat of global warming.

McCarthy hit that theme again in an opinion piece coauthored with former Colorado senator Tim Wirth in the *Huffington Post* (McCarthy and Wirth 2010): "In recent months, climate change skeptics have ramped up their efforts in the media and Congress to misrepresent the scientific consensus on global warming. They have questioned the integrity of climate researchers and claimed that reducing carbon emissions would wreck our national economy. Such tactics are meant to sow confusion and lull the public into a dangerous

complacency.” The piece went on to call for a more forceful stance not just from the scientific community but also from President Obama: “In response, scientists must communicate their research methods and findings more broadly and effectively. . . . But scientists do not have a bully pulpit. President Obama does—and the public desperately needs him to use it. . . . President Obama is uniquely qualified to cut through the fog created by misleading and manufactured controversies by telling the American public the truth. As he leads, our country will respond.” Obama (and his top science and technology officials) heeded that call, and the result was a ramping up of forceful statements from the administration on climate change and new actions to address it, including, in 2013, the sweeping Climate Action Plan.

Many of McCarthy’s calls for policy action addressed the need for adequate support for the monitoring and research needed to develop the more accurate and geographically disaggregated forecasts of future climate change that farmers, business owners, urban planners, and citizens would need in order to prepare and adapt. He noted in his 2007 testimony that “federal climate science research is at the forefront of assessing fundamental causes of global warming and the future dangers it could pose to our nation and the world. Such research is of tremendous value to many Americans planning for these risks, including coastal communities designing infrastructure for protecting against storm surges; civil authorities planning for heat waves; power companies preparing for higher peak energy demands; forest managers planning wildfire management programs; farmers adjusting to changing precipitation patterns; and policy makers evaluating energy legislation” (McCarthy 2007; p. 7). The implication was reinforced in his AAAS speech early in 2009: “Ironically, as assessments of climate-change science and climate impacts have increasingly called attention to changes in climate and documented impacts that were not evident in half a decade earlier, the Earth-observing systems on which advances in this science depend are woefully underfunded. Budgets to develop, deploy, and operate these systems and to support the scientific use of the data have not grown in proportion to the widely recognized needs for these capabilities. Worse, domestic funding to sustain them has actually declined over the past decade, even though the United States pioneered many these systems” (McCarthy 2009; p. 1650). This, too, was a theme that was embraced by the Obama administration with a serious and sustained focus on strengthening the nation’s Earth-observation systems.

Of course, optimism about the stance of the United States on climate change engendered by progress made in the Obama administration has been difficult to sustain under the headlong retreat from climate sanity orchestrated by the Trump White House. McCarthy’s observation about this in an April 2018 interview on National Public Radio on the occasion of his receipt of the Tyler Prize for Environmental Achievement was one that resonated, I think, with every serious student of the climate change challenge (Curwood 2018): “I’m extremely concerned about the loss of momentum on the extraordinary international agreement that was struck with the Paris Accord. The good news is that we’ve seen many cities and states not only express their resolve to keep working [on climate change], but even to up their game. I’m worried, though, that international resolve could be diminished without

the United States in a position of leadership.” In the same interview, though, McCarthy demonstrated the ability to find some good news in every situation—a hallmark of his work in the public policy arena over so many decades:

What more than anything else gives me hope is seeing the young people today—the college-age population—who are learning about [climate change]. And wherever they go—whether they go into the business sector or into the public sector, any position in any career—they’re carrying with them an understanding of the problem that the previous generation didn’t have. When I interact with these students, I see a passion to be involved on the solution side of [the climate change] question, and I think that’s a very hopeful indication that, as we move through this bottleneck, we will emerge much stronger on the other side. (Curwood 2018)

3. Leadership style

I think everyone who has worked with McCarthy, whether in science or at the intersection of science with public policy, would testify to his ability to lead with grace, inclusion, and humility. He does not coerce or badger, and I do not believe I have ever seen him raise his voice. He leads, rather, with deep knowledge, soft-spoken logic, and quiet persuasion.

Here are some comments from three other pillars of science and public policy community who worked closely with McCarthy in three of his leadership roles:

- “His engagement with the issues has been well informed by his many years of research, teaching, and advocacy for scientific integrity. He contributes in many ways, linking the commissioners to recent relevant research and connecting staff to appropriate experts in a variety of fields. He has prioritized climate change science and its useful application to the issues facing the people of the Arctic, including health and food security. Jim is a big-picture thinker, who focuses on the long-term future and the importance of making research processes and results clear and relevant to citizens and policy makers” (Fran Ulmer, chair of the U.S. Arctic Research Commission during McCarthy’s service as a member).
- “Jim McCarthy is the epitome of the ‘citizen scientist.’ He’s a great leader and colleague with clear commitment and remarkable skill at bringing complex science to the public and policymakers. His leadership at AAAS on a wide range of issues—above all climate change—is proof positive” (Alan Leshner, CEO of the American Association for the Advancement of Science at the time of McCarthy’s presidency and chairmanship of the board).
- “At UCS Jim had big shoes to fill, having been preceded as president and chair of the board by two giants: Henry Kendall and Kurt Gottfried. He did so admirably, with quiet, thoughtful, effective leadership. It was never about Jim, always about the organization. He never cared who got the credit” (Peter Frumhoff, director of science and policy and chief climate scientist, UCS, during McCarthy’s leadership roles there).

4. Conclusion

Scientist, teacher, mentor, institution builder and leader, and scientific statesman—Jim McCarthy has excelled in every role. It is impossible to say which of these roles he has relished the most, perhaps because he understands how they all intersect in the mission he described in the opening of his presidential address for the AAAS: “We must work toward a future that embraces the wise application of science to improve human health and well-being and to sustain the great diversity of life on our planet” (McCarthy 2009; p. 1646).

Acknowledgments. The author thanks Peter Frumhoff (UCS), Alan Leshner (AAAS), and Fran Ulmer (U.S. Arctic Research Commission) for helpful insights.

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Received: 27 March 2019; revised: 27 March 2019.