

# The Hidden Gems of U.S. Science

*EPSCoR's 1st Message Triangle for the Public*

## What's my frame? ECONOMIC

[Problem] Fiscal challenges and global competition threaten the U.S.'s premier leadership position in science—and therefore, our economy. This national problem is echoed locally, as many U.S. states win fewer patents, per capita, than the national average.

[Benefits] From supercomputers in Wyoming to Montana's optics industry; from solar power clusters in Little Rock to 28,000 life sciences jobs in Delaware, EPSCoR researchers have fueled much growth and prosperity. With your support, that will continue. Who knows where genius will strike next?

From  
Maine  
to Hawaii,  
NSF's EPSCoR  
program uncovers the hidden  
scientific gems and drives the  
breakthroughs that are crucial to our national  
competitiveness challenge.

[Solution] EPSCoR mobilizes the nation's diverse scientific resources to counter these challenges, ensuring that all of the U.S.'s research gems are unearthed, wherever they reside. Each of our 31 unique laboratories of innovation stands to drive economic improvement in its respective state.

# EPSCoR's Message Triangle # 1 (Economic)

## *talking point 1: the PROBLEM*

- [Problem] Fiscal challenges and global competition threaten the U.S.'s premier leadership position in science—and therefore, our economy. This national problem is echoed locally, as many U.S. states win fewer patents, per capita, than the national average.
  - Start with the evidence needs to convey the dimensions of the threat, including:
    - How threats to basic research funding undercut the U.S.'s scientific capabilities (research infrastructure, research capacity, future workforce, knowledge base) and thus the innovation that drives economic growth
    - How the significant emphasis on, and investments in, science by rising global powers (e.g., China and India) threaten to make an “also-ran” of U.S. scientific research and undermine our ability to exploit innovation for economic gain
  - At the same time, it is important to transition quickly from the global/national to the local, showing how individual U.S. states are also facing a competitiveness challenge:
    - Data on per capita income, state unemployment rates, and especially differentials in patents per capita can underscore how important it is spur innovation on a state-by-state level. A rising tide must lift all boats.

# EPSCoR's Message Triangle # 1 (Economic)

## *talking point 2: the SOLUTION*

- [Solution] EPSCoR mobilizes the nation's diverse scientific resources to counter these challenges, ensuring that all of the U.S.'s research gems are unearthed, wherever they reside. Each of our 31 unique laboratories of innovation stands to drive economic improvement in its respective state.
  - The evidence needs to provide the reasons to believe this solution will work, including:
    - Historical evidence of how EPSCoR research has yielded economic benefit
      - Each state will, of course, need to provide different evidence. If there is a longstanding EPSCoR program in the state, past benefits of that research should be cited. If it is a newer jurisdiction, successes in other states should be cited as a model.
    - Local evidence of your state's unique research strengths and advantages:
      - You want to prove that your state has key built-in advantages that need to be tapped, in specific areas. In other words, explain why your current research focus (or desired focus) makes sense and, ideally, could only happen in your particular state. You want to show that you've got the edge on the competition.
    - How we'll get there: increased collaboration, better networking, etc.

# EPSCoR's Message Triangle # 1 (Economic)

## *talking point 3: the BENEFITS*

- [Benefits] From supercomputers in Wyoming to Montana's optics industry; from solar power clusters in Little Rock to 28,000 life sciences jobs in Delaware, EPSCoR researchers have fueled much growth and prosperity. With your support, that will continue. Who knows where genius will strike next?
  - The evidence needs to convey a BRIGHTER VISION OF THE FUTURE
  - The goal is to impart not just what the research hopes to achieve, but what it will mean to each of us in the future
    - The economic frame requires that this vision speak to job creation and strong local economies
    - If you already have proof of economic benefit from EPSCoR research, cite it and suggest that it 's just the beginning. If not, cite projections of how many jobs/companies \*could be created\* or \*will be created\* due to a particular investment. It is crucial to be very specific. "28,000 life sciences jobs in Delaware" is the degree of specificity we are looking for.
    - End with the suggestion that there may be a new scientific gem to be unearthed right in your state, and it would be tragic to miss out on this economic opportunity. ("Who knows where genius will strike next?")

# EPSCoR's Message Triangle # 1 (Economic)

## *CALL TO ACTION*

"The United States stands at a scientific turning point—as do its united states. To rise above fiscal hurdles and match global competition, we must fire our innovation engine; but more precisely, we need to fire fifty unique engines all at once. In meeting this challenge, NSF's EPSCoR program plays a crucial role because it helps to maximize our potential by exploiting the opportunities inherent in diversity. EPSCoR answers the diversification of global science with the diversity of America, thereby ensuring that no scientific gem goes unearthed. And real tangible payoffs have already been shown--from supercomputers in Wyoming to Montana's optics industry; from solar power clusters in Little Rock to 28,000 life sciences jobs in Delaware. But that's just the beginning. There are more gems to unearth, and with your support, we'll find them together. Who knows where genius will strike next?"

# Training the Innovation Generation

## EPSCoR's 2<sup>nd</sup> Message Triangle for the Public

### What's my frame? EDUCATION

[Benefits] There can be no greater payoff than if we woo American students to fall back in love with science.

That's why we're creating an innovation generation: To help ensure the future of American science by filling the pipeline with future scientists—and future science leaders.

From  
Maine  
to Hawaii,  
NSF's EPSCoR  
program is helping to build a  
pipeline of innovators and science  
leaders, one that stretches from our  
kindergartens all the way to research labs.

[Problem] Most Americans believe science and technology hold the key to the challenges before us--alternative energies, sustainable environments, higher standards of living, and safer, thriving communities. Yet student interest in STEM careers is flagging, threatening our ability to innovate. To ensure that we have the science we need--and the Nobel Prize winners of tomorrow--we must entice a new generation of American discoverers and innovators.

[Solution] EPSCoR works to strengthen our national STEM pipeline on a state-by-state basis. We don't just show kids that science is seriously cool (though it is). We've got Rhode Island teachers bringing biotech into the classroom, Mississippi 5<sup>th</sup> graders using computer games to study bacteria, and Hawaiian high schoolers monitoring our climate—to name just a few programs.

# EPSCoR's Message Triangle # 2 (Education)

## *talking point 1: the PROBLEM*

- [Problem] Most Americans believe science and technology hold the key to the challenges before us--alternative energies, sustainable environments, higher standards of living, and safer, thriving communities. Yet student interest in STEM careers is flagging, threatening our ability to innovate. To ensure that we have the science we need--and the Nobel Prize winners of tomorrow--we must entice a new generation of American discoverers and innovators.
  - Start with the evidence needed to convey the dimensions of the threat, including:
    - Problems with K-12 science education today—student disinterest, unqualified and poorly paid teachers, a chaotic system of school boards and districts, “teaching to the test,” and so on. Choose a few choice statistics; you don’t want to spend too long here.
  - Make it vivid, using details and stories:
    - \* Perhaps use a brief anecdote from the childhood of a Nobel Prize winner or acclaimed scientist—an anecdote of when this person caught the science “bug,” perhaps thanks to a great teacher...which, in turn, led to great things.
    - \* Stories about individual students—success stories, or, if you have them, stories of students who were turned off of science by a bad education system—can be very powerful. Put a human face on the problem.

# EPSCoR's Message Triangle # 2 (Education)

## *talking point 2: the SOLUTION*

- [Solution] EPSCoR works to strengthen our national STEM pipeline on a state-by-state basis. We don't just show kids that science is seriously cool (though it is). We've got Rhode Island teachers bringing biotech into the classroom, Mississippian 5<sup>th</sup> graders using computer games to study bacteria, and Hawaiian high schoolers monitoring our climate—to name just a few programs.
  - Here is where you get to show the evidence about *\*your initiative\** and how it is actually working. And how to do that?
    - Use figures on the scale and scope of what you're attempting. How many kids have been reached? Or how many teachers?
    - Once again, make it vivid: What do these students learn from you that's unique? What do they go out into the world and do? Put us right there in a scene where learning is happening.
    - If available, provide benchmarks on the outcomes of your education initiative. Document that it is *\*working\**.

# EPSCoR's Message Triangle # 2 (Education)

## *talking point 3: the BENEFITS*

- [Benefits] There can be no greater payoff than if we woo American students to fall back in love with science. That's why we're creating an innovation generation: To help ensure the future of American science by filling the pipeline with future scientists—and future science leaders.
  - Above all, the evidence needs to convey a BRIGHTER VISION OF THE FUTURE
  - The goal is to impart not just what your STEM initiative hopes to achieve, but what it will mean to each of us in the future
    - Help us imagine a world where science regarded as is the coolest thing that kids can possibly get into. Better than sports!
    - Tell us what that will mean in terms of test scores, achievements, innovation. Be as specific as possible.
    - Consider ending with the suggestion that if we \*don't\* take up this call, the world might miss out on the contribution of a scientific genius who could have been, if only he or she hadn't been turned away from science at a young age.

# EPSCoR's Message Triangle # 2 (Education)

## *CALL TO ACTION*

"American students were enraptured by science once before, when kids raced out of school to fire off rockets into the October sky. It can be that way again. To ensure the next generation of innovation and scientific leadership—and to tend to our future Nobel Laureates—we must strengthen the science pipeline, making sure that every American student gets the same chance to fall in love with science that you and I once had. In meeting this goal, NSF's EPSCoR program plays a key role, as each of its states is pioneering STEM programs that enrich and entice our next generation of science leaders. We're helping to train the innovation generation, firing up geniuses wherever they may be found across the U.S.—the Einsteins and Darwins of tomorrow. But we're just getting started. There are so many more students we need to reach—and with your support, we can get there. The goal is nothing less than a world in which no student—no student, period—has to miss out on the wonder, and the privilege, of scientific understanding."

# Quality Science...for Quality Living

*EPSCoR's 3rd Message Triangle for the Public*

## What's my frame? Quality of Life

[Technology] From designing tiny barcodes that can protect you from counterfeit bills and fake products, to the tech innovations that sharpen student education and deepen our online experiences, EPSCoR researchers are producing quality science...for quality living.

From  
Maine  
to Hawaii,  
NSF's EPSCoR  
program funds the cutting-edge  
research that is making our lives  
healthier, safer, and more fulfilling.

[Environment] From biofuels in Nebraska to wind power in Iowa—or from the impact of climate change on Narragansett Bay to its toll on Utah's mountain snowpack--our research helps to forge cleaner and healthier environments...safer and stronger places to build communities and raise families.

[Health] From improving the wellbeing of Alaskan native elders, to using nanotechnology for diagnosing diseases and even creating better prosthetic devices, EPSCoR fuels health science innovation that makes our lives richer, longer, and more meaningful.

# EPSCoR's Message Triangle # 3 (Quality of Life)

## *talking point 1: the Environment*

- [Environment] From biofuels in Nebraska to wind power in Iowa—or from the impact of climate change on Narragansett Bay to its toll on Utah's mountain snowpack--our research helps to forge cleaner and healthier environments...safer and stronger places to build communities and raise families.
  - If environmental issues comprise your state's particular research focus—or, if you simply want to communicate about such an issue--use this talking point to develop a full problem-solution-benefits triangle, framed around improving quality of life. And how would you do that?
  - Start with the problem: How environmental degradation, or inefficient and dirty energy systems, worsen our quality of life.
  - Move on to the solution: \*your research\*! Period.
  - Close with the benefits. What's the better world we'll live in, the happier and more productive lives we'll have, because of this? Lift us up. Make us believe.

# EPSCoR's Message Triangle # 3 (Quality of Life)

## *talking point 2: Health*

- [Health] From improving the wellbeing of Alaskan native elders, to using nanotechnology for diagnosing diseases and even creating better prosthetic devices, EPSCoR fuels health science innovation that makes our lives richer, longer, and more meaningful.
  - If medical or health issues are your state's particular research focus—or, at the center of how you want to focus your message—then once again, use this talking point to develop a full problem-solution-benefits triangle. And how would you do that?
  - Start with the problem: How diseases, or one particular disease like heart disease, continue to take a dramatic human toll despite the powerful medical advancements we've seen in recent decades. And how this worsens our quality of life, certainly for the sick patients but, perhaps you could argue, more broadly.
  - Move on to the solution: *\*your research\**! Sound familiar?
  - Close with the benefits. On medical issues in particular, be sure not to overpromise—but show us how *\*promising\** your work is, and paint a picture of the happier, more productive lives some of us will have if you succeed.

# EPSCoR's Message Triangle # 3 (Quality of Life)

## *talking point 3: Technology*

- [Technology] From designing tiny barcodes that can protect you from counterfeit bills and fake products, to the tech innovations that sharpen student education and deepen our online experiences, EPSCoR researchers are producing quality science...for quality living.
  - Finally, if technology development is at the center of what you want to communicate, then draw on this talking point to develop a full problem-solution-benefits triangle. And how would you do that? (You're an old pro by now.)
  - Start with the problem: How cumbersome or laborious it is that two particular apps still won't work together, for instance. Or all the lost work hours and productivity that we see because of a particular technological problem.
  - Move on to the solution: \*your research\*! Yes, you knew that already.
  - Close with the benefits. Better world....

# EPSCoR's Message Triangle # 3 (Quality of Life)

## CALL TO ACTION

"Over the course of the twentieth century and into the twenty-first, our standard of living—and frankly, the *quality* of human existence itself—improved dramatically. We live longer and healthier than we used to, thanks to vast improvements in public health and medicine--and thank goodness for that, because parallel advancements in other arenas, like technology, mean that the possibilities that the world offers today are just...stunning. But is it enough?

We still still faces environmental and energy problems that shorten lives and, writ large, threaten the bedrock of how our society is built and operates. Meanwhile, millions of us are still succumbing to painful diseases like cancer and heart disease before reaching comfortable old age....sometimes, before we even get to meet our grandchildren. The project of building a better world didn't end—it continues, and science remains the best and only way forward.

That's what EPSCoR is all about. Our environmental and energy research; our health innovations, particularly drawing on nanotechnology; and our technological insights are part of this grand scientific pageant of making your world better, one study at a time. We don't do it just because we dig the knowledge--quality science is great in and of itself, but even better still when the goal is something that we all value above anything else: quality living."