

Compounding Catastrophe: The Impact of Humans on Natural Disasters ■ **Coastal Erosion and the Threat to Kivalina Alaska** ■ **Mining and the Destruction of Baia Mare** ■ **Angels of Mercy:** The United States Navy ■ **Sustainable Solutions** Stripping Stain with Corncobs ■ **Building Smart** A Living Systems Approach to Design ■ **Living Green** Changing Lives for the Better ■ **Corporate Commitment** Leading in a Time of Change ■ **Personal Perspective** Heeding History's Message in Southwest Alaska ■ **Earth View** The Need to Extend Protection to the Imperiled Polar Bear ■ **Katrina, The Corps and Change** ■ **Worth Considering**

livebetter

July • August 2008 volume 2 • number 3



Lewis E. (Ed) Link, Ph.D.

Katrina and the IPET

Understanding the Truth Behind the Tragedy



KUHNS BROS. LOG HOMES

SUSTAINING OUR FUTURE... TODAY.



A log home is a true sustainable and environmentally-friendly choice for new construction – designed, constructed and operated to boost environmental, economic, health and personal performance. In fact, these resource-efficient, environmentally-sound and healthy homes reduce waste, save energy, improve indoor air quality and mood while offering a healthier and more satisfying living environment.

Just a few sound reasons to choose solid log construction:

- Solid log components consume less energy and labor between harvest and placement on the housing site.
- "Surface-as-finish" savings are significant. Solid log walls eliminate the need for building material layers while fully utilizing the value of timber, the only renewable construction material on earth.
- Log homes provide the benefits of thermal mass – using log walls' heat-retention capacity to reduce annual heating and cooling energy demands.
- Log homes may be expected to perform from 2.5 percent to more than 15 percent more energy efficiently compared to identical wood-frame houses.

Kuhns Bros.' commitment to each other and to our environment is important to us. We do everything we can to preserve the quality of life for future generations. We all depend on it.

REMEMBER . . . ONE FAMILY, ONE EARTH.
BE PART OF IT.



www.kuhnsbros.com
1.800.326.9614



www.countrylogcabins.com
1.800.326.9614



LIVING WITH WOOD AND SURROUNDED BY WOOD

brings us back into harmony with nature,
which is one reason why more and more people are choosing to build log homes.





livebetter

July • August 2008 volume 2 • number 3

cover story

Katrina and the IPET:

Understanding the Truth Behind the Tragedy 22

features

30 Katrina, The Corps and Change

34 Compounding Catastrophe: The Impact of Humans on Natural Disasters

40 Angels of Mercy: The United States Navy

48 Mining and the Destruction of Baia Mare

54 Coastal Erosion and the Threat to Kivalina, Alaska

departments

- 10 Living Green
- 18 Building Smart
- 60 Worth Considering
- 63 Sustainable Solutions

columns

- 4 Publisher's Comments
- 8 Corporate Commitment
- 14 Earth View
- 64 Personal Perspective



34



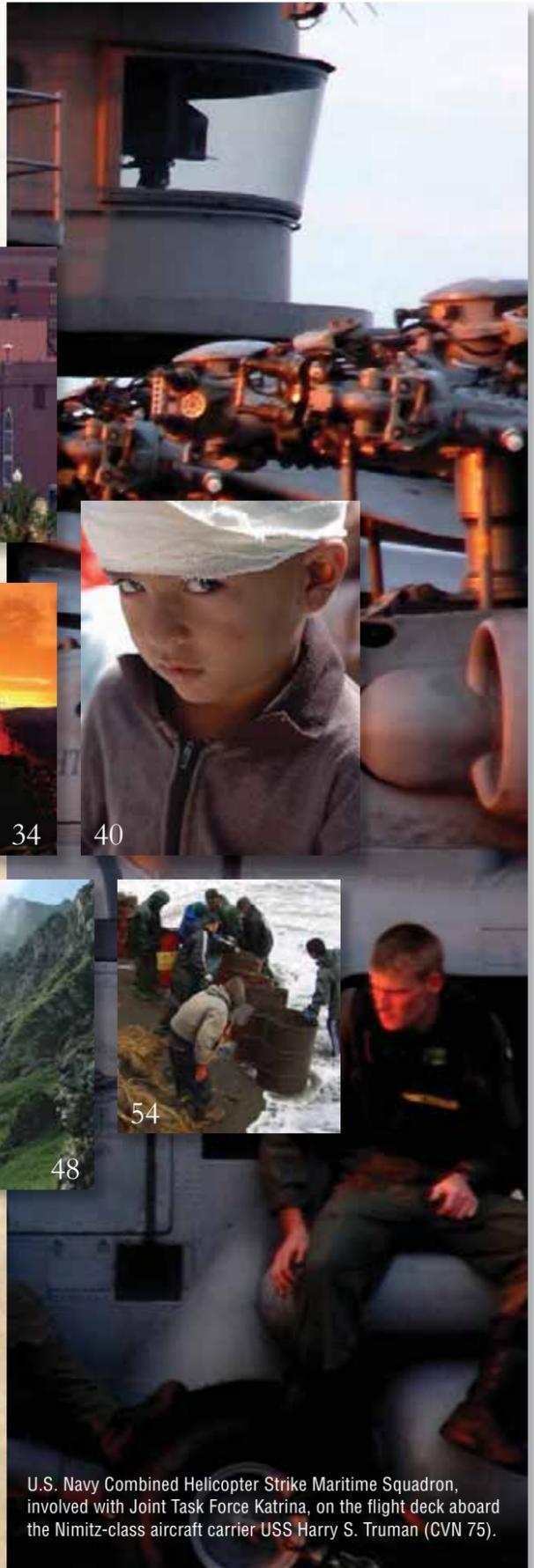
40



48



54



U.S. Navy Combined Helicopter Strike Maritime Squadron, involved with Joint Task Force Katrina, on the flight deck aboard the Nimitz-class aircraft carrier USS Harry S. Truman (CVN 75).

The True Price of Consumerism

One day not long ago, I was working in my home office on a rural West Virginia mountain when I had an epiphany or “light bulb moment,” thanks to revising Leah Cunningham’s Baia Mare feature (p. 48 of this issue). For some reason, I’d never thought about the impact of gold mines on local people and their communities. Maybe it’s because I didn’t truly understand the consequences. Of course, *livebetter* has run two feature articles in two different issues to spotlight the proposed Bristol Bay open-pit cyanide-leach mine in the pristine Southwest Alaska region. But I was apparently more wired into the potentially disastrous environmental impacts of mining than into its devastating side effects on individuals.

I’d never thought about protesting by not buying gold jewelry or, at the very least, by not buying “dirty gold,” which is the product of gold mined in an unsustainable manner. Earth Works (www.earthworksaction.org) is currently educating both consumers and jewelers about the link between this type of hardrock mining and environmental, social justice and human rights issues (www.nodirtygold.org). According to the Environmental Protection Agency, “. . . hardrock mining is the number one toxic polluter in the United States and has polluted 40 percent of the stream reaches of the headwaters of western watersheds.” And, sadly enough, we’re not even polluting the United States for our own material benefit. The U.S. Geological Survey points out that, as of 2002, “. . . nine of the top ten producing gold mines in the United States are foreign-owned.”

Mining is, arguably, an important industry. But it’s definitely not more important than people’s health and welfare, which is why we need to understand the true impact of what we consume and require more sustainable approaches. To do less makes us just as culpable for the outcome. Take, for example, coal mining in Appalachia – mountaintop removal, in particular. Anyone living in West Virginia intimately understands the environmental and social consequences of “valley fills,” which result from the horrid practice of dumping excess rock and dirt into nearby streams after a crew blasts the top off a beautiful mountain. This approach not only destroys streams but all life within them. People living south of me suffer this daily devastation so consumers in the Washington, D.C. area can continue to “keep their lights on” along with their air conditioners, their ipods, their video games and their . . . In addition, many people in “my part of the woods” have their sole water source – well water – destroyed by such blasting. They even watch what used to be clean, clear, pure water turn into orange juice- or chili-looking crud that no one could possibly drink.

Think about the children in Baia Mare and Rosia Montana. Then think about the children in Appalachia and in other parts of the country and world. Is destroying people’s lives worth material nonsense? Some “things” we actually do need. Yet we may be spoiled. We all know that most “things” are not essential for a quality life. When we work 12-hour or longer days 5-7 days a week while trying to make ends meet, we eventually recognize a life so full of stress that we want to, as my husband would say, “commit sideways.” We don’t yearn for more “stuff” when we finally get some free time. We yearn for a chance to sit in a peaceful place and to breathe fresh air, to work in our yards, to walk in the woods, to watch the hawks and eagles glide high in the sky, or to fish in a pristine lake or stream. If we don’t come to terms with our consumerism, we won’t have anything of value left – not for ourselves, not for our children and definitely not for the eagles in the sky or the fish in the streams.

Rosemarie Calvert
Independence, WV

P.S. – Want to receive every issue of *livebetter* magazine? Become a paid subscriber and help us grow. See pages 16-17 for more details.



© iStockphoto.com/Janice

*If we don't come to terms
with our consumerism,
we won't have anything
of value left...*

ONE BILLION POUNDS OF IT.

TAKE IT BACK. MAKE IT BETTER.

What is IT? Old carpet.

We are the Carpet America Recovery Effort (CARE). A voluntary program of the nation’s carpet manufacturers, CARE finds innovative ways to keep old carpet out of landfills and get it into new products.

It’s a fact, since 2002 CARE has helped keep over ONE billion pounds of post-consumer carpet from simply being thrown away through recycling and reuse of this valuable recovered material. And we have more than just facts, we also have ideas.

What kind of ideas? You’ll find post-consumer carpet in every-thing from synthetic hay bales to highway abatement systems to car parts – it’s even being used to create energy.

We are making a vital contribution to the environment. What can you do with ONE billion pounds of old carpet? Almost anything, just don’t throw it away.

Learn more, visit our website www.carpetrecovery.org





WOOLRICH®

EST. 1830

For more than 175 years Woolrich has offered products inspired by the outdoors and designed for your life. To see our complete line of apparel for men and women, blankets, furniture and accessories, visit us online at www.woolrich.com. Call 1-800-966-5372 to request a free Woolrich mail-order catalog.

Designed for your life.



livebetter

the official magazine of the Center for a Better Life
www.centerforabetterlife.com

Cover Photo - Bill Simone
Cover Design - Rick Wattai

In Memoriam

livebetter is dedicated to John G. Colson, who passed away from lymphoma in 2007. He was not only a consummate publisher but also a good friend. Without his enthusiasm, guidance and support this magazine might not have been possible.

Center for a Better Life

Rosemarie Calvert
President

rcalvert@centerforabetterlife.com

John C. Gordon, Ph.D.
Forestry & Environmental Advisor

Robert Glenn Ketchum
Editorial & Advocacy Advisor

Sherry A. Cunningham, C.P.A.
Business Advisor

Bader Giggensch
Legal Counsel

Rick Wattai
Creative Director

rwattai@centerforabetterlife.com

Bill Simone
Director of Photography

Steve Fabian
Interactive Director

sfabian@centerforabetterlife.com

Eduardo Rodriguez
International Markets Manager

erodriguez@centerforabetterlife.com

Sebastian Bleich
German Translator

Yarianni Bustamante
Spanish Translator

livebetter

magazine

Rosemarie Calvert
Publisher & Editorial Director

rcalvert@centerforabetterlife.com

Michael Dorsch
Assistant to the Publisher

mdorsch@centerforabetterlife.com

Pamela Yagle
Editor-in-Chief

Graciela Sagrada
Senior Editor

Leah Cunningham
Assistant Editor

lcunningham@centerforabetterlife.com

Barbara Bein, Zafar Nomani,
Eduardo Rodriguez, Vanessa de Vale
Writers

editorial@centerforabetterlife.com

Laura Cheatwood, Valerie Phillips,
Karen Scott, Kelly Wittenberger
Editorial & Research Assistants

editorial@centerforabetterlife.com

Robert Wood
Senior Designer

rwood@centerforabetterlife.com

Jerry Bullock
Circulation & Subscription Assistant

Editorial: 304-892-3811 • Fax 304-892-3883

Advertising: 304-892-3811 • Fax 304-892-3883

Subscriptions: 304-892-3811

Printed in the U.S.A. *livebetter*, the magazine dedicated to sustainable living, invites the widest expression of opinion and participation. Material in *livebetter* is protected by copyright. It may, however, be photocopied for educational purposes without permission, with appropriate credit. Copyright © 2008 Forest Partners, LLC.

SUBSCRIPTIONS: U.S.: \$12/year, Students: \$8/year. Seniors: \$8/year. Government: \$8/year. Military: \$8/year. For foreign subscriptions please call 1-304-892-3811 or email rcalvert@centerforabetterlife.com for more information. Send U.S. funds to *livebetter*, P.O. Box 247, Newburg, WV 26410 or log onto our website at www.centerforabetterlife.com to subscribe via the internet.

Forest Partners, LLC
Center for a Better Life Fdn., Inc. • Live Better
P.O. Box 247 • Newburg, WV 26410
Phone: 304-368-7936 • Fax: 304-892-3883
Email: rcalvert@centerforabetterlife.com



Below is a partial list of some really great human beings who have been kind enough to share their time, energy and enthusiasm with us in an effort to promote the importance of sustainability.

1. U.S. Representative Jay Inslee, D-Washington, member of the House Select Committee on Energy Independence and Global Warming, the House Natural Resources Committee and the House Energy and Commerce Committee
2. Professor Vincent Gaffney, Chair in Landscape Archeology and Geomatics, University of Birmingham, The Institute of Archaeology and Antiquity, Edgbaston Birmingham, United Kingdom
3. Alex Beehler, Asst. Deputy Under Secretary of Defense, Environment, Safety & Occupational Health
4. Randy Goble, Vice President, Falcon Waterfree Technologies
5. Vice Admiral Michael Loose, Deputy Chief of Naval Operations for Fleet Readiness & Logistics, U.S. Navy
6. Rear Admiral Michael LeFever, Department of the Navy
7. Dr. Ed Link, Ph.D., Senior Research Engineer, University of Maryland, Department of Civil & Environmental Engineering
8. Major General Don Riley, Deputy Chief of Engineers and Deputy Commanding General, U.S. Army Corps of Engineers
9. Frank Hurd, Vice President and Chief Operating Officer, the Carpet and Rug Institute
10. Major General Del Eulberg, U.S. Air Force Civil Engineer
11. Mark Rey, Under Secretary, Natural Resources and Environment, U.S. Department of Agriculture
12. Gary Morishima and Don Motanic, Intertribal Timber Council (a consortium of over 60 American Indian Tribes and Alaska Native Corporations)
13. Lieutenant General Carl Strock, retired, former Commander-in-Chief, U.S. Army Corps of Engineers
14. Captain Edward Rau, U.S. Public Health Service, Environmental Health Officer, National Institutes of Health
15. Rear Admiral Larry Rice, Office of the Chief of Naval Operations, Director, Environmental Readiness Division
16. The Kuhns Family, owners of Kuhn Bros. Log Homes and Country Log Cabins
17. Lloyd Timberlake, Director North American Office, World Business Council for Sustainable Development
18. Major General E. Gray Payne, ADC I&L (Facilities), Headquarters Marine Corps
19. Timothy Joseph, Director, Woolrich
20. Lieutenant General Robert Van Antwerp, Chief of Engineers and Commanding General, U.S. Army Corps of Engineers
21. Rear Admiral Wayne "Greg" Shear, Chief of Civil Engineers and Commander, Naval Facilities Engineering Command (NAVFAC); President, Society of American Military Engineers (SAME)
22. Tim Troll, Executive Director, Nushagak-Mulchatna/Wood-Tikchik Land Trust
23. Joe Porrovecchio, Vice Chair, U.S. Green Building Council N.J. Chapter, SAME Fellow

Thank you for caring deeply about the world, humanity, the environment and its many inhabitants.



Leading in a Time of Change

By Abigail Kimbell
Chief Forester, U.S. Forest Service

If desks could talk, I know one that would have great stories to share. It's a wonderful wooden desk, solid and big, with seven drawers. In 1905 a man named Gifford Pinchot sat at this desk to discuss the importance of conserving the nation's forests for the greatest good and the greatest number in the long run. "Without natural resources life itself is impossible," he later wrote. "From birth to death natural resources, transformed for human use, feed, clothe, shelter and transport us. Upon them we depend for every material necessity, comfort, convenience and protection in our lives. Without abundant resources prosperity is out of reach."

Gifford Pinchot was the founder and first Chief of the U.S. Forest Service. During the five years he occupied this desk, he popularized the notion of conservation and made it a national goal. Following his legacy the Forest Service continues to carry out its mission: to sustain the health, diversity and productivity of the nation's forests and grasslands to meet the needs of present and future generations. Our motto "Caring for the land, serving people" lends purpose to every program, every plan, every partner we engage.

Since 1905 fifteen chiefs have led the agency from Pinchot's desk. In January 2007 I became the sixteenth. Our mission hasn't changed.

What is changing is our customer base, the American public—the people we serve and their needs, their values, their expectations. The population is growing; it's becoming more diverse, more consumptive, more technocentric, more global and increasingly more removed from nature. And we've moved into a new century with a set of conservation challenges that together seem unprecedented in their magnitude, their frequency, their intensity—climate change, land use conversion, biodiversity loss, freshwater scarcity, energy shortages, the frequency of floods and fires, a growing disconnect between urban and rural populations . . . ; the list goes on. The Forest Service mission is more critical than ever; for healthy, productive forests are essential ingredients to a healthy and whole population.

Our focus at the Forest Service is on restoring and sustaining the ability of ecosystems to furnish the services that people want and need. Our restoration work brings us to damaged salmon and trout streams, to upland meadows and tallgrass prairies, to rangelands choked by invasive weeds, to wetlands along streams and lakes, to degraded pine and oak savannas and woodlands, and everywhere in between. Where

ecosystems are in trouble, our goal is to restore them to health so that they are better able to adapt to change. As a science-based organization, we rely on our forest and rangeland research to inform our decision-making and management—research that began a hundred years ago with the establishment of the first experimental watershed.

But the Forest Service's commitment to care for the land extends beyond the 193 million acres we call "the national forests." Our work touches all forested lands in the United States, a mixed public-private landscape that extends from the wilderness areas of Alaska to the neighborhood trees in downtown Atlanta. Almost 60 percent of the nation's forests—about 429 million acres—are privately owned. The people who own and manage these lands serve as stewards of the countless benefits these forests provide to all of society—ecosystem

services like clean air and water, flood and climate control, wildlife habitat and scenic views. We work with state agencies and a wide array of partners to bring scientific and technical knowledge to these landowners to help them manage and protect their land. And we work internationally by providing technical assistance to other countries and

by engaging in forestry dialogues across the globe.

I became chief of the Forest Service at a time when the nation was acknowledging and accepting the fact that the world is in a period of climate change. The facts of climate change and its implications for forest management and for society are becoming increasingly clear, due in large part to the scientists who shared the Nobel Prize; some of them are our own. Responding to these challenges is one of the most urgent tasks facing us as an agency. We are already witness to its impact across landscapes, and we expect the effects to become even more pronounced with time.

I believe history will judge the leaders of our age by how well we respond to climate change. And so the Forest Service is engaging our employees at all levels and our partners in a shared effort to ensure the sustainability of the nation's forests, public and private. We will need to build climate change into everything we do. Innovation and adaptive management will be fundamental to our work on the national forests, for today we manage in an era of uncertainty, when we are less able to look to past patterns and processes as a reference. Research will help us add tools to our toolbox as scientists work hand-in-hand with land managers to learn by experimentation, to take risks and to tailor the science to changing needs. Restoration projects on public land will provide new information for private land—projects that demonstrate the value of clean water, carbon sequestration and other critical services that forests provide; projects that establish the key role of forests in climate change mitigation; projects that help advance markets for these services and, in so doing, compensate private landowners for being good stewards of the land.

And we will continue to turn a critical eye to our day-to-day operations by looking for every opportunity to reduce our own impact and to conserve our own resources. For success in sustainability can be achieved only by partnering a conservation ethic with a consumption ethic.

The Forest Service doesn't do anything alone. Our conservation ethic rests on the principle of collaborative, community-based stewardship, which is a civic responsibility that must be shared; everyone needs to be a partner in conservation. While we seek community engagement at the local level, success requires business leadership at the corporate level. One of our most important roles is to inform the public by connecting people to the natural resources they use every day and by engaging everyone in an awareness of conservation challenges like climate change. We will need to continue to reach children, our future voters and

I believe history will judge the leaders of our age by how well we respond to climate change. And so the Forest Service is engaging our employees at all levels and our partners in a shared effort to ensure the sustainability of the nation's forests, public and private.

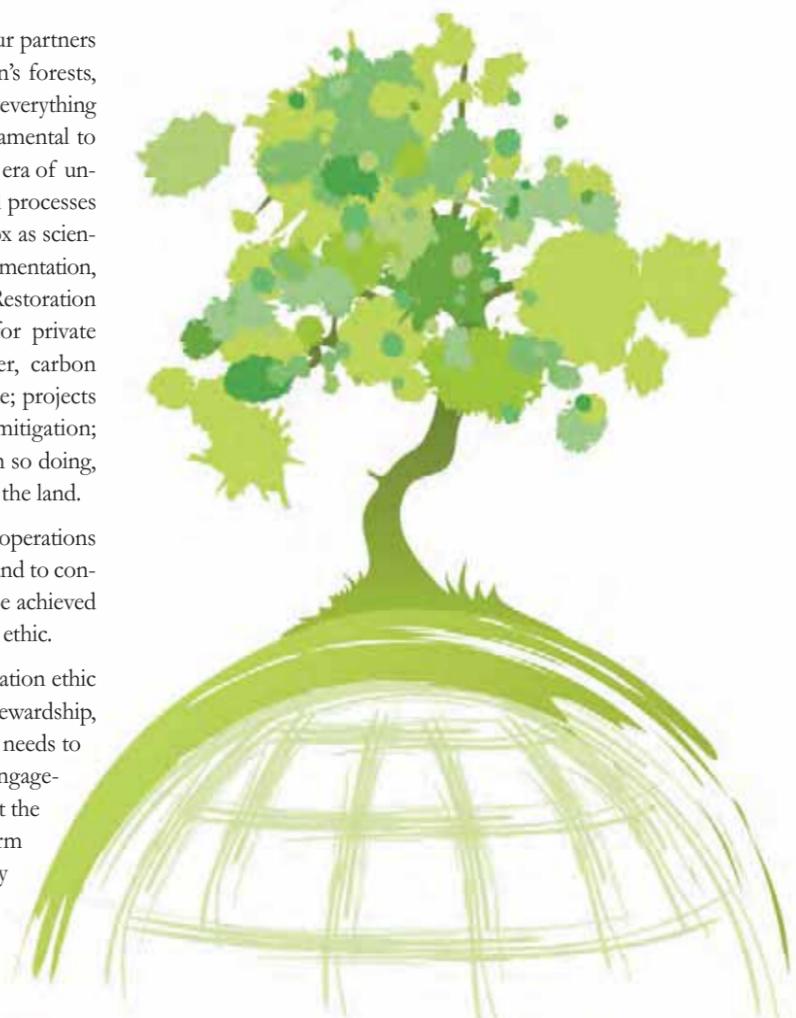
decision makers. We all have an obligation to inspire kids to embrace a responsibility to nature and to understand how their actions, and inaction, matter. We need them to be the next generation of environmental stewards.

The hurdles before us in this era of global change may seem insurmountable, but I don't think so. As we enter our second century of service, our mission becomes clearer. We have more purpose. And we will continue to care for the land by connecting people to the outdoors and to the wonders of nature. 🌿

Log onto www.centerforabetterlife.com. Become a member; it's free. Be an advocate, and support sustainability.



"Caring for the land, serving people" lends purpose to every program, every plan, every partner we engage.



Changing Lives for the Better

By Larry Edward Penley
President, Colorado State University

Worldwide, an estimated 1.6 million people die each year from health problems brought on by toxic air in their homes as they cook family meals over primitive stoves and open pit fires. Millions more suffer health problems – and even death – from vehicle exhaust or tainted water, particularly in underdeveloped countries. And yet, our nation’s research universities have not fully realized their power to change lives for the better. I came to this awareness early in my tenure as president of Colorado State University (CSU), an institution with an impressive research record in nearly every field that touches upon the dilemma called “global sustainability” – from climate change to soil science to human nutrition. Our investigative studies, I realized, were well-aligned with the greatest human and environmental challenges facing our planet. But what was missing were effective systems and processes for moving research solutions out of the laboratory and into the hands – and homes – of people whose lives could be transformed. Our academic programs were not maximizing their capacity to prepare students for life and for work in a world where global sustainability will increasingly be a concern of all countries and people.



© William A. Connor/CSU

Inspired by faculty members like Bryan Willson – whose groundbreaking clean engine technology is now helping Filipino taxi drivers earn a living wage – and Barry Beaty – who is on the front lines of fighting infectious disease in the developing world, I challenged our University to do better. The result: a pioneering approach that focuses on successfully deploying research solutions in ways that are affordable, practical and immediately impactful in the fight for global health and well-being.

Global sustainability problems are far-reaching and multifaceted; they encompass environmental responsibility, the need to support healthy people and communities, as well as a healthy planet. Through deployment of ground-breaking research solutions and education of a “green collar” workforce, research universities can have a significant and lasting impact. But as we’ve learned at Colorado State University, to do so requires that we shift our emphasis away from a campus focus to a societal focus and then that we take a broader, more business-oriented approach to “sustainability” than we have before.

It’s Not Enough To Change Light Bulbs

Concerned individuals and families routinely adopt lifestyle changes to live in greater harmony with the environment, and organizations clearly must do the same. This is particularly true for large, complex institutions like universities that operate massive physical plants and that employ thousands of people. But no matter how many energy-efficient light bulbs we install on our campuses – no matter how sustainable we make our own operations, these modifications alone will not have the major global impact needed to improve people’s lives nor make a difference throughout the world.

Don’t misunderstand: Sustainability efforts on campus are as important as they are for any business or organization. My own institution, Colorado State University in Fort Collins, has long been a leader in campus-based “green” efforts. Our university’s steam turbine generator reduces our CO2 emissions by more than 5.2 million pounds a year. Since 1990 water use on our campus has decreased 22 percent or 180 million gallons. Ours was one of the first universities to offer on-campus residents the option to purchase wind power, and we’re in the process of building a wind farm that will generate more power than the University consumes. Used cooking oil from our dining centers is collected and recycled to create biodiesel. A wetland we’ve constructed on CSU grounds removes pollutants and sediments from water that drains from the campus greenhouse. Our Forest Service nursery produces 2 million seedling trees each year and thereby reduces atmospheric carbon dioxide. All our vending machines are designed to be energy-efficient and decrease carbon dioxide emissions by more than 230,000 pounds



© John Estelle/CSU

Colorado State was “green” before “green” was trendy, and it has been home to environmental science world leaders for decades.

per year. And, thanks to our students’ commitment, we just earned second place in the annual U.S. RecycleMania competition.

But such activities, by this point, should be a routine part of doing business responsibly at any large organization. Institutions of higher learning can do so much more. Universities are society’s greatest idea and innovation sources so they should generate fundamental solutions for problems such as climate change while preparing a skilled workforce for anticipated green-industry job demands over the next several decades. To fulfill this goal, universities must be organized so that they have the potential to contribute to economic growth; and the products of their science and engineering research must be commercialized for the greater good. University presidents, in turn, have an obligation to organize their institutions to increase the inherent ability to educate and to develop new ideas and technologies. That is why I have been traveling around the country this year to speak with industry leaders, as well as fellow educators, about Colorado State’s innovative approach to confronting the global sustainability challenge and the need for universities to play a more aggressive role in addressing its different aspects.

A New Approach

Colorado State was “green” before “green” was trendy, and it has been home to environmental science world leaders for decades. Our scientists built the world’s first engineered solar-heated and cooled building. We created the nation’s first emissions control center. Our faculty led the most prominent, independent engines research laboratory in North America. And these are only a few examples of our involvement; an initial summary compiled by my office was more than 40 pages long.

But today’s elevated national consciousness – our heightened awareness of the virtue in “going green” – creates an environment conducive to expanding these efforts. For that reason Colorado State University has adopted a clear philosophy: Take great research ideas; narrowly focus upon specific areas – such as the problem of carbon-emitting two-stroke engines in Asia – and move them rapidly into the marketplace.

Envirofit International, a CSU spinoff company, provides a powerful example: It is developing what The New York Times calls “the first market-based model for clean-burning wood stove technology” in the developing world and has built a corporate infrastructure to support this model. AVA Solar, a spinoff of CSU Professor W.S. Sampath’s work, is about to begin mass production of solar panels that could cost roughly the same as power from the traditional electrical grid. These projects represent just a few ways that our faculty members are addressing environmental challenges beyond our campus; undergraduate and graduate students are involved in each one.

To support innovative projects like these and to ensure they advance quickly from the laboratory to the real world, we have devised a new method of moving technology to market; it’s called the “Supercluster.” Pairing a multidisciplinary academic research infrastructure with a market-driven business enterprise, “Superclusters” cut through bureaucratic red tape that too often prevents collaboration between universities and the business world. The structure also ensures that faculty members retain some control over how their inventions are deployed while recognizing that successful deployment requires business and investment experts’ working in partnership with research faculty toward a common goal.

The “Supercluster” organization is designed to channel innovative faculty ideas into practical, affordable solutions to global challenges; in the process quality of life improves, and economic prosperity is promoted. Professors Willson’s and Beaty’s work provide excellent examples. To fight infectious diseases like dengue fever, Beaty and his colleagues are devising new types of insecticide-treated mosquito netting that will keep people from becoming infected in their homes. Willson recognized that a single two-stroke engine can generate as much pollution as 50 conventional automobiles so he and his laboratory assistants have designed a simple retrofit for two-stroke engines to make them more efficient and less polluting. For a taxi driver in the Philippines making only \$3-5 a day, this retrofit and the resulting energy efficiency mean a big cost savings and more income to feed one’s family.

These types of simple, pragmatic outcomes – grounded in our most advanced science – can save lives worldwide, and Colorado State’s “Supercluster” model provides a dynamic new approach for getting such solutions into the hands of those who need them. In pursuing the “Supercluster” model, we’ve acknowledged that the heart of a great university today is not focused on only teaching, learning and knowledge generation but on the institution’s capacity to take that knowledge and to commercialize it for the greater good by using either a for-profit or not-for-profit enterprise-based business model.

The Green Collar Workforce

Research activities that form the basis of our “Supercluster” model involve students, both undergraduate and graduate; these scholars are gaining knowledge and skills that will position them to become competitive in tomorrow’s workforce. Universities are only now awakening to the emerging workforce needs – from green-building

architects to wind-energy engineers – that our campuses will be called upon to help fill in the coming decades. Studies suggest that the renewable energy industry could create 40 million new U.S. jobs by the year 2030. A recent draft document by the United Nations Environmental Programme notes that, in the United States, the environmental industry generated 10 times more jobs in 2005 than the pharmaceutical industry did. With programs focused upon environmental sustainability and with climate change integrated across the curriculum, Colorado State students are well prepared to be strategically competitive in meeting the surging needs for a highly skilled green-collar workforce. To continue to satisfy this demand will require that we go beyond building sustainability into curricula and that we adopt new educational programs tailored to the demands of this new economy.

At Colorado State we’ve recognized that it’s not enough to change light bulbs in our campus buildings. We ought to

focus, instead, upon engineering a better light bulb and upon educating leaders who will invent a replacement for the light bulb. Through research and education, universities like Colorado State can transform lives by generating jobs, by improving health and living conditions for people worldwide, and by stimulating economic prosperity. Those institutions able to incubate innovation and to accelerate the transfer of laboratory research to the free market will succeed in solving global problems. And schools that prepare graduates for work and for service in the emerging “green” economy are planting seeds of solutions for generations to come. While universities must be environmentally responsible as we run our organizations, the greater challenge now is to focus capacity upon more enterprise-based solutions and upon education that will truly make a global difference. 🌱

Log onto www.centerforabetterlife.com. Become a member; it’s free. Be an advocate, and support sustainability.



© William A. Cotton/CSU

We are re-envisioning civic action as a part of sustainable building.

We are redefining our relationship to the environment and to one another.

We are revitalizing our city with a green master plan.

We are refusing to compromise the health of one living system to benefit another.

We are replacing talk with action.

We are creating “green collar” jobs.

We are reimagining buildings as living organisms.

We are making “green” affordable.

We are creating restorative buildings.

We are going to build a million green homes.

REVOLUTIONARY GREEN

GREEN BUILD
INTERNATIONAL CONFERENCE AND EXPO

BOSTON, NOVEMBER 19-21, 2008
REGISTER TODAY AT
WWW.GREENBUILDEXPO.ORG

With keynote speakers **Desmond Tutu, E.O. Wilson, Janine Benyus**

The Need to Extend Protection to the Imperiled Polar Bear

By U.S. Representative Jay Inslee and Cindy Shogan, Executive Director, Alaska Wilderness League

Polar bears occupy a special place in people's hearts around the world. These exceptional animals are icons of the wilderness as well as symbols of majestic places where Earth's oldest life cycles still continue.

Over thousands of years these amazing creatures have adapted to a lifestyle reliant upon ice. From the pads of their feet, where tiny "suction cups" have evolved to ensure a foothold on the slippery cold surface, to their dietary dependence upon ice-dwelling seals, the mammoth bears have become one with an environment unequaled in ruggedness and beauty. These mammals rest, breed and sometimes even give birth on the Arctic Sea ice off the coasts of Alaska, Canada, Greenland and Russia. They even hunt their food of choice – ringed and bearded seals – from the sea ice, waiting for the seals to come up for a breath. Polar bears also use sea ice to move between offshore feeding areas and denning sites on land. But the sea ice is quite literally melting from beneath the bears' feet.

Global warming effects are visible at a colossal rate in the far-north's Arctic Seas. In fact, the Arctic Ice Cap shrunk approximately 10 percent per decade between 1979 and 2007, an astonishing loss of 28,000 square miles per year. This decrease in sea ice has jeopardized America's polar bears living in Alaska's Chukchi and Beaufort Seas – also known as the "Polar Bear Seas" – because one-fifth of the world's polar bears call them "home."

Scientists currently report unprecedented problems with polar bears in Alaska's Beaufort Sea. The U.S. Geological Survey (USGS), sole science agency for the U.S. Department of the Interior (DOI), recently sent researchers to study Alaska's polar bear



population. Alarmingly, the investigators found very few cubs and an enormous gap in the sea ice, which "eliminates a lot of the really important foraging area for polar bears," said Steve Amstrup, a USGS wildlife research biologist and Ph.D. who has been studying polar bears in Alaska's Arctic for nearly 30 years. Of the 57 polar bears he has thus far tagged in spring 2008, only one has been a yearling – a cub born last year. Amstrup believes this low statistic illustrates that fewer cubs are surviving as the sea ice, a critical location for the bears' food source, shrinks. It's clear that human actions have placed the great animal in danger; we now must work to save the increasingly imperiled polar bear from an untimely demise.

Spurred by legal action, the DOI began considering the polar bear as a possibly threatened animal under the Endangered Species Act (ESA) in January 2007. Under the law the federal department had one year to collect comments about this proposal and to decide whether the polar bear truly is a threatened species. Comments poured in at a record rate – 670,000 letters, faxes, postcards and e-mails. In September 2007, USGS scientists reported: "Future reduction of sea ice in the Arctic could result in a loss of two-thirds of the world's polar bear population within 50 years." Pressure built as the January 2008 DOI decision deadline approached. American newspapers were editorializing in favor of the bear's being protected; school-children were sending pleas to save the magnificent animal; and Congress was drafting legislation to address the causes and impact of global climate change.

But the January 2008 deadline for action came and went. Instead of meeting its legal requirement to decide the polar bear's fate, the

DOI moved to open up the animal's habitat to massive new oil and gas operations. In February 2008 the Department offered nearly 30 million acres of the bear's prime habitat in the Chukchi Sea for lease to oil companies. Not only is this unspoiled, pristine water home to scores of polar bears, but it also provides the essential habitat for walrus, whales, ice seals and a host of other species. Instead of protecting this area to help sustain the bear as well as other endangered wildlife, the DOI acted to turn these ecologically sensitive seas into a boomtown for oil and gas operators.

Risk to the Polar Bear Seas from oil and gas drilling has been documented, ironically, by the Department of the Interior. The Department's Minerals Management Service (MMS) estimated a whopping 33 to 51 percent chance of a large oil spill in the Chukchi Sea if drilling operations were approved. Despite this risk MMS went ahead and sold more than \$2 billion worth of oil and gas leases to Shell and to other oil companies.

The U.S. Fish and Wildlife Service (USFWS), a DOI agency, recently said that the potential for oil spills and the subsequent impact on polar bears are major concerns. The agency's worries have been buttressed by a 2003 National Research Council report, which found that "no current clean-up methods remove more than a small fraction of oil spilled in marine waters, especially in the presence of broken ice." In other words, no technology currently exists to recover oil spilled in the icy waters and harsh weather conditions found in the Chukchi Sea. Exposing polar bears to oil slicks, spills and leaks, as well as to other disturbances that come with massive oil and gas exploration and drilling operations, will further endanger a species that is already on the brink of disaster.

Shell Oil and similar fuel companies are poised to gain final approval from the Department of the Interior to begin major new activities in the Polar Bear Seas this summer. Shell will begin "seismic testing" – a major step toward eventual oil drilling and development – without having to ensure that its operations, which involve a small armada of vessels and associated aircraft, have minimal impact on polar bears. Such sensitivity would be required if the polar bear were listed under the Endangered Species Act.

The DOI's foot-dragging over listing the polar bear as a threatened species came to an end May 14, 2008. The Department decided to list the polar bear as a threatened species under ESA but did not take any action to reverse its stance on oil drilling in prime polar bear habitat or to address the threat posed by greenhouse gas emissions that are causing the melting of sea ice. In fact, Interior Secretary Dirk Kempthorne said during his announcement of the decision that the "listing will not stop global climate change or prevent any sea ice from melting." In other words, the polar bear listing was completely hollow.

In the absence of DOI action, Congress must ensure that this exceptional, unique animal receives every protection it needs to survive. With input from the Alaska Wilderness League and others, I have prepared legislation that would direct the National Research Council to gather information and to report how climate change is impacting the ecology of living marine resources in the Polar Bear Seas and how oil- and gas-related activities could affect plant and animal species, marine and coastal environments, as well as Alaskan Native communities and their subsistence lifestyles. The proposal would also direct the DOI to designate critical habitat areas for the polar bear and would require vastly improved oil spill response technologies prior to embarking on massive new oil and gas operations in these pristine waters.

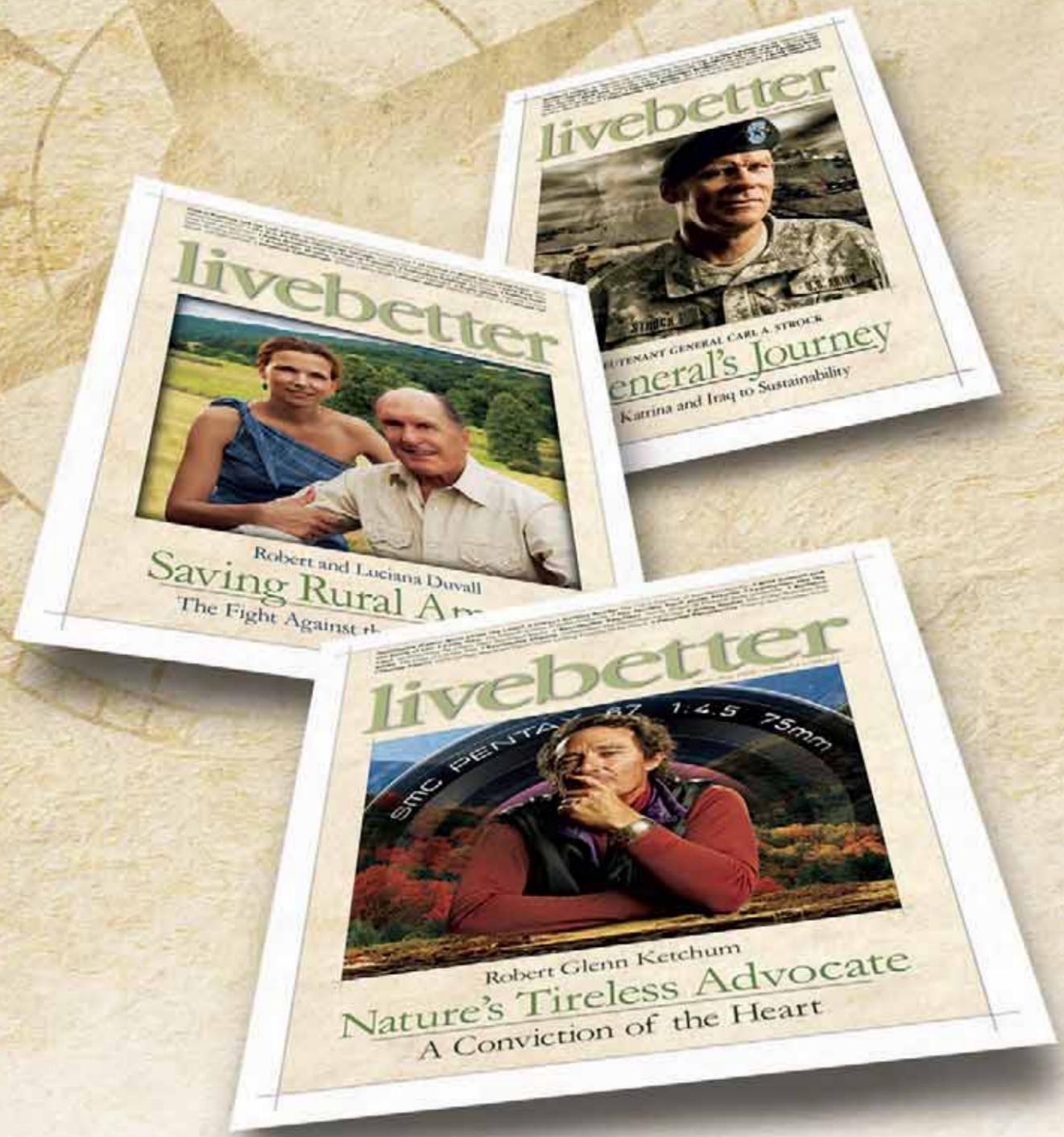


We must do the right thing and extend all of the protections to the polar bear and its habitat.

With sea ice melting at an astronomical rate, we must not add oil rigs and the risk of massive spills to the challenges facing the polar bear's continued existence. We must do the right thing and extend all of the protections to the polar bear and its habitat. There is still time for us to ensure that these wonderful animals will be around to capture our children and grandchildren's hearts. But time is running out quickly.

Mr. Jay Inslee (D-Wash.) serves on the House Select Committee on Energy Independence and Global Warming, the House Natural Resources Committee, and the House Energy and Commerce Committee. Ms. Shogan directs the Alaska Wilderness League, which works to protect Alaska's terrain for today's and future generations.

To support the polar bears and sustainability, log onto www.centerforabetterlife.com. Become a member (it's free) and express your concerns. We'll forward your comments to Rep. Inslee as ammunition in his battle to protect these majestic animals and their pristine habitat.



One Earth. One Family.
Live Better. Be Part of It.

To sign up for a free membership and to begin your paid magazine subscription,
log onto www.centerforabetterlife.com.
Or, mail the magazine reply card with payment to
P.O. Box 247, Newburg, WV 26410.

Want to Receive *Every* Issue of LiveBetter Magazine?
Become a Paid Subscriber and Help Us Grow.



Center for a Better Life
Help us grow.

A Living Systems Approach to Design

William G. Reed, AIA, LEED AP
President, Integrative Design Collaborative

Sustainability is not a deliverable. ▶ Sustainability is not a thing. ▶ Sustainability is not simply about efficient technologies and techniques. ▶ It is about life – a process by which living things such as forests, neighborhoods, people, businesses, mushrooms and polar bears ensure their viability over the long haul. ▶ It is a process of reciprocal relationship – a process by which living things support and are supported by a larger whole. ▶ That means a building can't simply be high performance and considered sustainable. ▶ Imagining a high-performance building is like imagining a high-performance liver. ▶ Certainly the limitations of that liver are obvious outside the context of the whole body. ▶ Buildings, neighborhoods and cities are the same. ▶ Buildings can be autonomous but become meaningful and beneficial only when understood as part of the living fabric of life.



© iStockphoto.com/venetiano

Because we are speaking of living systems, it is important to make a distinction: Life evolves and is not static; therefore, we can never restore something to its “original condition.” When we speak of restoration (of a woodland, a riparian system, a wetland), we are speaking of restoring a system’s capability to continuously self-organize and evolve. Regeneration is about framing restoration as a whole – engaging the earth systems, the biotic systems AND the people of each unique place in a continuous dialogue of restoration and evolutionary development – a healing of the “wholeing.” Regeneration means to give new life and energy to something. Sustained life and energy can happen only in a whole system. This ideology is not some nuanced, intellectual nicety; developing relationships between living things is required to achieve a sustainable condition. It is necessary to work in the whole system – a conservation or high-performance approach focused on reducing our impact AND a living system understanding focused on learning how to engage nature as a co-equal partner.



© iStockphoto.com/Chiehart

Everything we design engages with the living system that it is a part of – whether or not that engagement is unplanned or unintentional.

The word “development,” in its true sense, supports this perspective: “To bring out the capabilities or potential of; to bring to a more advanced or effective state; to generate or evolve; to reveal or de-veil.” “Develop” does not mean “to occupy.” To achieve true sustainability, we need to focus on developing our awareness, our capabilities and the potential for life in the places we build. This is not a new thought or a new practice – just a forgotten one – left in the wake of reductionist, industrial age and monoculture thinking. The result is a destroyed landscape, systems of life and forgetting how life works in each unique place. In the book *Tending the Wild* by M. Kat Anderson, we read: “. . . contemporary Indians often use the word ‘wilderness’ as a negative label for land that has not been taken care of by humans for a long time – for example, where dense understory or thickets of young trees block visibility and movement.”

As Thomas Morton said in his diary, “The Salvages (sic) are accustomed to set fire of the Country in all places where they come, and to burne it twice a year, viz: at the Spring, and the fall of the leafe.” A common sentiment among California Indians is that a hands-off approach to nature has promoted feral landscapes that are inhospitable to life. “The white man sure ruined this country,” said James Rust, a Southern Miwok elder. “It’s turned back to wilderness.” California Indians believe that when humans are gone from an area long enough, they lose practical knowledge about correct interaction; meanwhile, plants and animals retreat spiritually from the earth or hide from humans. When intimate interaction ceases, the continuity of knowledge passed down through generations is broken and the land becomes “wilderness.” As indigenous people – people in direct associ-

ation with the land that supported them, we used to have this living system knowledge. We are now beginning the rediscovery – or “remembering” – of the whole system of life in each unique place instead of simply recalling fragments in which we have been taught to specialize. We are being called to become indigenous once again – to become living and contributing expressions of a particular place.

Since we, as a culture, are asking ourselves how to become “sustainable,” we can start the design process by understanding life in each unique place we are building – an indigenous way of building. Like it or not, everything we design engages with the living system that it is a part of – whether that engagement is unplanned or unintentional. It is by expanding our concept of design to include **designing that engagement** that we find the potential not only to sustain but to regenerate – to develop something that **contributes** to the health and wealth of the place.

Three essential aspects serve as a basis for creating a regenerative or healing relationship with place:

1. We need to first **experience the whole system** within which we are working (often a watershed or two) and to understand the potential this system has to evolve to greater resilience and diverse relationships.
 - There is a critical distinction between knowing the facts and figures of a place and an understanding of how a place works and has evolved as a whole system. This requires moving beyond performance standards and how the elements of a system behave to developing a pattern of understanding relationships. Data-filled reports on soil, hydrology, habitat and social

history are not sufficient to understand patterns of life.

- These complex relationships are relatively easy to understand with the right expertise of pattern and living system understanding – systems ecologists or permaculturists, for example, along with people, usually locals, who deeply know the place.
 - On an Arizona project, the Fish and Game Department said they were very concerned that a proposed development would destroy the desert ecosystem. One family member who had been in that place for five generations had a different perspective; he observed that the ecosystem had already been destroyed. What is now a desert had 100 years ago been a three-foot-high dry-grassland prairie with running springs. After all, he said, why did my great grandfather bring cattle to graze here in the first place?
2. We need to relate this experience so other stakeholders can be inspired to appreciate the place as a living system. We call this a “story of place.”
 - A narrative or story is a powerful means of communicating complex relationships and engaging people in an understanding of how the pieces and subsystems in a place work together. We learn through metaphor. Our ability to communicate is based on metaphor. This is how we maintained and evolved our knowledge of a place for millennia – through song cycles, stories and epic poems. A story gives us the ability to convey “who” a place is and how to be part of it – the whole relationship between human settlement and the systems of life that are continually making the place.

3. We need to implement a continual **dialogue process** as part of the design and operation process to align the stakeholders' aspirations with the nature of the place.

- Regenerative design continually enriches dialogue among the designers, the community or organization, and the system of which the design is a part. Dialogue among stakeholders is an essential aspect of sustainability. This dialogue is a process of growing an understanding and a relationship with the place – economic, natural and cultural relationships.
- This dialogue should evolve forever – just as life does. Because we won't be around that long, key stakeholders should establish a **core team** whose job it is to hold and to develop the understanding of life in that place – the evolving story. The team's job is not to manage but to receive **feedback** from the system and to respond to it while helping

stakeholders understand implications of the feedback.

- The genius of Jamie Lerner's work in Curitiba was not simply an effective transportation system, education system or pedestrian environment; it was that he and his staff effectively formed a core team. The purpose of that particular group was not to manage but to hold the aspirations of the community. These key leaders met in the morning every day to envision and to understand the potential future – not to worry about day-to-day management. They sharpened and focused their thinking and the purpose for the work of the city. Great and evolving results come out of deep and systemic thinking. This pattern has been generally held for more than 30 years.

So here is a thought to chew on; we have an opportunity and an imperative to evolve our thinking and to practice our professions in a way that can contribute to regenerating our planet. Slowing down the processes of degradation, while essential, is insufficient.

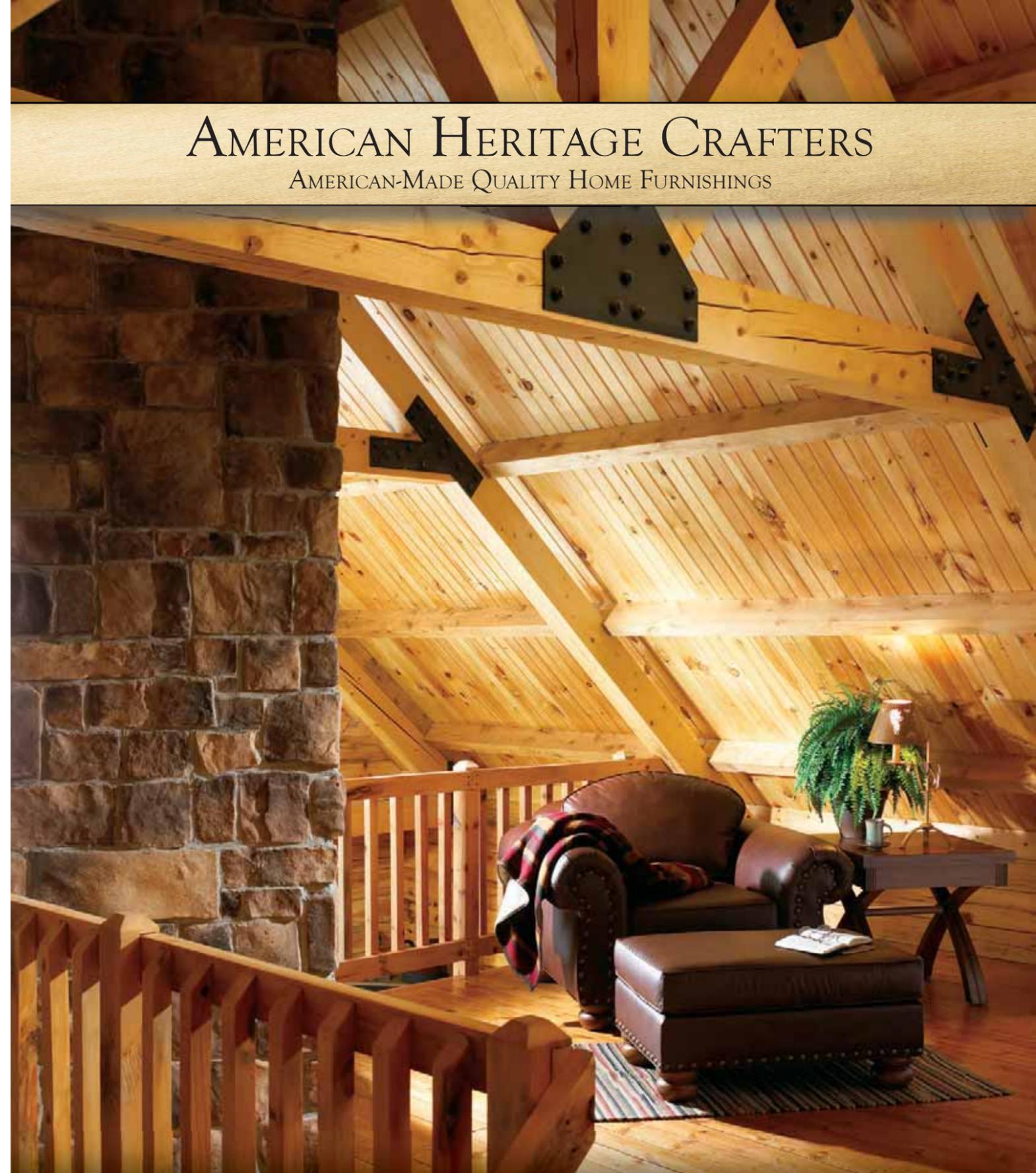
Regenerating the evolving resiliency and matrix of life in each place is the other half of achieving a sustainable condition. In fact, it's the easier and less expensive half if we only shift the purpose of design and the process of thinking this way. This nature of work will require us to think more and more like living systems and to embrace a whole systems mind and design process to truly participate in the system of life. The role of architecture and development will be dramatically enriched and positive. In addition, it's just plain, powerfully good fun. 🌿

Integrative Design Collaborative (IDC) is a consortium of advanced practitioners and leaders who serve as resources, coaches and program managers to help achieve increasingly higher levels of environmentally responsible design to move beyond sustainability. The corporate office is located in Arlington, MA. For more information, please call 781-483-3040 or go to www.integrativedesign.net

To support sustainable living, log onto www.centerforabetterlife.com and become a member; it's free.



© iStockphoto.com/jewmye



AMERICAN HERITAGE CRAFTERS

AMERICAN-MADE QUALITY HOME FURNISHINGS



A DIVISION OF KUHN'S BROS. LOG HOMES
FOUNDING MEMBER, CENTER FOR A BETTER LIFE

877-790-2194
www.americanheritagecrafters.com



Katrina and the IPET:
Understanding
the Truth
Behind
the Tragedy



© iStockphoto.com/cpurser



© iStockphoto.com/cpurser



© iStockphoto.com/RebekahBlocher



© iStockphoto.com/cpurser



© U.S. Navy photo



© iStockphoto.com/dswebb



© iStockphoto.com/cpurser

Hurricane Katrina will be remembered as an unparalleled national disaster not only because, according to the National Oceanic and Atmospheric Administration (NOAA), it became America's "most expensive natural disaster in U.S. history (\$133.8 billion in damage/costs) with the highest death toll since 1928 (approximately 1,833 deaths)," but also because of New Orleans' unforeseen destruction, the resultant blame game and media sensationalism. The event's reported media inaccuracies, which have perpetuated the heartbreak of a nation, continue to prevent many people from understanding the truth behind the tragedy. It's difficult to know whether the ongoing misinformation flow was a by-product of

power plays, political agendas or poor judgment. Maybe it was, more innocently, a consequence of the American public's need to lay blame on someone or on some agency in hopes of feeling safe again. After all, how could all of this have happened in America? Fortunately, it's possible to comprehend after reading the final volumes of the Inter-agency Performance Evaluation Task Force (IPET) Report, issued June 2008.

Now retired Lieutenant General Carl A. Strock, U.S. Army Corps of Engineers' (USACE) Commander, along with Major General Don T. Riley, then USACE Director of Civil Works, and Donald Basham, now retired Chief, Engineering and Construction, Directorate of Civil Works,

USACE, collaborated to create a mechanism that would, according to Strock, "... provide credible and objective scientific and engineering answers to fundamental questions about the performance of the hurricane protection system and flood damage reduction system in the New Orleans metropolitan area." On Oct. 10, 2005, Strock officially announced the IPET and named Dr. Lewis E. (Ed) Link, a member of the Civil and Environmental Engineering faculty at the University of Maryland in College Park, its Director.

"I've had absolute complete freedom to do what I felt was in the best interest of the public; and, I think, that was one reason why I didn't mind what started as a 9-month assignment becoming an almost 3-year endeavor. It's been gratifying to work on something of this magnitude and importance with so many people that are just incredibly dedicated to doing what's right. And, that's been astounding," commented Link as he was getting ready to put his ink on the final report.

IPET and Its Unique Dimensions

IPET continues to be more than a groundbreaking forensic study of Katrina-related events. The task force began as an investigation team with a dual mission: First, they

had to find out what happened to structures that comprised the Hurricane Protection System (HPS) and why it happened so that repairs and rebuilding would not reintroduce any vulnerability into the system. Second, the team put that knowledge into the ongoing repair work that was scheduled for completion before the next hurricane season following Katrina (June 1, 2006) and into building a foundation for developing stronger and higher levels of protection in the future. The task force wrapped up its work with an emergence of knowledge that is revolutionizing engineering as it incorporates ideas of "risk," "risk reduction" and "risk mitigation" into all aspects of practice and education, particularly for the Corps.

"We began with what the analysis should look like, what the major pieces would be... then we decided on an architecture that became the 10 teams that were involved in the IPET. We knew we had to take advantage of the best knowledge and expertise that existed within the Corps, but we also needed to create an environment of objec-

tivity and openness. We solved that by selecting co-leaders of each of the 10 teams so that each team had an external leader, like Dr. Mike Duncan from Virginia Tech, who is a nationally renowned geotechnical engineer, and a USACE leader, like the Corps' Dr. Reed Mosher, for the structural analysis. Mike and Reed were the co-leads for the performance analysis. Each team concentrated on a unique aspect of the analysis. We ended up with well over 300 people involved in the IPET... and likely more than half were from industry and academia. In addition, the credibility of what we did was clear and open: We set up a public web page (<https://ITEP.wes.army.mil>) on day one and posted our plans on the web site. At the same time, under Department of Defense and Corps direction, independent peer review panels of national experts were set up by the American Society of Civil Engineers (ASCE) and the National Research Council (NRC). And, we continued throughout the whole process to put whatever reliable information we had on the public website for everyone to use and to see. Each time we held a meeting with the ASCE or NRC panels, it was a public meeting and we had media involved," explained Link as he described the IPET's formation.

With this level of openness, transparency and objectivity, Link and other IPET team members were disappointed by much of what was portrayed in the mainstream

media. "I think there were a lot of inaccuracies with what the media presented. Some of it was headed toward the spectacular. There were a lot of people looking for villains and many, as you would expect, who were very bitter and very angry with what happened in New Orleans; that certainly is understandable. The trade press seemed to be more aware of the nuts and bolts of natural disasters so there tended to be less sensationalism in their reporting. The daily media, however, had a tough time with it. I think part of it was that Katrina was such a complex issue, and people were outraged," recalled Link.

Unraveling a Complex Environment

When the IPET team first appeared in New Orleans, they were staggered to see the level of flooding and destruction that had occurred in both economic and human terms. From the beginning, it was clear that there were unexpected dimensions to the Katrina tragedy. According to Link, "This wasn't a small storm; this was much more complex than what was being portrayed initially in the media. In addition, the size of the HPS - 350 miles of structures, all the pump stations, hundreds of other features like transitions from one kind of structure to another, and all the gates and closures that occur in these structures to allow water in and out - pointed to the complexity of the problem and the complexity of trying to unravel it, to decode it and to figure out exactly what did happen."

With this level of intricacy, it was obvious that every one of the teams' efforts would require considerable time to produce final outcomes. But they couldn't wait. So they devised a system whereby all 10 teams

The event's reported media inaccuracies, which have perpetuated the heartbreak of a nation, continue to prevent many people from understanding the truth behind the tragedy.



© U.S. Navy photo



© iStockphoto.com/cpurser



© iStockphoto.com/cpurser



© iStockphoto.com/cpurser

could work simultaneously even though each team's data was critical to another team's analysis. Link said groups achieved the amazing task by "iterating our way through this process. For example, every team would move forward and make the best estimate it could regarding the kinds of information on which team members were working. We'd go through the entire analysis up to a point by using the best data we had available, integrate the information and see where we were with regard to useful results. Then everybody would move forward another step. Then we would go through the entire analysis again so we kept iterating our way, all 10 teams, individually but together. The ASCE External Review Panel played a major role in our being able to impact repairs. They continuously reviewed IPET plans, processes, interim results and interim findings to provide confidence in transitioning findings to the Task Force Guardian folks who were engaged in the repair process. In fact, we had 20 people from Task Force Guardian embedded in the IPET teams so that when they saw info that was critical to their repairs, they would just grab it and run."

Uncovering the Causes of Flooding

The major flooding component in New Orleans, according to Link and the IPET, was the overtopping of earth levees, which caused substantial breaching. And the breaching occurred because, in some cases, the surge and wave environment created water levels of 5-10 feet cascading over the levees as water eroded them from the back, not the front, side. The biggest engineering problem related to flooding was the frailty or fragility of the I-walls (floodwalls). In four of the breaches – one on the 17th Street Canal, two on the London Ave. Canal and one adjacent to the Lower 9th Ward on the Inner Harbor Navigation Canal – the I-walls failed before the water reached an elevation considered to be their design elevation (the water did not overtop the walls).

The major flooding component in New Orleans, according to Link and the IPET, was the overtopping of earth levees, which caused substantial breaching.



© iStockphoto.com/ParkerDeen

In other words, they failed prior to when they should have and did so because of a design flaw that caused a deflection in the wall that allowed high water pressure to get into the system's foundation. The four I-wall failures were responsible for a large amount of water that flooded New Orleans neighborhoods and the Lower 9th, but the other 50 floodwall breaches (54 in all, 4 related to design flaws) were caused by overtopping. Of the 350 linear miles of HPS structures, the Corps eventually repaired and improved 220 miles of levees and floodwalls.

The original HPS design and the large amount of overtopping are integrally related. Based on the best available science and the accepted process in 1965, the Corps developed the original design criteria. Unfortunately, climatology changed dramatically from that time until the 1970s, when NOAA upgraded the hurricane threat. With this revised information in hand, Link explained, the Corps decided that it could not afford to "go back and redo everything that was being put in place based on this new hurricane threat." (Please refer to the USACE Hurricane Protection Decision Chronology report titled *Decision-Making Chronology for the Lake Pontchartrain & Vicinity Hurricane Protection Project, Final Report March 2008* for more information.) "Part of this decision was because the funding and authorization

'system' doesn't react well to change. In other words, there was no Congressional authorization to spend money on raising levees to deal with this more severe hurricane threat. I think the Corps' rationale was that it was better to have something than to have nothing. The idea was to move forward and to build something – what they had designed and approved already, and then seek approval to build higher levees – rather than to stop the presses and wait to see what happened."

The other big issue was the structures' height. The Corps became aware in the 1980s of a local elevation data error, which caused some structures to be built 2 feet too low. The Hurricane Protection Decision Chronology report addressed this issue, but Link has explained in easy-to-understand terms that "you don't just go add 2 more feet to the top of a floodwall. So, that was another big controversial issue. Now we have a more severe hurricane threat that wasn't dealt with and errors in elevations that aren't dealt with – that were deliberately not dealt with – because the decision was made to go forward and to put a complete system in place and then go back and fix it."

Another major issue was and continues to be the area's significant subsidence because of natural processes and land use decisions. "When you build on organic



© iStockphoto.com/jpeynick

soils and you drain organic soils and you pump a lot of groundwater out from under an area like New Orleans, it's going to sink. Many areas within the city that are now well below sea level used to be marshes that were approximately at sea level or above. But the development of the land and the pumping of the groundwater from underneath the city to keep it dry have caused these areas to subside. Along with the general landscape subsiding, the levees have subsided too. Everything is moving down. Maps published in the IPET report show that, as a direct result of this subsidence, some structures are more than 2 feet below their authorized elevations. Pumping of groundwater and development of swamps is not a natural process. The whole region is subsiding somewhere between 1/2 -1 foot per century, but this man-induced subsidence – that's

Homeowners need to realize that they have one chance in four that their house will be flooded within the life of their 30-year mortgage.

in addition to the regional subsidence – has been much more rapid than that. When you add everything up, you end up with a big disaster," explained Link.

Another unexpected, significant factor in 2005 was Katrina's massive size. "Perhaps the most egregious misconception in the media was that Katrina was a small storm. This was unfortunate because it really led people down the wrong path, and they didn't understand the challenge that Katrina presented. On the eastern side of New Orleans, Katrina created a surge and wave environment that was greater than anything North America has seen before (28-foot storm surge; 55-foot waves). It was huge. The problem is that the Saffir-Simpson Scale (normally used in weather forecasting to 'categorize' a storm) is a very poor estimator of surge. It's the combination of the intensity and the physical size of the storm that generates surge. And that was one of the major findings from this analysis. There's a National Academy of Sciences committee in place right now trying to decide exactly how we can better estimate the intensity or the severity of hurricanes," Link said.

Dealing with Dynamic Changes

Back in 1965, when the HPS was originally designed, engineers thought they knew what the hurricane threat was, and they used the

best science available. "Now we look back 50 some years and say 'boy, you guys really got it wrong'; but it wasn't because they were dummies. They didn't have the advantage of the updated understanding of hurricane climate and so on. You learn something new all the time. For example, we learned that NOAA put out revised information on the more severe hurricane threat. Then the error was found in the elevation datum; and, probably with the new technologies, the amount of subsidence, the degree of subsidence and the condition of the structures could have been better estimated than back 50 years ago.

"But the real problem is how to deal with the current way that water projects are authorized, funded and operated. The system is not very agile, and it's very difficult to deal with dynamic things that can cause major changes. What's more challenging is getting the money to make those necessary changes. When you look at the funding history of projects for the New Orleans HPS, the last couple of decades have not seen a lot of resources poured into that compared to what the original needs were. Some of that was cost escalation, inflation and so on; but the Hurricane Protection Decision Chronology report shows that actual cost was a huge factor in what the system ended up looking like. Local entities were charged with paying 30 percent cost share, and part of their challenge was trying to figure out where to get that money. That became an issue with regard to the ultimate design and the ultimate footprint of the HPS that got put in place," explained Link.

Yet another serious issue is people misunderstanding nomenclature. For instance, a "100-year storm" does not mean that a storm of a given magnitude will occur only



© iStockphoto.com/cpurser



© iStockphoto.com/RebekahBlocher



© iStockphoto.com/joeynick

once within 100 years. It means that such an event has one chance in four of occurring within a 30-year mortgage or a 1 percent chance of occurring each and every year. With respect to one's understanding of "100-year protection," the meaning is the same. Homeowners need to realize that they have one chance in four that their house will be flooded within the life of their 30-year mortgage. These odds are not good, particularly when lives are at stake. This same event over 78 years (the average U.S. lifespan) has a 54 percent chance of occurring. Over 100 years, it has a 63 percent chance of occurring. "If you had this kind of chance of being killed in a car, you wouldn't get in a car," Link added.

The Corps is currently authorized by Congress to achieve 100-year protection in rebuilding the HPS, at a total investment of more than \$15 billion, and is conservatively adding in the potential impacts of climate change, sea level rise, subsidence and more severe storms to afford an extra degree of protection into the system. The Louisiana Coastal Protection and Restoration Study (LACPR), a Corps project in partnership with the state of Louisiana, is looking at reasonable ways to provide even higher levels of protection in the future. According to Link, "The ideal would be to have the wetlands and levees working together. That's not always possible, but it would be the ideal. If we're going to achieve higher levels of protection in a practical manner, it's going to have to be through some combination of natural environment and physical structures."

"When the 100-year structures (scheduled for completion in 2011) are in place, New Orleans will have the best actual

"IPET findings and lessons are based on the experience of a past event, Katrina, but they are an important lens into the future. We too often optimize based on immediate cost and accept short-term gains instead of long-term solutions."

physical risk reduction measures it has ever had. Yet, it will still be vulnerable to flooding by very large storms. Bottom line: This city will be the only one in the nation that has a rigorous assessment of its risk. That huge advantage will allow much smarter decisions to be made for redevelopment and recovery as well as for better managing hurricane risk in the future. Methods developed for New Orleans are applicable anywhere and need to be evolved and improved to provide effective decision support tools for protection of other people and other cities," explained Link.

"IPET findings and lessons are based on the experience of a past event, Katrina, but they are an important lens into the future. We too often optimize based on immediate cost and accept short-term

gains instead of long-term solutions. This is a national cultural malady that can only be reversed if the public demands a change in policy. There's a whole new body of knowledge as a result of the IPET findings that we've just begun to apply now, and we've got to continue to apply it, to learn and to grow from it. That's really critical so we have to keep the momentum going. We can't let it relax," declared Link, who looks forward to a better and safer America – thanks to his IPET team members. 🌱

To read more about the IPET, the USACE Hurricane Protection Decision Chronology report or Link's latest policy statements and recommendations, please go to our website at www.centerforabetterlife.com. Support sustainability. Become a member of the Center for a Better Life; it's free. To receive every issue of *livebetter* magazine, please refer to this issue's attached business reply card for more information on how to become a paid subscriber.



**One generation plants trees.
Another gets the shade.**

Confucius

At Earth Tech, we believe all sustainable projects and design approaches should integrate ecological, economic and social issues. Our commitment to sustainability is reflected through our tailored strategies, active engagement in green building councils, LEED-accredited staff, and our in-house training. By delivering sustainable solutions, Earth Tech effectively helps you manage your environmental footprint to ensure a better tomorrow.

For more information, call 800-913-7993 or visit earthtech.com.

EarthTech A BETTER TOMORROW made possible
A **tyco** International Ltd. Company



“One of the most important things in the IPET and the HPDC is the concept of risk – from the personal risk individuals face when they choose to live or to develop in an area to the public risk that must be managed by public officials.”

Personal Reflections: **Katrina, The Corps and Change**

Lieutenant General Carl A. Strock, retired, former U.S. Army Chief of Engineers and U.S. Army Corps of Engineers’ (USACE) Commander

“As a public agency the Corps of Engineers must do the right things and do things right. Where storm damage reduction in New Orleans is concerned, we did the right things as defined by Congress and the various administrations we served and as guided by public policy. Our failure was that, in hindsight, we didn’t do things right. I say ‘in hindsight’ because our engineers and decision-makers used accepted design practices that didn’t anticipate the failure mechanism involved in the collapse of the flood walls along the city’s canals. In one sense it was easy to stand up and accept accountability, because that was the right thing to do. There were certainly many mitigating circumstances that, over time, will become apparent. But, it was also very difficult because I had to publicly accept the reality that the very agency the public has relied on for over 200 years contributed to the loss of life

and property – something none of my predecessors ever had to do.

“If you look at the history of the Hurricane Protection System around Lake Pontchartrain, our initial recommendation back in 1965 – to build a large surge barrier at the mouth of the lake – was challenged under an early National Environmental Policy Act (NEPA) lawsuit. And with each successive recommendation we encountered opposition and objections, so we eventually went with the current system of levees and flood walls along the lakefront and canals. One of our failures, brought out in the Interagency Performance Evaluation Task Force (IPET), was lack of recognition of the cumulative risk associated with each successive change in plans. (See this issue’s Cover Story.)

The Boiling Frogs Analogy

“One of our Southern ‘engineer philosophers’ equated our situation to boiling frogs: If you want to boil a frog, you don’t bring the pot to a boil and throw the frog in, because he’s out of there. But if you put him in a nice pot of cool water and put it on the stove and turn on the heat, it will slowly warm. And he’ll stay in the water and won’t realize he’s being boiled until it’s too late. Like the frog, we didn’t recognize the cumulative impact of the incremental decisions we made over a 40-year period. We recognized the incremental risk at

each decision point, but didn’t recognize the dramatic difference between our original recommendation and the final solution. If we had said ‘go from the big barriers to I-walls,’ the shock effect would have been pretty dramatic. Someone would have likely said ‘There’s such a big difference in what you’re doing there; how could we possibly do that?’ And, we might have avoided the disastrous consequences. The other factor, also related to incrementalism, was that the project was authorized in 1965; and when the hurricane hit 40 years later, we were only 80 percent complete. And a lot of what we had done and considered finished had been overtaken by the geologic processes of subsidence and sea level change. Part



of the problem was the incremental funding we received from Congress. And part of that goes back to the political process that guides Corps activities.

“That’s one of the reasons we undertook the Hurricane Protection Decision Chronology (HPDC). It’s an effort to gather all the archival information we could find about the context in which decisions were made. Our intent was not to build a justification for what we did, but rather to make the source documents and information available so that readers could draw their own conclusions from a transparent presentation of the facts. I’m convinced that those who are truly interested and take the time to study the history will discover that the Corps didn’t just get up one day and say ‘Let’s go put some levees and I-walls around New Orleans.’ I also believe the HPDC will be a resource that provides tremendous insights into public policy and decision making and will, perhaps, lead to needed reforms.

“One of the most important things in the IPET and the HPDC is the concept of risk – from the personal risk individuals face when they choose to live or to develop in an area to the public risk that must be managed by public officials. There are life-safety risks and there are economic risks; so you need to understand those. It’s clear that those risks weren’t adequately communicated to our citizens and understood or managed by many public officials. You must also understand other risks – like risks to the natural environment, especially aquatic ecosystems – when you construct a levee and change the natural flow of a river. In the Corps we really didn’t make a lot of decisions. The Corps’ role is to make recommendations to the administration and to Congress on what to do. Sometimes people made

decisions that were contrary to our policies and recommendations. My mantra was to ensure that those who made the decisions, both individuals and public officials, could make informed ones by having all the information available to them in order to understand the consequences, whether positive or negative. When we’re working with public officials and say ‘These are your options and their respective pros and cons. This is our recommendation. If you don’t follow the recommendation, the alternative you favor has the following risks. Are you OK with that increased level of risk?’ It may sound like CYA, but it’s not really that. It’s about making sure that they’re making truly informed decisions and can’t come back and say ‘If only I had known, I never would have done that.’

“I’ve always believed that life is about 10 percent what happens to you and 90 percent how you respond to it. It’s disappointing to me that no other individual, group or agency that contributed to the terrible losses of Katrina said ‘We could have done things differently or better.’ Everyone else was very defensive. The Corps of Engineers was the only entity that had the courage to stand up and say ‘We got it wrong.’ The ‘Twelve Actions for Change’ (AFC) represent an institutional response that acknowledges the Corps’ need to do things differently. It was a way to say ‘We got it; we learned something here.’”

Donald Basham, retired, former Chief, Engineering and Construction, USACE Directorate of Civil Works

“It’s hard for people to understand risk; and, I think, in some cases people just take risk for granted. Having a better understanding and predictive tool out there in the future that says ‘When the storm reaches a certain category, what is the wave and surge that’s going to hit New Orleans?’ that’s what people need to understand. ‘Is that going to exceed this 17- or 25-foot levee in my backyard?’ I think that information is so critical. To say ‘There’s 27 feet of water going to hit New Orleans, and I live behind a 100-year level of protection’ really doesn’t tell anybody anything. You need to understand that’s a 17-foot high levee from sea level, and there’s 27 feet of water coming. It doesn’t take much to subtract 17 from 27 and know that 10 feet of water is coming over the top. I think you have to get it down that basic and simple so people can understand.

“Another problem is that people really are used to getting the 30-second sound byte that defines who caused the problem or what the

“Maybe communities need to take events like disaster preparedness more seriously and conduct exercises just like they do for a fire or safety drill in their home or school.”



problem is. So when you start to talk about a system of failures – that there were a whole bunch of things that contributed to this tragedy – then there are some out there that begin to think ‘Well, you’re not telling me the truth; you’re trying to cover up what really went wrong; you big-time engineers ought to be able to tell us what the real problem was here.’ And it’s more complicated than boiling it down to the 30-second sound byte to know what the real key issues were here.

“Over the years the Corps used to talk about ‘flood control;’ and then it came to realize that maybe we were part of the problem in our terminology. We’re not going to control the flood. We may reduce the damages associated with the flood by building levees and dams, which will provide some level of protection. But you’re not going to control the flood; you’re not going to control a hurricane – at least I don’t think so in the foreseeable future. We need to understand that, at the end of the day, people make their own choices. What we need to do better in the engineering and science community is to help provide better tools and techniques for them to make informed decisions. If folks want to live in New Orleans, they need to understand what level of risk is associated with the notion of living 5 feet below sea level, not even counting a hurricane. And people need to understand that even if they have FEMA insurance and federal support for the insurance program, that’s just about property. That has nothing to do with protecting people as far as health and safety; it’s not going to recover a loss of life.

“Maybe communities need to take events like disaster preparedness more seriously and conduct exercises just like they do for a fire or safety drill in their home or school. Maybe people need to question the local leadership about ‘What is the evacuation plan to get the folks who live in nursing homes to safety?’ Seventy-five percent of the people who lost their lives in New Orleans were over the age of 60 – either elderly or disabled – those least able to evacuate without assistance. How is the community going to take care of these folks? You need to have a plan to take care of these people and to get them out of harm’s way.

A Historic Body of Work

“My role in the IPET was behind-the-scenes to include advising the Chief to initiate the investigation and the search for the facts – and nothing but the facts. I formulated the overall concept and framework for the forensic investigation, which included the External Review Panel’s concurrent independent review

“We’re working with Congress to change the way we plan our projects and the kinds of recommendations we give them.”

and the selection of Drs. Link and Jaeger to lead the investigation. In addition, I led the overall effort until my retirement. For me personally, the whole IPET investigation and the external review process – the way it was all set up and the way it was conducted and went on – is probably one of the things I’m most proud of in my whole career. The study is historic; it will change the practice of engineering. I think people will stand back and say one of the greatest bodies of work that’s going to come out of this IPET investigation is the development of a risk-based methodology. . . . That’s already part of the airline and auto industries.

“I keep on going back to the simplest thing that, I think, most Americans can equate to since it’s been beaten into them over the years – the use of seat belts. You don’t reduce your potential of having an accident by putting on your seat belt; you don’t reduce your probability of having an accident by having airbags. But you do reduce the consequences of the event should it occur (i.e., loss of life and/or personal injury). That’s where we need to get to in the engineering/levee arena in helping people buy down that risk through emergency evacuation plans: making decisions to get out sooner; making sure that (when local communities have contracts with vendors) you don’t have eight parishes contract with the same bus vendor to get people out and planning ahead so, when the event occurs, people aren’t overwhelmed. Inform yourself if you live behind a levee; understand what that levee is and determine what level of protection it affords you.

But, more importantly, what’s the residual risk to you, your family, your community and the place you work? Ask more informed questions. If there had been that kind of understanding for the residents of New Orleans, maybe fewer people would have lost their lives.”

Major General Don T. Riley, former USACE Director of Civil Works and now Deputy Chief of Engineers and Deputy Commanding General of the USACE

“I think the IPET and HPDC both reveal how complex the whole system and environment was – federal government partnered with state and local authorities, multiple agencies involved over a period of 40 years, differing levels of authorities, different projects authorized at different times, funded at different rates, authorized for different purposes and not very



coherent. So when you talk about the question of blame, you have to put the blame on the system and what drove all those decisions for all the stakeholders involved. The whole system lacked synchronization, focus and discipline.

“That’s why we decided to do the HPDC. It’s been in draft form since Spring 2006; and, of course, it’s taken a long time to refine it, to put great rigor into it and to make sure that anything that’s stated in there is backed up by a document. There’s nothing in there that’s speculative; there’s nothing in there that’s innuendo. It’s all fact. . . . Looking back has been very helpful to make evident to everybody in this business how something like that could happen. But, more importantly, how do you avoid it in the future?”

A Major Transformation

“In May 2006 LTG Strock released the IPET; and, at the same time, we had emerging results from the HPDC. So I went to the Chief and said ‘We need to announce what we’re going to do about the Katrina tragedy.’ I got my guys together, and we developed these ‘Twelve Actions for Change,’ which have been retitled ‘Actions for Change’ (AFC). That embarked us on a major transformation system within the Corps and an effort to transform those systems external to the Corps. We asked questions like ‘How are we going to transform not only the way we operate – our process – but also how we develop technical expertise in the Corps?’ ‘How do we tap into that expertise?’ ‘How do we transfer the great research and development we do into practical work in the field?’ ‘How do we communicate risk?’ ‘How do we take a systems approach and inform our decisions based on risk and uncertainty rather than on the old way of doing things?’

“We’re putting many of these solutions into practice now although we have a long way to go. But we’re making pretty darn good strides. We’re working with Congress to change the way we plan our projects

“Climate change is a big uncertainty. Since nobody knows the future, trying to capture and deal with uncertainty is very challenging.”

and the kinds of recommendations we give them so they, too, can work in a more systematic way rather than on a project-by-project basis. One of our main objectives is to take a systems approach to problem-solving – phase, time and function – with all our stakeholders over time. This will begin with the planning stage all the way through design and construction, operations and maintenance. In addition, we’re now making our decisions based on an understanding of risk, and we’ve committed to communicating that risk so well that people will take personal responsibility for their own risk.”

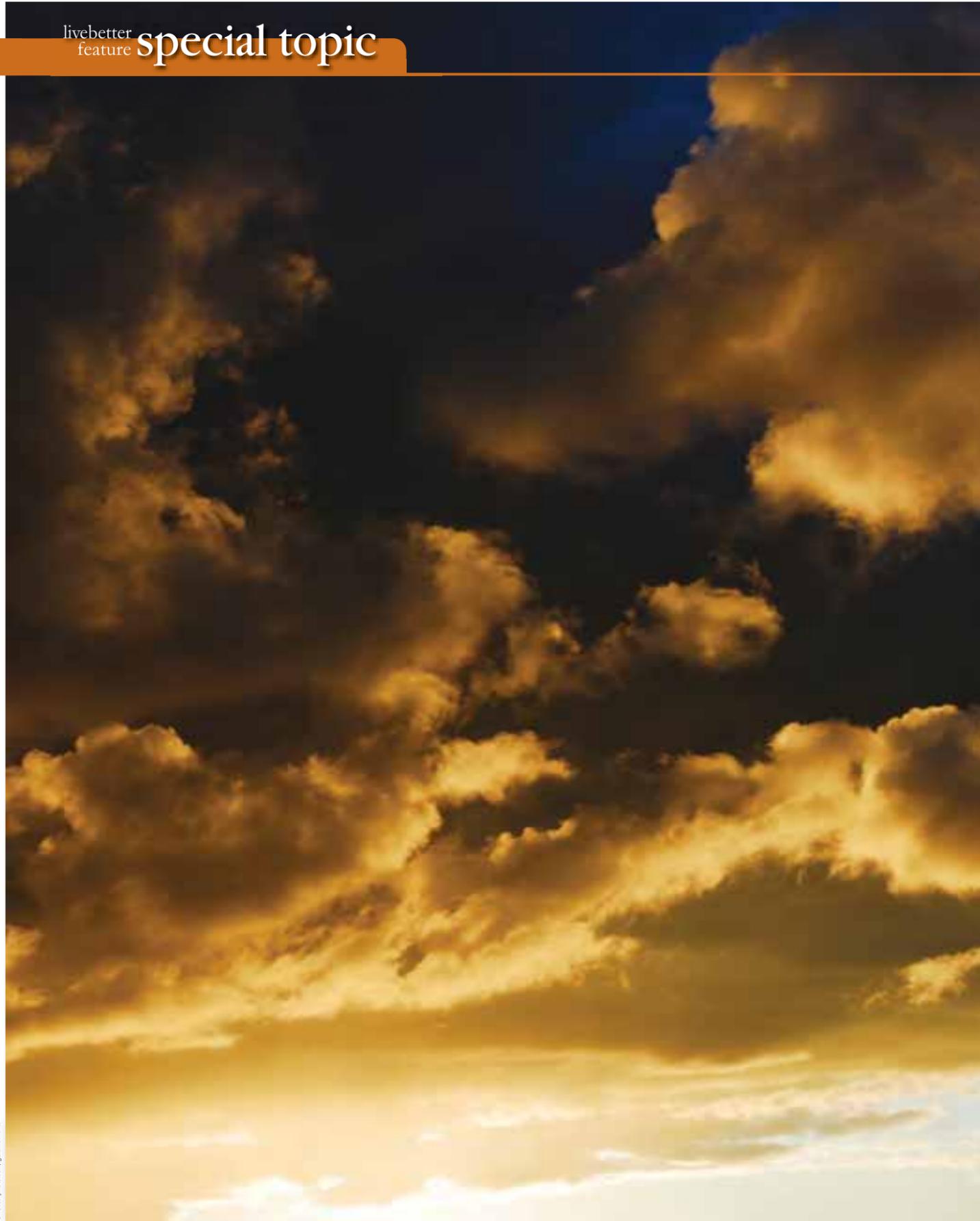
John J. Jaeger, Ph.D., P.E. and Chief, Engineering and Construction, USACE Huntington (WV) District, Deputy Director of the IPET

“We took the ‘Actions for Change’ and grouped them into four themes. Within the first theme we’re looking at a comprehensive systems approach to everything we do throughout the Corps. The second theme is we’re developing the policy, procedures and training to make more informed risk decision-making. The third theme is we’re communicating risk to the public, and the fourth theme is we’re developing professional and technical expertise. We’re looking at policy, procedures and organizational structure; behavior, technical and professional competency; and investing in our engineering and research development.

“I’m leading a national team on the professional and technical expertise. We’re taking a look at our future missions, roles and methods of delivery that we’re going to need to be great today and into the next 10 years – identifying the technical competencies that we’re going to need in the future. We’re working on items such as ‘What kind of technical competencies are we going to need for the future?’ ‘What are the best business practices for managing those competencies?’ and ‘What are the best business practices for recruiting, hiring and retaining engineers and scientists?’

“In the near future, the next couple of years or so, we have a pretty good understanding of what could be expected. That’s based on our knowledge of the past, projecting that forward. But if you start getting out more than a couple of years, as more information become available, that uncertainty becomes more prominent. . . . Time changes, and more information becomes available. For instance, climate change is a big uncertainty. Since nobody knows the future, trying to capture and deal with uncertainty is very challenging.”





Impacts on the lives of human beings from natural disasters, which includes landslides, avalanches, wildfires, floods, tsunamis, volcanic eruptions, tornados, earthquakes and hurricanes, are both severe and devastating.

COMPOUNDING CATASTROPHE:

The Impact of Humans on Natural Disasters

“The dual forces of global warming and poor human management choices regarding land and water resources combine to cause ‘natural’ disasters, and poor planning and preparation exacerbate the level of damage experienced,” explains the United States Agency for International Development (USAID). USAID is just one of many worldwide organizations sounding a wake-up call to humanity regarding its need to coexist within the parameters that Earth sets forth – parameters subject to an unstable, sometimes threatening and always evolving environment. For example, the United Nations’ Intergovernmental Panel on Climate Change (IPCC) outlines that global warming is “morphing” previously understood weather systems, which are causing an increase in natural disasters. This effect is an international problem because, as the IPCC describes, “. . . where extreme weather events become more intense and/or more frequent, the economic and social costs of those events will increase and spread from directly impacted areas



© iStockphoto.com/AmbryMB

and sectors to other areas and sectors through extensive and complex linkages.” Fortunately, if humans become proactive, a “least-cost” approach that makes full use of science and the wide range of tools, methods and technologies now available can mitigate the devastation resulting from natural disasters.

Natural disasters, which include landslides, avalanches, droughts, wildfires, floods, tsunamis, volcanic eruptions, tornados, earthquakes and hurricanes, can devastate humans. Between 1974 and 2003, 6,367 natural disasters occurred globally and

resulted in more than 2 million reported deaths. Overall, more than 5 billion people were affected; 182 million were left destitute and homeless; and estimated damages totaled U.S. \$1.38 trillion, concludes Prof. Debarati Guha-Sapir, Ph.D. and Director, World Health Organization’s (WHO) Center for Research on the Epidemiology of Disasters (CRED). Guha-Sapir, et. al., in *Thirty Years of Natural Disasters 1974-2003: The Numbers*, provides a human face to the bleak statistics by saying, “. . . these figures may seem very high, but they are probably underestimates . . . Such large numbers may appear abstract and difficult to conceptualize; but they are a harsh reality for families who have lost loved ones, had their homes reduced to rubble or watched their investments destroyed by natural disasters.” In the United States alone, 78 (\$1 billion) weather-related natural disasters produced more than \$600 billion of destruction between 1980 and 2007, according to the National Oceanic and Atmospheric Administration (NOAA).

Many believe the human role in natural disasters is passive – relegated to being a victim of nature. But scientists and engineers are beginning to understand the impact of disregarding land use planning and protection systems that could save lives, families, homes and communities. “Societal factors are very important to shaping trends in damage related to hurricanes,” concludes Roger Pelke Jr., a senior scientist with NOAA’s National Center for Atmospheric Research. Pelke and other researchers have observed an upward trend in damages clearly evident in the past 100 years of hurricane activity. He advises, “As people continue to flock to the nation’s coasts and bring with them even more personal wealth, losses will continue to rapidly increase.” U.S. Census Bureau statistics indicate that coastal counties are now home to 53 percent of the population and will rise to 75 percent by the year 2020 if trends continue. Indeed, the IPCC purports, “Coasts are projected to be exposed to increasing risks, including coastal erosion, due to climate change and sea level rise. (See this issue’s Climate Change Report.) The most vulnerable industries, settlements and societies are generally those in coastal and river flood plains . . . especially where rapid urbanization is occurring.”

“Coastal zone management is a major effort within the federal government to get people to look at where they’re living and building and recognize what the future’s going to look like with sea level rise and coastal erosion. Unfortunately, I think the current understanding of coastal erosion is very localized. Typically what happens is that people don’t start to worry about it until there’s a disaster. Authorities need to zone these areas properly so people don’t just continue to pile into them,” says Major General Don T. Riley, Deputy Chief of Engineers



“COASTS ARE PROJECTED TO BE EXPOSED TO INCREASING RISKS, INCLUDING COASTAL EROSION, DUE TO CLIMATE CHANGE AND SEA LEVEL RISE. THE MOST VULNERABLE INDUSTRIES, SETTLEMENTS AND SOCIETIES ARE GENERALLY THOSE IN COASTAL AND RIVER FLOOD PLAINS . . . ESPECIALLY WHERE RAPID URBANIZATION IS OCCURRING.”



© iStockphoto.com/fdbin

and Deputy Commanding General of the U.S. Army Corps of Engineers (USACE).

The Importance of Understanding Risk

“Risk abounds everywhere,” states Brigadier General John McMahon, Commander of the USACE South Pacific Division. “It boils down to a matter of not ‘if’ but ‘when.’” McMahon also insists:

“Public safety is of paramount concern and something we need to pay attention to as it pertains to the risky environment in which we live. We can never eliminate all of the risk that is around us, and this is especially true when we consider flood risk. Even with efforts to reduce risk, there are potential consequences. For example, if we build a new levee, we’re creating an opportunity for some people, developers in particular, to come in and build homes because there’s an idea that we’ve staved off some risk. People need to think through the ‘what ifs’ more. What if a flood comes? What if more rain and snowmelt occur overpowering the capacity of the flood protection system to contain or control the flood? Or worse, what if a levee breaks, or overtops, and subsequently fails?”

Gerald E. Galloway Jr., P.E., Ph.D., a Glenn L. Martin Professor of Engineering and Affiliate Professor at the School of Public Policy, University of Maryland, College Park, is an expert in the field of water and flood management. He worked on the 1993 Great Mississippi Flood White House study and has testified before Congress repeatedly. He warns, “If we had done what we were supposed to do when we identified some of these problems 10 years ago, New Orleans wouldn’t have happened. And we wouldn’t have some of these other issues we now face.”

McMahon adds: “The IPET Report of Hurricane Katrina (see this issue’s Cover Story) emphasized the need to better understand and communicate the risk of living in flood plains and behind levees. People need information because important personal and public policy decisions are at stake. What’s acceptable risk? How much are people willing to invest for higher levels of protection? Who pays and how? What’s environmentally sustainable? How do levee improvements in one community affect

flood risk for those up and downstream?”

General Riley believes that it’s critical to inform the public even when the news is hard to hear: “Our efforts to explain risk have increased dramatically. It’s best done collaboratively, hand-in-hand with other federal agencies, states, academia, industry and local stakeholders. That’s important. As engineers, we can’t just say that we’ve developed this solution and here it is. We need to take time to work with communities and to help people examine the implications. We do get a lot of pressure and sometimes great resistance when we have to share bad news with the public. Decertifying levees is a big shock to communities. However,

people need to know when they are at risk. So we try to build support for providing the truth.”

Galloway agrees and points out that protection systems are not fail-safe. He cautions: “. . . we shouldn’t put people in harm’s way when it is not necessary. Don’t develop areas in the flood plain that are currently undeveloped and cause people to be at risk. There’s a residual risk if you live in the flood plain. If you’re protected by a levee or a floodwall, there’s always a possibility that it will overtop or collapse. No matter how well you build it, we don’t know years from now what the money situation will be or whether anyone will maintain it.”

The Flood Plains of California’s Central Valley

The Central Valley of California is considered by many experts to be the next major catastrophic disaster waiting to happen. Rapidly expanding urban centers in this area lie in two major rivers’ flood plains – the Sacramento and the San Joaquin – as well as near other rivers and tributaries that drain from the Sierra Nevada Mountains. Galloway chaired a 2007 Independent Review Panel assessing flood risk in this Valley which estimates “potential direct flood damages in the Sacramento area alone exceed \$25 billion.” He describes his ideology about high-risk areas: “One of



© iStockphoto.com/JulienGrandin



© iStockphoto.com/damyan



© iStockphoto.com/ChrisCoffler



© iStockphoto.com/citispencer

the fathers of flood management, Gilbert White, once said ‘Floods are natural events. Flood damages are human events.’ Nature has the right to the flood plain, and we choose to interpose ourselves in its way.”

As a prime example, Galloway and other experts contend that the current flood control system of the Central Valley of California is incapable of dealing with the threat of severe weather events. McMahon concurs: “A lot of the levees that supposedly protect us in the Central Valley are non-engineered levees that have been created as sediment flowed down our river system as a result of hydraulic mining that went on in the foothills of the Sierra a hundred years ago. Sand and other poor quality materials were stockpiled along the banks of our rivers which allowed water to flow down the river freely and keep the river clean. There are well understood consequences with all of the development that has occurred behind these non-engineered levees. We have a big problem with the falsehood of being protected by levees that were not necessarily engineered.”

In addition, many residents don’t realize that the majority of levees are maintained privately or by non-federal agencies. Galloway explains: “As a matter of fact, the minority of levees are operated by the federal government . . . and the challenge is that everyone underestimates what it takes to take care of a levee. The levee is essentially a pile of dirt. If it’s a good levee, it’s a carefully placed and compacted pile of dirt. Even with that, the higher the levee gets and the heavier it becomes, the more probable that you will have subsidence – areas where it’s going to dip down and create a low spot. You have places where some of the soil isn’t going to be very good; animals burrow in it; people put trees in it; all of these things compound to make it a hazard. I was in charge of some major levees on the Mississippi River, and those are primarily maintained by the federal government. Those levees are huge, carefully watched, guarded and maintained because they have the adequate support to do it.

But, most places don’t have that support, and that’s the problem California is struggling with right now . . . Altogether we’re dealing with a system where there’s a great deal of uncertainty as to its integrity.”

Galloway points out that in parts of the Sacramento area “the levees don’t provide more than 33-year protection . . . a 100-year protection means that you have a one in four chance of a levee being overtopped within the life of a 30-year mortgage; that’s not very good.” Of course, natural resources and available economics dictate protection levels. Galloway elaborates: “What has happened over time is that when we began to cost-share the construction or upgrade of levees between the locals and the federal government, the locals didn’t want to invest so heavily, not understanding what the difference between a 500- and 100-year



protection level was. California has legislated that new levees have to be at the 200-year level; however, it’s going to take a while to get there because some have to get up to the 100-year level first.”

“We’re dealing with the California levee system on a project-by-project basis, and we’re applying the lessons learned from the IPET and the Hurricane Chronology. As a result, we’ve generated a lot of public angst that we’re being too harsh because we came out with a much more deliberate approach but a stronger approach. The highest level of flooding in New Orleans was about 10 feet, but the highest level of flooding in the areas north of Sacramento will be about 23 feet if the levees break. It’s very serious so we’re setting standards, very clear standards. We’re clarifying those standards, and we’re going to hold people to them,” remarks Riley.

Assuming Personal Responsibility

“Building levees to the standard flood protection level is important, but it has to be accompanied by land use planning and evacuation planning, not developing new areas in the flood plain, as well as by requiring flood insurance. People who live in the flood plain are at risk. But, the challenge that we’ve had in this country is that when flooding occurs, the federal government tends to come in, provide some high level of economic support and do a great deal to take care of the people, whether or not they carry insurance. So it’s a disincentive for people to buy flood insurance. We’re still finding very low penetration rates on such insurance, though it’s mandatory for people with mortgages insured by a federal agency. By not getting flood insurance, people are not assuming personal responsibility for their property,” explains Galloway.

Riley concurs: “People need to take personal responsibility for where they live and work and not put that responsibility on the federal government. A levee could be part of the solution as could coastal protection, insurance, evacuation planning, coastal zoning, building codes – any or all of those. You start with the high risk, and then you take these other steps to buy down your risk. And the public is responsible for doing this as citizens. In other words, if you buy a house on the coast, you’re responsible for the risk of doing that. We had a good response to this when we articulated the risk in New Orleans. One reaction that we got was ‘Now that you told us what our risk is, we can no longer blame it on the federal government.’ I thought that was a wonderful reaction. That’s exactly what we’re trying to achieve – to get everyone so well informed that they take

“PEOPLE WHO LIVE IN THE FLOOD PLAIN ARE AT RISK. BUT, THE CHALLENGE THAT WE’VE HAD IN THIS COUNTRY IS THAT WHEN FLOODING OCCURS, THE FEDERAL GOVERNMENT TENDS TO COME IN, PROVIDE SOME HIGH LEVEL OF ECONOMIC SUPPORT AND DO A GREAT DEAL TO TAKE CARE OF THE PEOPLE, WHETHER OR NOT THEY CARRY INSURANCE.”

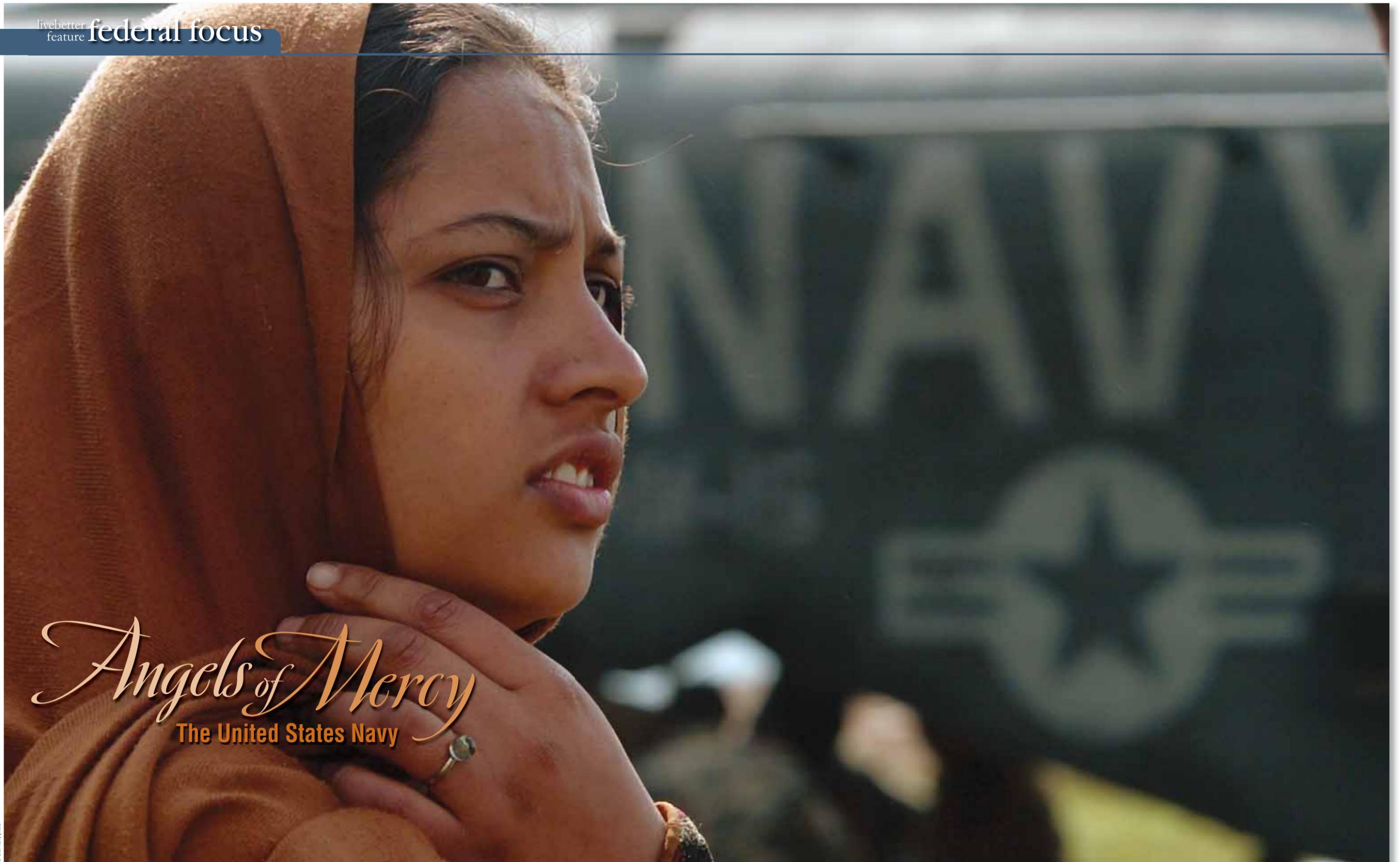


personal responsibility for their own risk.”

McMahon also stresses this critical issue by saying “Most of us own homes as the investment of a lifetime; and to own a home behind a levee, in a flood plain or on the shore and not protect it with flood insurance is really playing Russian Roulette with one’s greatest investment. Yet, I sometimes need to remind my own staff that they should buy flood insurance. The

consequences are ‘out-of-sight, out-of-mind’ until disaster strikes. People inherently underwrite risks when they ignore them and do nothing. People need to participate in the process by voting for officials who understand, communicate and appreciate the situation and by supporting bonds and investments that maintain and improve flood defense systems. Levees are just one of the components of our natural infrastructure that haven’t received enough attention in the past several decades. We cannot continue to operate on a reactive basis. These are large national policy questions; Congress and the administration will need to decide where to invest, how to invest, over what timelines to invest and in what infrastructure systems, to make us whole again.”

USAID agrees with McMahon’s, Galloway’s and Riley’s wake-up calls on all fronts. “To adapt to and mitigate natural disasters, climate variability and global climate change . . . managers must work on many fronts to ensure that economic and land-use policies and conditions are in place to guide appropriate private sector investment and resource use patterns. Inappropriate land-use zoning and perverse subsidies for disaster insurance must be replaced with measures and incentives to promote risk and vulnerability reduction and the restoration of healthy ecosystems.” Planning for a sustainable future requires a change in our current patterns and processes. By enacting new policy, requiring new standards and increasing education and communication on this vital topic, America and other nations can begin to mitigate the effects of natural disasters and, quite possibly, significantly reduce the death tolls, economic losses and environmental damage sure to come in this unstable, sometimes threatening and constantly evolving environment called “Earth.”



Angels of Mercy
The United States Navy

© U.S. Navy photo

Thirty days after the Kashmir Earthquake hit the isolated, mountainous region of Pakistan-administered Kashmir, an injured man hobbled into a U.S. disaster relief hospital near Muzafarabad, approximately 12 miles from the quake's epicenter. He had followed the "Angels of Mercy," the local Pakistani-nicknamed U.S. Navy helicopters (helos) that were making countless runs every day, day after day, to airlift food, medicine and supplies while shuttling people back and forth to safety. "Somehow he got down off the mountainside, hobbled in and walked past all the other hospitals in order to get to us. This guy had a compound fracture in his leg for 30 days. Our docs looked at it and couldn't believe it; they had never seen anything like it. They immediately took him into surgery, and they were there for hours just trying to cleanse his bones. He made it, thank God," said Rear Admiral Michael A. LeFever, Commander of Expeditionary Strike Group (ESG) 1 and Commander of the Disaster Assistance Center, Pakistan.

The Kashmir Earthquake occurred on Oct. 8, 2005 and registered 7.6 on the Richter scale. It claimed the lives of more than 75,000 men, women and children while leaving another 100,000 injured and 3.5 million homeless in one of the most isolated and desolate areas of Pakistan. "I was there with my group within 48 hours after the earthquake hit. We worked as one team with USAID (U.S. Agency for International Development) and other U.S. agencies, under the auspices of the U.S. Ambassador to Pakistan, to provide American support. We flew in a Level 2 hospital with medical capabilities, surgical suites, etc.



© U.S. Navy photo

We landed and worked with the government of Pakistan to provide food, supplies and medical assistance right off the bat and then immediately surged in another self-sustaining land-based hospital and 125 engineers from Naval Mobile Construction Battalion 74 (Seabees) who immediately cleared roads, set up shelters and built schools," LeFever explained.

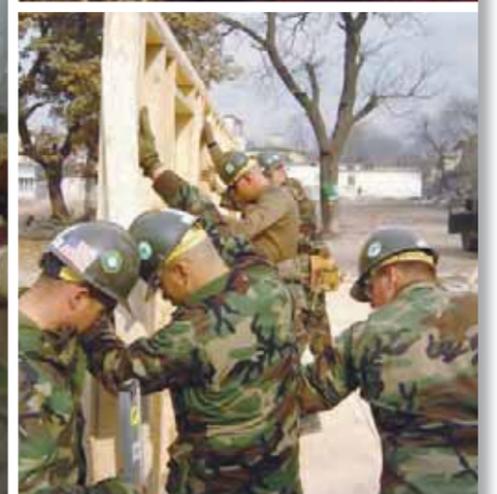
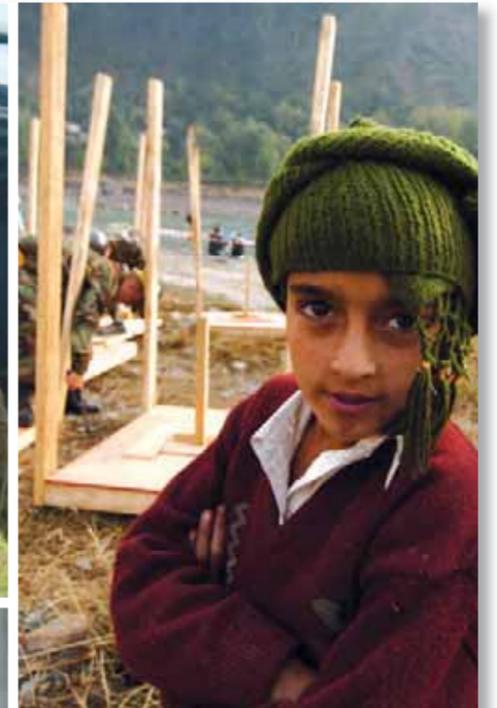
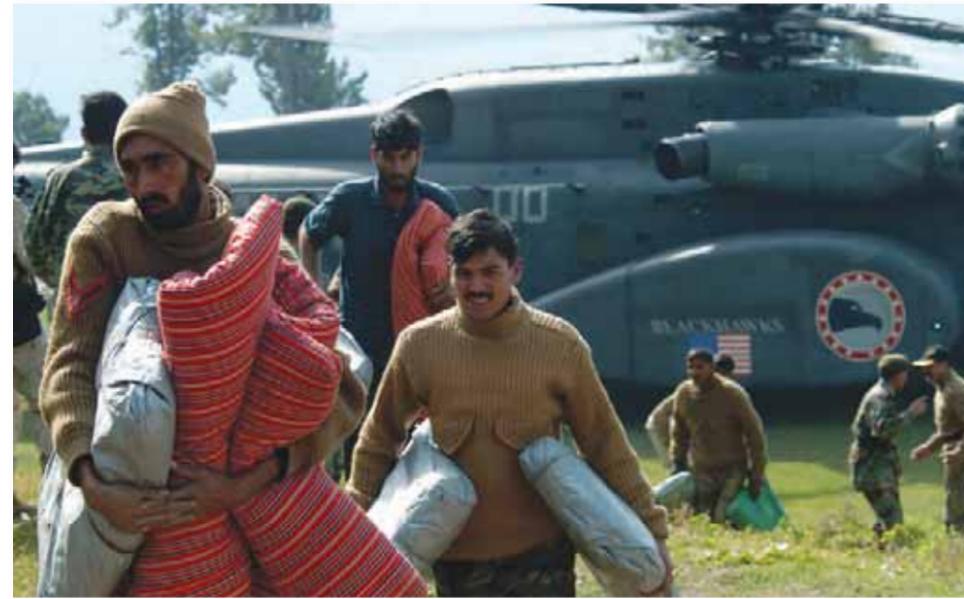
“**I just pulled up a ‘Boston General’ hospital and put it in an area where they had no medical facilities even close to this.**”

Prior to the earthquake, more than 80 Pakistani healthcare facilities existed in this area; however, the event destroyed all but two, and they could barely operate. The villagers weren't used to the quality and scope of American medical care: "I brought in the last MASH (Mobile Army Surgical Hospitals) – the 212, similar to the

one from the TV show – and we turned that over as part of the operation. And I also brought in a Navy Marine Corps hospital from Okinawa. We had 2 surgical suites, 24 intensive-care-unit beds, 36 medical-surgical beds and 60 medium-to-minimal-care beds. I just pulled up a 'Boston General' hospital and put it in an area where they had no medical facilities even close to this," continued LeFever.

According to estimates, the U.S. Navy's relief and follow-up efforts saved ½ million lives when factoring in the effect of winter's ravages. Even without a natural disaster, thousands of people die every winter in this harsh and isolated region. And in 2005 winter came very early. "Because the quake was in a very mountainous region, without the helo lift we provided, there would have been no way for medical or shelters to get into the region. Not only was it the medical – because we had medical cases of earthquake-related injuries for about the first month – but then we had primary care. And then we proceeded to do outreach and immunization. My thought was 'Oh, my goodness, first snowstorm . . . People will be without homes and freezing to death,'" remembered LeFever. But thanks to the Seabees' home building and generous international donations of shelters, as well as to the completion of all immunizations, the mortality rate was below anything the region had ever experienced. The combined effort was a huge success.

In addition, the work of the Seabees, along with the Pakistani government and other international organizations, in providing clean water and proper sanitation helped to avert disease outbreaks in refugee camps, where thousands of people were



© All photos U.S. Navy

living. According to LeFever, the sanitation, immunizations and healthcare averted outbreaks of cholera. “To be a part of that life-saving experience was incredible. For me, it was personally and professionally the most rewarding experience of my life,” the Rear Admiral remembered, his voice choked with emotion.

Creating Cultures of Caring

Ironically, many of the same Seabees who had experienced devastating personal loss as a result of Hurricane Katrina were on hand to support Pakistanis in their time of great personal loss. “The same Sailors who lost their homes in Katrina were later deployed in Okinawa. When the Pakistan earthquake happened two months later, we called them up and sent them right near the epicenter. So these same young guys and gals who lost their homes were rebuilding homes for the Pakistanis. And here our Sailors were reliving the environment that they just left in Katrina – a fact that was favorably reported in the Pakistani press. It was very emotional,” recounted LeFever.

— “ —
This demonstrates the remarkable ability of our military men and women to be in combat one day and then to immediately provide life-saving humanitarian relief the next day.
 — ” —

Moreover, the U.S. military sent in Army helicopters from all over the world for heavy lift because of the high altitudes of the Himalayas and Hindu Kush Karakoram Range. Some of these military personnel were literally being shot at the day before in



Afghanistan. “They flew through the Khyber Pass, and the next day these same crews were shuttling medical supplies and personnel up to the area and medevacing people back to Islamabad. This demonstrates the remarkable ability of our military men and women to be in combat one day and then to immediately provide life-saving humanitarian relief the next day,” beamed LeFever proudly.

Although the Navy was participating in a humanitarian mission, the environment was potentially hostile. “This was one of the things that I took into consideration as Commander – risk of force, risk to mission. We were on a humanitarian mission, and you can’t do humanitarian assistance with a helmet, gun and body armor. We just watched where we went,” recalled the Rear Admiral. LeFever elaborated by saying that there was never a concern about Pakistanis in the areas where they concentrated their relief effort. He explained: “They knew we were there to help so it was almost a pact. In other words, they took care of us; they made sure nothing happened to us. It was just incredible . . . Here were our Seabees up in a village trying to fix a collapsed building while the local people were scrambling through the debris of their lost homes and possessions. All of a sudden, they would walk off and, within 20-30 minutes, come back with some food and some tea prepared for the Seabees in an effort to show their appreciation. It was amazing . . .”

Building Relationships Through Compassion

Both Rear Admiral LeFever and Vice Admiral Michael K. Loose, Deputy Chief of Naval Operations for Fleet Readiness and Logistics, agree that the U.S. Navy’s humanitarian missions’ “leave-behind” has the greatest impact on the local people. “Whether it was in the Indonesian Tsunami or the Pakistan earthquake, every Sailor who had a capability applied it. Think of the image that it leaves of Americans. So now the key part is that a year or two later

© All photos U.S. Navy

© All photos U.S. Navy

this gigantic U.S. Navy hospital ship comes back and says ‘Knock, knock. We’re here. Who wants medical and dental?’ All of a sudden there are people crowding the gangway. In the meantime, we send Seabees forward to say ‘Let us help you with your schools, community centers, government buildings and basic utility services. How about getting more wells in here for your families, livestock and crops? What about better sanitation?’ So, all of a sudden, it’s ‘Wow! This is the U.S. Navy!’” said Loose.

The U.S. Navy/Marine Corps team is often the American government’s first responder because it’s a global, forward deployed force, around the world everyday, 24 hours a day, 7 days a week. Its “911” capability is enhanced by its strategic airlift, strategic sealift and ground capability. LeFever explained, “The U.S. Navy/Marine Corps team is like the ‘911’ guy. Because we’re forward deployed all around the world, we’re able to respond and to provide that immediate ‘triage.’ This is about relationships and relationship building, and this is about trust that you build over time. Because, as the Navy’s Maritime Strategy states, ‘Trust can’t be surged.’”



© U.S. Navy photo

Vice Admiral Loose continued: “So when you do dial 911 and need us to respond, the Navy/Marine Corps team is ready, scalable and task-organized. Put a guy like Mike LeFever on the ground, and he immediately says ‘This is what I need: platforms, ships, a hospital ship, 25 helos, some SatCom (satellite communications) and a bulldozer to clear the airport runway.’ And another thing: We have our ‘Seabees,’ who are skilled construction workers – utilitiesmen, engineering aides, electricians, mechanics, builders, steelworkers, equipment operators. It’s like going to the union hall and saying ‘Give me 10 carpenters,

10 steelworkers and 5 front-end loaders; and I need them in 10 minutes.’ We can do that. We’ll complete the job quickly and then extract ourselves out. But the most important thing we’re finding is that we need to come back in the future to build lasting relationships. In other words, we’re like the ‘shining knight’ on the white horse. However, that’s not enough if you never see us again, because you can’t surge trust, respect and friendship. The same thing is true once you build it.”

The Navy makes sure the “fires of friendship” continue to burn brightly thanks to the dedicated hospital ships USNS Mercy and USNS Comfort. Loose explained: “Our hospital ships, Mercy and Comfort, have really created an opportunity for us because they’re unobtrusive and neutral. They’re all about compassion. We really want to offer humanitarian assistance because when you look at human compassion on a global scale, this is an opportunity for us to step up to the plate. When called upon, our goal is to act quickly and in a big way because it’s a matter of lives.”

Partnering for Peace

Loose notes that the U.S. Navy is forward deployed for a number of reasons: global security, peace, stability and economic growth, in addition to America’s defense and national security. “We’re constantly focused on two things: One, if we have a war, we’ll do everything we can to win quickly and decisively because our sons and daughters are at stake, as well as America’s freedom and security. Two, Americans don’t want wars. So we need to concentrate on deterrence – in other words, preventing wars and conflicts – which is why we’re out and about every day, all over the globe.

“What happens if a foreign country has a disaster and the American military responds immediately with far-reaching, humanitarian relief? All of a sudden the relief recipients say ‘Wait a minute, the Americans answered the bell and made a dramatic difference.’



© U.S. Navy photo



© U.S. Navy photo

And from our participating Sailors’ perspective, this is the ultimate experience. They’ll remember their contribution to humanity for the rest of their lives. You get the picture just by watching Mike LeFever recount his time in Pakistan,” Loose continued.

“If you really have a problem or need help, Americans are the kind of people who’ll show up and make a big difference.”

LeFever agrees with Loose and believes that the Navy’s mission of caring is a viable war fighting strategy, as well as a key

formula for global stability, peace, freedom and growth. LeFever explained: “Because of our humanitarian involvement in other countries, we give people choices. I’ll be frank: When we were in Pakistan, terrorist-sponsored organizations were there. We were around the corner from them providing our services without hooks, and the Pakistani people realized that. Some of the terrorist-funded groups brought in some wonderful capabilities as well, in vans and vehicles, vying for that same ‘product’ – the hearts and minds of the people. Our concern, of course, was the future of these organizations and their hold on that area. That’s one of the reasons why American humanitarian aid is so important. It has a powerful impact on people, on relationships and on understanding what America is all about. We’re in Partnerships for Peace with our ships all over the world – in the Sudan, the West Coast of Africa, the Pacific, South America and in other countries. This type of engagement is now part of our normal routine.”

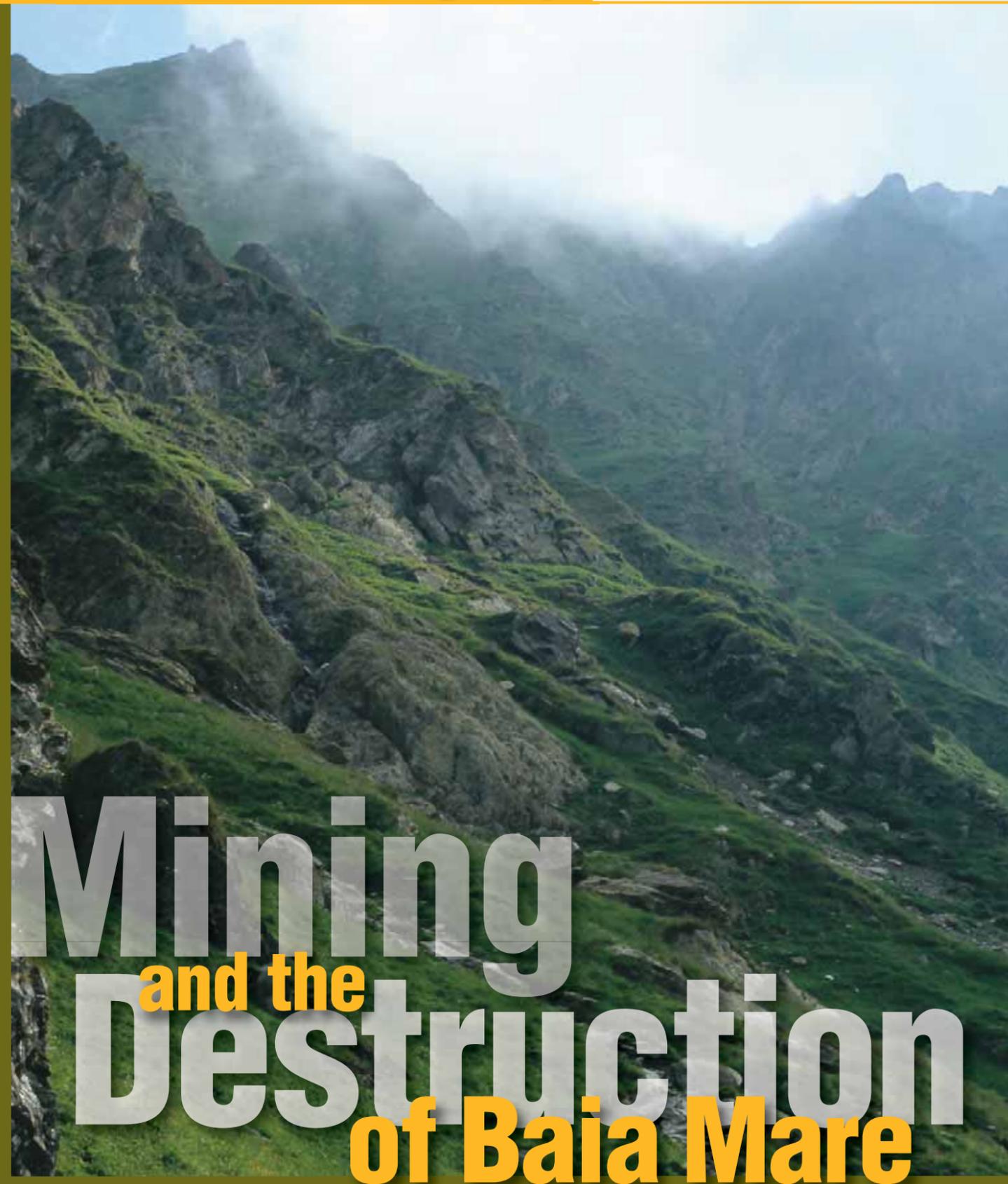
Proud To Be a Sailor

Loose is very proud of the Navy and its commitment not only to America but also to the rest of world. He summarized: “We’re very proud that we’re forward deployed. We’re out there every minute of the day, and we’re in the ready position at all times. We need to be out and about, and we need to be focused on the humanitarian compassion side as much as the warfighter side in order to build better relationships and trust around the world.

“Why does America care? I believe it really boils down to the human side of being an American. We’re a country with many blessings; and, we’re willing to share those blessings, as well as our time and our passion. We worry about other people and their welfare. The other thing is that within the Navy, as well as for other military services, you’re immediately taught selfless service – in other words, to put others ahead of yourself – and to rely upon each other. So this is the ultimate experience, I think, to take an American Sailor and say ‘Guess what? We’re going into Pakistan tomorrow. You’re going to leverage and force-multiply all your skills, discipline and capabilities and stretch them to your limits to save lives and to help fellow human beings.

“If you really have a problem or need help, Americans are the kind of people who’ll show up and make a big difference. We want people around the world to understand what we’re all about, which is exactly what happened in Pakistan and Indonesia. And that’s the goal the U.S. Navy is working hard to accomplish with its Maritime Strategy. We’re much more than ships, submarines and aircraft. Our number one seller is never our equipment. All we need to do is let a Navy Sailor, guy or gal, go out and show people who they are; and it’s ‘Wow! That’s what America is all about,’” concluded the 3-star Admiral, proud to be a Sailor, with a twinkle in his eye and a smile on his face. 🌿

Log onto www.centerforabetterlife.com for more info.



Mining and the Destruction of Baia Mare

More than 100,000 cubic meters of heavily poisoned water, rich in cyanide and other toxic heavy metals such as copper and zinc, spilled through a tailings dam breach Jan. 31, 2000, in Baia Mare, capital of Maramures County, Romania. The contaminants thus began their journey through the Carpathian Mountains en route to the Tisza River Basin. In a four-week period, the toxic plume, containing enough cyanide at the outset to kill one billion people, traveled 2000 km through Romania, Slovakia, Ukraine, Hungary and Serbia and Montenegro before entering the Black Sea. Further complicating the event, this area within the Carpathian Basin serves as Europe's last refuge for such diverse species as brown bear, wolf, lynx, European bison, moose, wildcat, chamois, golden eagle, eagle owl, black grouse and many unique insects.

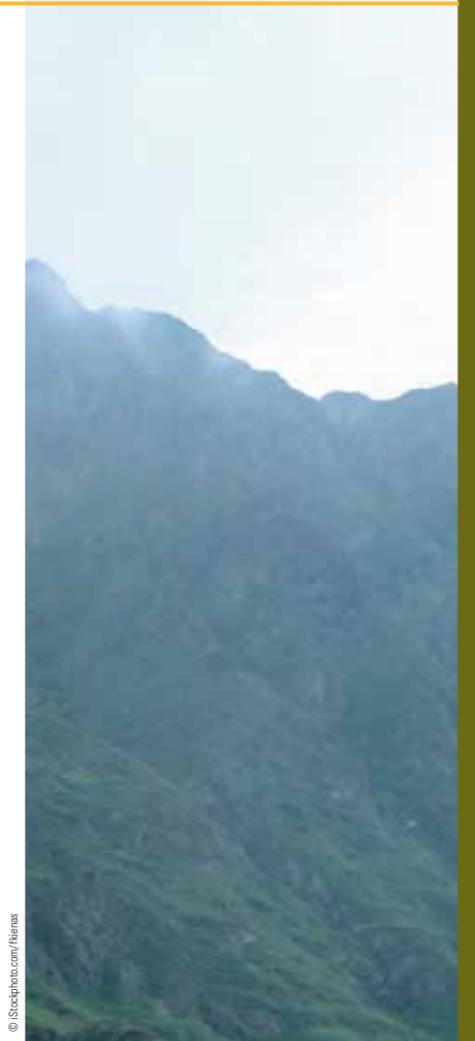
The catastrophic Baia Mare mining tragedy not only proved the potentially disastrous consequences of downplaying environmental risks for economic gain but also spotlighted transboundary water pollution. From the spill source to the intersection where the Tisza River finally enters the Danube River, the toxic plume killed all water plankton as well as 38 fish species totaling 1,240 tons. Following the accident independent tests conducted jointly by the United Nations Environmental Programme (UNEP) and the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) stated that wildlife mortality after the spill increased to as much as 100 percent for some species, such as otters and beavers. In addition, scientists found dead gulls, black cormorants, mute swans, foxes, roe deer, pheasants, pigeons and hares. The UNEP/OCHA team also pulled dead donkeys and horses out of the river; at least two endangered white-tailed eagles were found – one dead and one paralyzed. The spill's ecological consequences were so severe that less than a quarter of the pre-spill species survived to the summer of that year. And

flora, along and in the central part of the Tisza River, was also destroyed.

The Tisza River Basin wildlife was not the only victim of the toxic plume. The fishing and tourism industries were also crippled. In addition, contaminated drinking water became a major issue for villages near Baia Mare, including Bozanta Mare, which had 80 times the permissible cyanide level in its well water, according to a UNEP/OCHA report. Luckily, Hungarian authorities were able to prevent all contaminated drinking water from entering the two largest cities along the Tisza River. Ultimately, 2.5 million citizens in the two-country, 24-county area were seriously impacted by tainted drinking water, which increased costs for sanitation plants and industries because of public health production interruptions.

Life Before the Spill

Situated at Romania's northern border, Maramures County has been an important mining region for more than 2,500 years because of its abundant mineral resources. While the toxic spill's impact on Baia Mare had a disastrous effect, poor environmental conditions already had existed in the

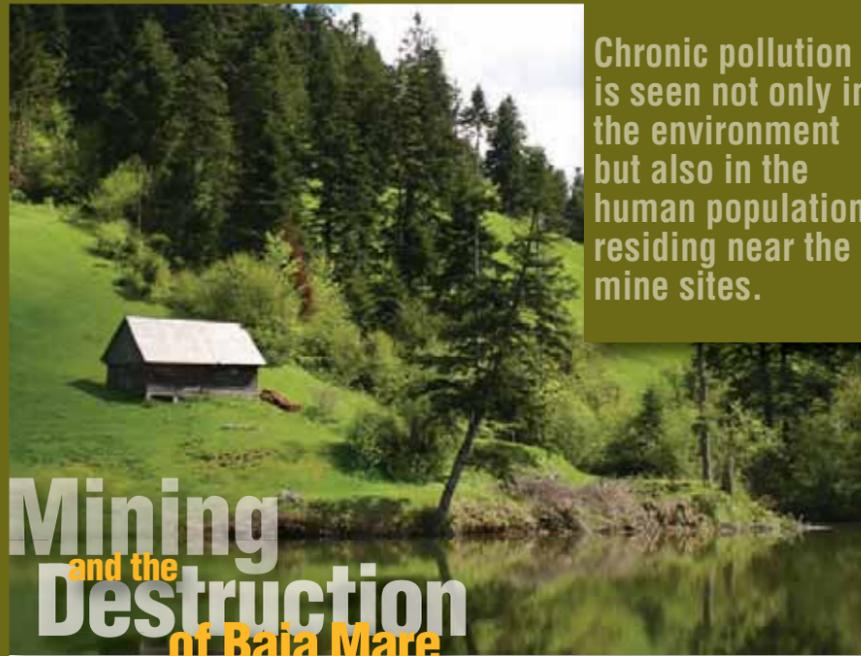


© Shutterstock.com/Henias

Contaminated drinking water became a major issue for villages near Baia Mare.



Photograph courtesy of Alburnus Maior



Chronic pollution is seen not only in the environment but also in the human population residing near the mine sites.

Mining and the Destruction of Baia Mare

Photograph courtesy of Alburnus Maior

area. According to Anamaria Bogdan, public relations and campaign manager for “Campaign for a Cyanide-Free Romania,” historical pollution, particularly with respect to water, is a great cause for concern. “The mining activities, as a result of the introduction of the cyanide-leaching process in the 1960s, have contributed to the creation of several tailings dams in the area and have posed a threat to the environment and to people as they are located quite close to inhabited areas.” Even prior to the 2000 catastrophe, Baia Mare was cited by the World Health Organization (WHO) as an environmental “hot spot” in its report titled *Concern for Europe’s Tomorrow*. For centuries the region’s environment and its river systems had accumulated toxic heavy metals, as well as persistent organic pollutants, such as those from a 150-year-old lead smelter. In fact, before the spill at Baia Mare, the Sars River, also known as the “Dead River,” showed cyanide concentrations nearly 88 times the permissible level with lead and arsenic in the Sars, Lupas, Somes and Tisza rivers documented at 100 to 1000 times above acceptable concentrations.

Chronic pollution is seen not only in the environment but also in the human population residing near the mine sites. In 1999 Romania’s Environmental Health Center staff, led by Eugen Gurzau, M.D.,

Ph.D., studied Baia Mare children ages 2 to 6 to assess the effects of long-term exposure to lead in the environment. Researchers discovered very high lead levels in the soil, air and water with blood samples revealing six times the safe level for some children. In addition, residents near mining areas were plagued with chronic respiratory disease and illness. In fact, life expectancy in Baia Mare is 12 years below the Romanian national average.

The Impact of Tailings Ponds and Dams

Romania’s inhabitants have mined gold since at least the first century A.D. However, because accessible gold had already been extracted by the 1990s, most mines were no longer profitable with the then-current technology. Leftover waste, mixed with cyanide and other heavy metals, was permanently disposed of as cheaply as possible, as is standard international practice, in tailings ponds and dams. In fact, the Environmental Protection Agency (EPA) listed an incredible 215 of these toxic ponds and dams in the area. Leftover tailings ponds and dams produce great concern not only because these potentially chronically leaking waste sites restrict expansion of urban development but, more importantly, because they are located near residential locales. Romania

experienced what could be considered a “new” gold rush in the late 1990s with the advent of new technology able to recover leftover gold and silver from old tailings sites. Numerous globally operated mining companies, usually in joint venture with formerly state-owned Romanian companies, had acquired licenses to revive old mining projects.

Over a seven-year period Aurul S.A., a stock company jointly owned by Australia’s Esmeralda Exploration Limited and by Romania’s Remin, obtained environmental permits necessary for production at Baia Mare in 1999. Claiming to use the most modern, safe and efficient technology available, the Aurul undertaking was projected to recover about 1.6 tons of gold and 9 tons of silver per year from existing tailings ponds for 10-12 years. Ironically, this effort to “clean” three highly toxic waste sites did not go as smoothly as anticipated. Baia Mare operations commenced in spring 1999 and, before the end of that year, two confirmed leaks had already occurred in the unprotected pipeline system that transported highly toxic cyanide material.

In addition, major errors occurred in actual construction of a new tailings pond: using light materials such as soil with a high proportion of sand, using a plastic lining not designed to deal with emergencies and not constructing the dam high enough or sturdy enough, according to a UNEP/OCHA team report following the accident. Just prior to the tailings dam breach, temperatures in Baia Mare remained below freezing for five weeks beginning Dec. 21, 1999. Even though operation of the tailings processing had stopped, a reported 60-70 cm of accumulated pond snow led to an uncontrolled rise in the water level. Because no mechanism to catch the wastewater overflow was provided in case of such an emergency, the water level in the tailings pond rose uncontrollably until finally overflowing the dam and washing away a stretch approximately 25 meters wide by 2.5 meters deep. Although Aurul was operating in line with government permits, according to the UNEP/OCHA report, the newly engineered dam system failed under circumstances easily foreseen.



© iStockphoto.com/greentice

In 2007 Romania joined the European Union (EU) and adopted the latter’s more stringent environmental standards. Now before new mining activity is allowed, an Environmental Impact Assessment (EIA) must be submitted to Romania’s Ministry of Environment. “There are only two mining prospects in Romania awaiting the necessary environmental permits to begin activities, one of which is Romaltyn, which would resume ore processing activities

with cyanide in Baia Mare at the exact same Aurul tailings dam that broke in 2000,” explains Bogdan. As if the Romaltyn threat were not significant enough, incredibly, only eight years later plans for Europe’s new, largest gold mine again worry residents of not only Romania but also of the neighboring Tisza River Basin countries.

Rosia Montana – The Next Baia Mare?

Located just south of Baia Mare, in the Apuseni Mountains of West Central Romania, is the village of Rosia Montana. The country’s oldest documented mining settlement dates back more than 2,000 years to ancient times when Romans invaded Transylvania in search of resources to rebuild their empire. Naming the area “Alburnus Maior” or “the big settlement,” the Romans extracted gold and other precious metals there. To date this area is still home to Europe’s largest gold-ore deposit. Now awaiting necessary permits to begin mining operations again in this area is Gabriel Resources, a Canadian company. Gabriel’s subsidiary, Rosia Montana Gold Corporation, has a 17-year lease on a mining field located in and around the village of Rosia Montana.

Opponents of Rosia Montana Gold Corporation’s project, primarily local villagers, stress the fact that they are not



Residents near mining areas were plagued with chronic respiratory disease and illness.

© iStockphoto.com/Pliz



Mining and the Destruction of Baia Mare

© iStockphoto.com/kenasa

against mining but rather against an irresponsible project that will destroy the environment and their town, as was the case with Baia Mare. If the project becomes a reality, it would be the largest opencast cyanide leach gold mine in Europe and would contain an estimated 300 tons of gold and 1,600 tons of silver. Gabriel claims the project “creates an opportunity to remediate past damage from the ravages of 2,000 years of uncontrolled mining, leaving the region’s rivers and soil ‘cleaner’ than we found them.” However, the mine is projected to be seven times the size of the Baia Mare project while introducing the cyanide-leaching process to the Rosia Montana mining site for the first time. This development would be situated along the Aries River, considered to be the most important water source in the region. The tailings pond for the project, located immediately above the town of Abrud, will contain waste consisting of cyanide and other destructive heavy metals such as lead, sulfur, iron, mercury, copper and zinc. The Aries eventually flows into the Danube River, which creates the potential for another catastrophic event involving the Tisza River Basin. This scenario is not unlike the Baia Mare tragedy.

While potential environmental consequences of this mine are daunting, so is the fact that, to begin excavation of the one-mile wide mine, displacement of the

entire Rosia Montana village and its 2,000 residents must first occur. According to Gabriel Resources, around half the residents of Rosia Montana have accepted land buy-outs. However, Alburnus Maior, a community organization founded in 2000 by local Rosia Montana property owners, has voiced their collective unwillingness to leave their land. Stephanie Roth, 2005 recipient of the prestigious Goldman Environmental Award for her efforts as Alburnus Maior campaign coordinator, claims that houses acquired by Gabriel



Photograph courtesy of Alburnus Maior

“If people have something else to live off, the mine becomes less and less important.”

are only a small percentage of the land the company actually needs to acquire. “When Gabriel Resources boasts about how many houses and properties they have purchased, they are lying by omission. If you look at what the company has actually purchased, it is only between 27 and 30 percent of the lands they need under the project footprint,” explains Roth. Alburnus Maior is opposed to the mine for not only environmental reasons but also for cultural and social reasons. According to Roth, Romanian people are averse to selling their land because, for them, ownership of land comes with great responsibility. “The locals of Rosia Montana have less problem selling their houses because they can rebuild a house anywhere, as people in Romania tend to be very skilled. However, they are reluctant to sell big chunks of land because they see themselves as stewards to this environment and, for them, land is a question of security.”

Romania’s most prestigious scientific organization, the Romanian Academy, stated its opposition to the Rosia Montana project in 2003 and reaffirmed its position in 2006 after deciding the mine would not bring sustainable development nor solve

the area’s social and economic problems. As a result of this and other efforts, the area’s land use plan was returned to “inhabited” status, meaning its residents could once again open new businesses. Working to stimulate the local economy, Alburnus Maior has been active in assisting local families as they develop and fund their own companies. “If people have something else they can live off, the mine becomes less and less important,” claims Roth. Regardless, Gabriel Resources is continuing its quest to attain the required land. Legally, the area’s archaeological significance is its biggest hurdle. Because Rosia Montana contains historical artifacts unique to the world, it is considered to be Romanian cultural patrimony protected under the national interest. As a result, the state has required the mining company to ensure that the area is free of such artifacts. A huge scandal erupted when a Gabriel Resources archeological team claimed to have found nothing of value in the mountainous area containing the most gold. This assertion resulted in the release of the particular land parcel to Gabriel. In fact, it contained some of the world’s most unique archaeological findings dating back to Roman and pre-Roman times. According to Roth, after the de-protection certificate was granted to Gabriel, a CD containing the area’s actual documented findings was sitting outside the door of the Alburnus Maior headquarters. This unexpected event resulted in a court decision to return the de-protected area to its former protected status under Romanian law.

In September 2007 the Romanian Ministry of Environment decided to suspend the review process of Gabriel’s Environmental Impact Assessment. Without EIA approval Gabriel is blocked from mining in Rosia Montana. “If you look at the activity of Gabriel Resources in Romania in the past three years, it has nothing to do with any actual mining activity. Rather, it has been centered around making ads on television to promote the mine,” explains

Roth. As far as she and other united Alburnus Maior landowners are concerned, the mine at Rosia Montana will never be a reality because their refusal to surrender their properties is without compromise. Still, Gabriel Resources maintains the project will be the first approved under the European Union’s more stringent environmental laws. In addition, it has been rumored that Newmont, the Denver-based American mining giant, which at one point had as much as a 20 percent stake in Gabriel Resources, will buy out Gabriel if the necessary production permits are secured at the Rosia Montana mine.

While it is difficult to imagine a world without mining, it is imperative that people, particularly Americans whose civilization is based on material wealth, begin to rethink what they need to take from the earth. In the process they should redefine

the acceptable risks in doing so. According to Bogdan, more sustainable forms of mining are available, but companies are unwilling to invest in these more expensive technologies because of reduced profits. So the question quite simply is “What is more important to humanity’s survival: material wealth or the health and welfare of the world’s ecosystems that sustain us all, regardless of where we live?” With this perspective in mind, making and supporting the “right” decision becomes easier. 🌱

For more information about Alburnus Maior and to help the people of Rosia Montana secure a more sustainable life, please go to http://www.rosiamontana.ro/index_en.shtml.

To support sustainability and to learn more about Rosia Montana as well as about sustainable mining, please log onto www.centerforabetterlife.com.



© iStockphoto.com/remasan

COASTAL EROSION AND THE THREAT TO KIVALINA, ALASKA

In 1953 the Bureau of Indian Affairs permanently settled an otherwise nomadic, federally recognized tribe of Inupiat Native Alaskans onto an 8-mile-long barrier reef between the Chukchi Sea and the Kivalina River, approximately 600 miles northwest of Anchorage. The 54-acre barrier island became home to the city of "Kivalina," which was originally comprised of less than 400 residents, a few residential sod houses, a new school, an armory, an airstrip and a few churches. Life moved forward over the next 30 years, and development ensued for the subsistence village. However, by the late 1980s coastal erosion had reduced the island to only 27 acres, and the natives, to a life of fear and uncertainty, explained Janet Mitchell, City of Kivalina administrator. In

fact, previously unaffected beach-front land is now being lost through accelerated erosion – thanks to climate change, which is threatening the community's safety while creating an urgent need to relocate the city.

"A 2006 technical analysis study conducted under the Alaska Village Erosion Technical Assistance Program (AVETA) found that Kivalina, Newtok and Shishmaref are the highest priority (of the approximately 200 endangered villages) for attention. Each has an estimated 10-15 years before erosion impacts critical infrastructure, and the cost to move each village would range from \$80 million to \$200 million," says Colonel Kevin Wilson, Commander of the U.S. Army Corps of Engineers (USACE), Alaska District. The AVETA analysis also concluded that "a single

storm can now cause up to 15 feet of land to be eroded." Brigadier General John Peabody, Commander and Division Engineer, USACE Pacific Ocean Division, points out, "The fundamental challenge is that no federal mechanism or other reliable resource capability exists to provide a response appropriate for the magnitude of the problem." To put this into perspective, the USACE has less than \$5 million in 2008 appropriated federal funding to address coastal erosion in Alaska, which encompasses 50 percent of the U.S. coastline. Peabody has remarked, "This year we're focusing nearly all available money on building up protection for Kivalina because it is one of the villages in the greatest immediate danger of being destroyed by a significant storm."

“We’ve been noticing changes to the environment over the past several years. The way we live depends on the environment and what it provides for us in terms of food and sustenance.”

Facts and Figures

The AVETA analysis, as well as a December 2003 Government Accountability Office (GAO) report titled *Alaska Native Villages: Most are Affected by Flooding and Erosion, but Few Qualify for Federal Assistance*, states that rising global temperatures are affecting the thickness, extent and duration of sea ice forming along the western and northern coasts of Alaska. Loss of sea ice leaves coasts more vulnerable to waves and storm surges – major causes of erosion. In fact, National Oceanic and Atmospheric Administration (NOAA) scientists are trying to find out why the Arctic region “is warming – and the summertime sea ice is melting – faster than predicted.”

“The Arctic is changing before our eyes,” says A.R. Ravishankara, director of NOAA’s Earth System Research Laboratory’s chemistry division. “Observations from instruments on the ground, balloons and satellites show the Arctic is warming faster than the rest of the globe. Summer sea-ice extent has decreased by nearly 40 percent compared to the 1979-2000 average, and the ice is thinning,” NOAA researchers explain.

“Dramatic changes to the lives and livelihoods of Arctic-living communities are being forecast unless urgent action is taken to reduce greenhouse gases . . . it is likely that, in order for Arctic communities and cultures to survive and to conserve their centuries-old ways of life, decisive emissions reductions will be needed alongside adaptation to the climate change already underway,” the United Nations Environment Programme’s Intergovernmental Panel on Climate Change (IPCC) has announced. Likewise, the U. S. Geological Survey



© Photograph: Janet Mitchell



© Photograph: Janet Mitchell

(USGS) explains that villages like Kivalina used to have a natural protection against erosion because “colder climates can reduce beach retreat during the winter when sea ice forms along beaches and acts as a buffer. The beach itself can also freeze providing additional protection from wave action. Along much of the coast of Alaska, the sea used to be covered by ice more than half of the year, reducing the annual rates of shoreline retreat. . . Significantly increased global temperatures extend the season of ice-free ocean, thus providing greater opportunity

for storm influence and possibly greater land loss.”

Impacts and Effects

Kivalina is dealing with these impacts first-hand. “We’ve been noticing changes to the environment over the past several years. The way we live depends on the environment and what it provides for us in terms of food and sustenance. Because we harvest seasonally, we’ve noticed that some harvesting seasons were starting earlier than normal. It wasn’t something that caused a whole lot of concern at first; we just had to adapt or miss the season. With the erosion problem, changes have happened rather suddenly. We battle Mother Nature, and we lose each time. And now, our people have lost their peace of mind. We’re afraid now when we get our fall sea storms. In the past the sea would freeze without fail (beginning in October) and provide a natural buffer to the coastline, protecting it from the vicious fall and winter storms that affect this area naturally. Now, due to the changing climate, the seas are sometimes not completely frozen even in the middle of December.

Thus, the land has become vulnerable to the pounding forces of the storm-swept seas. As a result, the people have become fearful . . . it’s been most devastating since 2004,” explains Colleen Swan, Kivalina’s tribal administrator.

“We haven’t had anyone that we could turn to who could help with our problem, other than the U.S. Army Corps of Engineers, to help us design an erosion control project,” Swan continues. “With any operation in the government, there are processes that must be followed, but we’re

losing land while their processes play out . . . the solutions that the Army Corps is working on are temporary in nature. Even if we do have erosion control projects coming in, that’s going to hold us over only until we’re able to move our village. Consistently, federal government agencies have told us that Congress will not fund a project like that because it is going to cost too much. I don’t know how bigger cities get money for their projects. We don’t have resources to pay for relocation because we don’t have a cash economy. For us to build a cash economy, we must move the village because it’s too small and there’s no room for growth or economic development. In the meantime, our village is eroding and peoples’ lives are in danger.”

Wilson shares his perspective: “Yes, there is a need for protection against coastal erosion in these villages, but it’s a challenge . . . When it comes down to it, on a national level, getting appropriations is a tough fight considering the investment involved is for only 400 people. . . . When you look at these scenarios, you really have to think broadly, and this involves everyone from the community on up. You have to find a suitable site. One challenge is, in order to support

the village’s subsistence lifestyle of hunting and fishing, the community wants a location that is readily accessible to water – putting them into low-lying, high-risk areas. Conversely, if they move to high ground, they’re faced with freezing winds that can create an unbearable situation. I can make recommendations and talk about the associated risks; but, ultimately, these decisions must be made by the community and borough.”

The USACE continues to help Kivalina by using most of its limited Congressionally appropriated funds in the form of rip rap rock revetment. Wilson remarks: “Basically, large rocks that weigh several tons are laid down in layers, creating a gradual slope up from the water. It’s not going to hold back the water, but it’s going to dissipate the energy of the waves. Based on our analysis, rip rap lasts 15 to 20 years. We just awarded a contract to do 400 feet of rock revetment with options to expand that in the future, pending further availability of funding. This funding is a large portion of the \$4.9 million that Alaskan Sen. Ted Stevens was able to have appropriated for the project . . . Back in 2006, the USACE used its limited emergency authority when Kivalina’s eroding shoreline threatened fuel tanks, and we were

able to bring in about 10,000 supersacks, one-to-two-cubic yard sandbags, as well as three pieces of heavy equipment and a maintenance plan to maintain it. You can buy time with these methods; but, ultimately, we can’t control erosion 100 percent. . . We’ve protected Kivalina’s fuel tanks because we wanted to avoid any kind of fuel spill on top of the already threatening coastal erosion. However, it basically buys them only enough time to get through the next storm.”

Thoughts and Solutions

Wilson adds, “In the past, it’s been hard for the Corps to argue a federal interest in cases like this when the state is not engaged as well. To Sen. Stevens’ credit, he’s worked very hard to get some authorities and funding brought to the state.” Wilson continues: “It’s reassuring to see that, under Alaska Governor Sarah Palin’s new administration, a sub-cabinet has been formed to deal with climate change. It has reviewed the communities facing coastal erosion and makes recommendations and tasks agencies at the state level to take responsibility. Based on the actions of the sub-cabinet, the state is looking at these issues and studying possible solutions. There’s about \$12 million of work that’s mentioned in the sub-cabinet for climate change’s final report, which is available online at www.climatechange.alaska.gov.”

Major General Don T. Riley, Deputy Chief of Engineers and Deputy Commanding General of the USACE offers some creative insight into possible solutions for Kivalina. “I took our coastal engineer research board to Alaska two years ago, and we looked at Kivalina, Newtok and Shismaref,” Riley recalls. “Taking a systems viewpoint on Kivalina, you realize it’s a very, very narrow barrier island; and, with climate variability and sea level rise, that situation is just going to get worse. By taking this system perspective rather than just a Kivalina project perspective, it allows you to do a lot of things: One option is to adjust the federal and state laws. Another option is to construct facilities that are mobile or not



© Photograph: U.S. Army Corp. of Engineers

quite so permanent at less cost . . . Let's take a long-term view; and if they want to be nomadic tribes, let's figure out how to let them do that. Or, if they don't want to do that, if they just want to find safe ground, let's move them to safe ground. And in the interim, protect them and not just with sandbags. Sandbags, even the monster 2,000-pound sandbags, are like peanuts compared to waves up there. They move; and, within a couple of hours, they're gone. What the Corps is working on is a statewide system for the Alaskan coast. I think there are ways to tackle this problem in the long run and not just by putting bigger rocks on the coast to protect them because that's not sustainable."



© Photograph: U.S. Army Corp. of Engineers

Lieutenant General Carl A. Strock, now retired Chief of Engineers and Commanding General of the USACE, agrees with Riley. "There needs to be some room in the statutes and regulations to allow for the Corps to help in situations like this," Strock says. "The Corps has actually moved cities in other circumstances. Coastal erosion would require special legislation. I know it's a dire circumstance . . . There are mechanisms to get around the problems. I would venture to say that if you asked how much the federal government is paying out to subsidize insurance along our (remaining) coastline, it would dwarf what it would take to fix Kivalina. There is a component of social justice that should be considered in all of this."

In the meantime, Kivalina has taken a historically significant, proactive stance with the help of the Center on Race, Poverty & the Environment, headquartered in California, and the Native American Rights Fund, located in Alaska. On Feb. 27, 2008, the Native Village of Kivalina and the City of Kivalina filed a civil complaint in California for damages against Exxon Mobil, British Petroleum (BP), Chevron, ConocoPhillips, Shell, Peabody Energy, The AES Corporation, American Electric Power, DTE Energy,

Duke Energy, Dynegy Holdings, Edison, Midamerican Energy, Mirant, NRG Energy, Pinnacle West, Reliant Energy, The Southern Company and Xcel Energy. The civil action aims to ". . . recover damages from global warming caused by the defendants' actions . . . defendants contribute to global warming through their emissions of large quantities of greenhouse gases. Defendants in this action include many of the largest emitters of greenhouse gases in the United States . . . Greenhouse gases trap atmospheric heat and thus cause global warming. Global warming is destroying Kivalina through the melting of Arctic sea ice that formerly protected the village from winter storms. The result of the increased storm damage is a massive erosion problem. Houses and buildings are in imminent danger of falling into the sea as the village is battered by storms and its ground crumbles from underneath it."

Wilson, advocating another type of forward-thinking, proactive stance, comments: "The solution to coastal erosion is not solely a federal government or a local community responsibility. It really must be a collaborative effort of all those involved – coming up with solutions that require innovative thinking and a paradigm shift. Everyone needs to get involved with this, thinking through and being

flexible with a lot of different alternatives. . . We've got to figure out how we protect the environment, the Native culture, and still come up with a sound solution that doesn't create more problems down the road. This means collaboration between different agencies and groups involved up and down – federal, state, local and non-governmental organizations (NGOs). It works when the local community stays in charge. It doesn't work well when the federal or state government tells a local community how to live. This puts a lot of responsibility on the local community to make a lot of their own decisions."

If Kivalina's California lawsuit is any indication, it seems the community is beginning to accomplish just that.

One Final Note

The Alaska Climate Impact Commission states that "global climate models have projected that the Arctic is an area where changes to the climate may be the largest in the world. . . mean surface temperatures have already increased 3-5 degrees Celsius . . . The extent of Arctic sea ice reached an all time low in Sept. 2007, shattering the previous record in 2005 by 23 percent." The Arctic Climate Impact Assessment warns that "these changes in the Arctic provide an early indication of the environmental and societal significance of global warming . . . These changes will, in turn, impact the planet as a whole. For example, climatic processes unique to the Arctic have significant effects on global and regional climate . . . melting of arctic glaciers is one of the factors contributing to sea-level rise around the globe . . . For this reason, people outside the Arctic have a great stake in what is happening there." 🌿

For more information about Kivalina, the Arctic and sustainability, log onto www.centerforabetterlife.com. Support sustainability. Become a member; it's free. And sign up for a paid subscription to *livebetter* magazine to help us grow.



AMERICA'S FIRST STEWARDS

WE'VE LIVED HERE FOR THOUSANDS OF YEARS.
OUR ANCESTORS TAUGHT US THAT OUR PEOPLE, CULTURES AND ECONOMIES ARE ONE.

WE RESPECT AND HONOR OUR RESOURCES BY MANAGING THEM TO MAINTAIN THEIR HEALTH AND PRODUCTIVITY. TO US, SUSTAINABILITY IS NOT A SLOGAN; IT'S OUR WAY OF LIFE. WE CARE FOR THE LAND, AIR, WATER AND ALL THINGS THAT WALK, FLY, SWIM, CRAWL OR GROW ROOTS. IT'S OUR RESPONSIBILITY TO THE GENERATIONS THAT FOLLOW.

SEEK PARTNERSHIPS WITH AMERICA'S FIRST STEWARDS.
WE HAVE MUCH MORE TO OFFER THAN JUST TIMBER.

INTERTRIBAL TIMBER COUNCIL
1112 N.E. 21ST AVE., SUITE 4, PORTLAND, OREGON 97232 · PHONE: (503) 282-4296
FOR MORE INFORMATION ON THE INTERTRIBAL TIMBER COUNCIL GO TO WWW.ITCNET.ORG



1. Elmwood Reclaimed Timber

Elmwood Reclaimed Timber Inc. manufactures and markets the highest-quality reclaimed wood products, which adhere to standards embracing the company's deep respect for the environment. Every product created by Elmwood, including wide plank flooring, countertops, beams and cabinet lumber, has been made by using wood salvaged from sustainable sources. All antique reclaimed timber is old-growth wood harvested from the original, unaltered forests that were standing before settlers arrived. Out of respect for cultural heritage and architectural history, only structures that are condemned, abandoned or beyond repair are deconstructed. Elmwood Reclaimed Timber just had a portion of its products gain the designation of Forest Stewardship Council-Recycled accreditation. The recognition adds validity to an already green team, which is working on having other inventory items similarly cited. To find out more, visit www.elmwoodreclaimedtimber.com or call 816-532-0300.

2. Bazura™ Bags

Bazura™ Bags is a social entrepreneur proving that one person's trash is another's treasure. This Toronto-based company has launched a line of high-quality bags and accessories handcrafted by a women's cooperative in the Philippines. They use colorful discarded juice containers and tons of pre-consumer waste that would otherwise clutter landfills, fields and streets in their communities. Every day children from local schools collect more than 50,000 used drink containers called "doy packs" and sell them to the co-op. By transforming "basura," the Filipino word for "garbage," into unique collections of eco-chic bags and other accessories, virgin material resources that had been previously used to make similar products are conserved. The company is committed to giving garbage a new life as fashionable bags and accessories support the environment and fair trade. To find out more, visit www.bazurabags.com or call 705-741-4733.



Five Products
you should
Check out

3. Looolo Textiles

Because the textile industry is one of the largest environmental polluters, Looolo Textiles wants to address the issue to effect global change. The name "Looolo" is a visual representation of "100 percent," symbolizing the company's commitment to sustainability in every aspect of the design process. From the choice to use organic materials for production to consideration of the environmental footprint that the products leave at the end of their useful lives, Looolo is revolutionizing the textile industry with its sustainable solutions. These organic, biodegradable interior furnishings are lined with organic cotton filled with kapok from the Malaysian rainforest and are available in a full range of colors. To find out more, visit www.looolo.ca or call 514-880-6560.



4. TWIST

Almost every product in the cleaning aisle has undergone some kind of evolution while sponges have been the same for decades. In 2006 founders of TWIST set out to turn the world of cleaning products on its head by combining design and environmental responsibility to create functional, beautiful and responsible alternatives that are more durable and longer lasting. One TWIST European Sponge Cloth is equivalent to 17 rolls of paper towels and lasts 25 times as long as a traditional terrycloth bar rag. Not only are TWIST products 100 percent biodegradable, but the packaging is earth-friendly and recyclable. TWIST packaging is a paperboard box that can be turned into a bird feeder. How's that for a twist? To find out more, visit www.twistclean.com or call 303-443-9953.



5. Klean Kanteen

Bottled water now costs more than gasoline; and while tap water is making a comeback, there is growing concern about the impact certain hard plastic reusable bottles may have on long-term health. Klean Kanteen, an industry leader in lightweight, stainless steel bottles, has developed sleek alternatives to leaching plastic and potentially hazardous epoxy-lined aluminum bottles. The company makes the bottle of choice for eco-conscious and health-conscious consumers. A Klean Kanteen is made of electro-polished stainless steel, which is lightweight, durable, non-leaching and toxin-free. Now launching a full collection of colored bottles, including a pink "renewal" bottle that will benefit breast cancer research, Klean Kanteen also offers a children's 12 oz. Sippy Cup, an 18 oz. cup, a 27 oz. cup, a 40 oz. size and a full range of cap options. To find out more, visit www.kleankanteen.com or call 530-345-3275.

CARPET IS NOW SO GREEN, YOU ALMOST HAVE TO MOW IT.

WHEN IT COMES TO "LIVING GREEN," TODAY'S CARPET HAS IT COVERED—INDOORS AND OUT.

Look for the Seal of Approval from the Carpet and Rug Institute (CRI) when choosing carpet cleaning products. Because the seal certifies products proven to improve indoor air quality while also keeping your carpet investment in peak condition.

And for proof that today's carpet industry is committed to green practices, consider this: we reused, recycled and reclaimed more than 261 million pounds of carpet in 2006 alone, keeping waste out of landfills and preserving natural resources.

Visit carpet-rug.org to learn more. Because today's carpet comes in every shade you want—and every one of them is green.

carpet-rug.org



Stripping Stain with Corn Cobs and Black Walnut Shells



In the past decade a revolutionary method has surfaced to strip old stain from any exterior wooden structure. This sustainable practice, called "media blasting," has evolved to include various options, including corncobs, black walnut shells and glass beads. Professionals have incorporated such technology in removing "failed" stain from log structures and, therefore, have strayed from traditional use of harsh chemicals. According to Dave Hoffman of Log Building Solutions, chemicals used in the restoration industry are not environmentally friendly. "The problem with chemicals is that they go everywhere so not only do you have to worry about plants and the surrounding landscape but also nearby water sources," Hoffman said.

A popular form of media blasting, known as "corn cob blasting," uses certain parts of a corncob to strip "failed" stain from any wooden exterior. Functioning almost like an hourglass, the corn media poured into a pot flows downward through an air compressor and gets smaller and smaller until air hits the mixture from the side. Corn fragments are then directed through a 20-foot hose until finally shooting from a nozzle to effectively strip the finish. "I still get a kick out of seeing it work every time," exclaimed Wally Young of Log Home Medics, a Log Building Solutions' contractor. "You see a house that just looks really bad; but, once you go in and media blast, you basically have a new home." Even a new house can be lightly "cob blasted," which allows it to be better prepared for staining.

While both corncob fragments and glass pellets are equally sustainable solutions, some prefer glass pellets because they turn to dust on impact. On the other hand, corn fragments are still visible after a house is blasted. "You could walk around in your bare feet, and it wouldn't even matter with glass pellets," explained Young. In addition, pellets are derived from glass bottles that would normally have gone into landfills. Still, corncob blasting has an added bonus: Leftover corncob fragments can be collected and reused on other building exteriors two more times.

With the variety of sustainable options, though, a homeowner can media blast just one time and, with proper maintenance, never need to do it again. For more information on Log Building Solutions, please go to www.logbuildingsolutions.com or call toll-free 800-284-6520. 🌱

Log onto www.centerforabetterlife.com. Become a member; it's free. Be an advocate, and support sustainability.



Heeding History's Message in Southwest Alaska

By Tim Troll, Executive Director
Nushagak-Mulchatna/Wood-Tikchik Land Trust

Barely a decade after Lewis and Clark began their historic exploration of what is now the Western United States, the first expedition into Southwest Alaska embarked from Kodiak Island. Leading the party were two Russian American Company employees, Peter Korsakovskiy and Fedor Kolmakov. These men were charged with finding new territory to enhance the company's fur trading portfolio. They were looking for beaver and found lots of them.

Imagine for a moment that these four explorers were able to return to the 21st Century and to the country they first saw approximately 200 years ago. Which pair would be more surprised: Lewis and Clark (because so much had changed) or Korsakovskiy and Kolmakov (because so much remains the same)?

"Change" is the operative word. In the short span of two centuries we have scarred, gouged and paved much of the landscape through which Lewis and Clark travelled. The Native peoples that these men encountered are gone or reduced to reservations. The wildlife they observed and hunted is all but obliterated. The great Columbia River salmon runs are but a trickle of their former strength. And even that trickle is artificially maintained by hatcheries and millions of dollars' annual expense to convey the few salmon that do return



© Robert Glenn Ketchum

...we must alter our attitudes about the inevitability of change.

near the dams supplying electricity and water to millions of people that now populate the Pacific Northwest.

Change has not overlooked Southwest Alaska; but, in terms of land and its natural resources, that change has been gentle. It is still possible to follow the two Russian explorers' journals and to camp in the same locations, to look out upon the same wild and unaltered landscape, to hear the same Native languages spoken there, to observe the same wildlife and to catch wild salmon from the same streams that nourished their expedition.

Drastic changes like those that decimated Lewis and Clark's country, however, are looming over Southwest Alaska. The world's largest open-pit gold and copper mine is now in the planning stages for the headwaters of the largest wild salmon nurseries remaining on earth – the Nushagak and Kvichak Rivers. Oil exploration is also under consideration for these same great rivers' offshore waters. Post-Lewis and Clark Pacific Northwest history suggests that if large-scale industrial development of this kind does not doom wild salmon, it leads to other changes that will.

Two recent issues of *livebetter* magazine (Jan/Feb '08 and Apr/May '08) featured photographs and stories about Southwest Alaska. The latest issue highlighted photographer Robert Glenn Ketchum, who has used his artistry to document the natural world and the disturbing changes we humans have imposed on our environment. If we heed Ketchum's message, which is really nothing more than a history lesson, we must alter our attitudes about the inevitability of change. For Southwest Alaska and for other parts of the world like it, that message is "enough!"

The Nushagak-Mulchatna/Wood-Tikchik Land Trust in Dillingham, AK, raises money to purchase conservation easements that will protect Southwest Alaska's wild salmon habitat. To learn more and to help save the world's last great salmon fisheries, please call 1-907-842-2832 or go to www.nmwtlandtrust.org.

To support sustainable living, log onto www.centerforabetterlife.com and become a member; it's free. You may also voice your concerns about sustainability, and we'll forward your comments to the appropriate Washington, D.C. representatives.



WOOLRICH®

EST. 1830

For more than 175 years Woolrich has offered products inspired by the outdoors and designed for your life. To see our complete line of apparel for men and women, blankets, furniture and accessories, visit us online at www.woolrich.com. Call 1-800-966-5372 to request a free Woolrich mail-order catalog.



Designed for your life.



Every drop counts.

Water conservation solutions come in all shapes and sizes.
One thing is certain: every drop (and flush) counts.



www.falconwaterfree.com

Falcon Waterfree urinals are an elegantly simple technology that saves 100% of the water that would otherwise be needlessly flushed down the drain. This also saves energy associated with the transport and treatment of water.

Visit our Global Water Action Center for tips and resources: www.falconwaterfree.com/action