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BUSH-CHENEY NATIONAL ENERGY POLICY

In May 2001, Vice-President Cheney presented the report of the National Energy Policy Development Group (NEPD) to President Bush. The report outlines five general goals:

1. Modernize conservation;
2. Modernize our infrastructure;
3. Increase energy supplies, including renewables;
4. Accelerate the protection and improvement of our environment;
5. Increase our energy security.

The concept was to inventory resources, infrastructure, and anticipated demands and propose policies that would "promote dependable, affordable, and environmentally sound energy for the future." The 170-page document steps through the issues through eight chapters.

The document begins with "Taking Stock" – an assessment of energy supplies and demands. The major conclusion of this chapter is that neglect of the energy infrastructure has led to an increased reliance upon foreign energy sources. In order to reverse these trends, a combination of energy efficiency, conservation, and increased production is necessary. The first two, the report asserts, are controlled primarily by market forces, and the remainder of the report focuses heavily on increased production and development of resources.

Chapter two is "Striking Home" – focused on the impacts of high energy prices. Their key recommendation is development of educational programs related to energy development and use. These programs should be long-term and funded and managed by respective energy industries (i.e., not the government), and should include information on environmental effects. The government can be effective through increasing low-income assistance and weatherization programs. The key conclusion is that supply and demand must be balanced through a combination of efforts, otherwise limited supply translates to higher energy costs, which leads to inflation, higher interest rates, and slower economic growth.

The third chapter focuses upon "Protecting America's Environment". The NEPD points out that shortages often lead to short-term waivers of environmental regulations and reliance upon older, dirtier energy sources. Technology can be employed to reduce the levels of pollutants and to increase efficiency. They also praise the success of flexible, market-based incentives, such as the EPA Acid Rain Program and the 1990 Clean Air Act Amendments. They advocate extension of these incentives to cover multi-pollutant legislation. The chapter includes some concepts that are highly relevant to geosciences research:

- "Solar and wind energy systems will continue to improve with advances in short-term weather and climate forecasting. Improved forecasting can also maximize hydropower efficiency."

- "The United States has reduced greenhouse gas emissions by promoting energy efficiency and the broader use of renewable energy through a wide range of public-private partnership programs."

This suggests some room in the plan for renewable energy and related weather and climate forecasting needs.

Chapter four, "Using Energy Wisely", focuses upon energy efficiency and conservation. Efficiency reduces energy shortages, lowers reliance on energy imports, mitigates the impact of high energy prices, and reduces pollution. They key role for government in regards to energy efficiency appears to revolve around setting standards for the market to operate efficiently, including disclosure requirements and consumer information. The NEPD advocates a shift to performance-based evaluation of existing energy efficiency research and development programs. Depending upon the metrics selected for the evaluation, this could lead to an emphasis on technologies that have more immediate benefits or applications.

In the fifth chapter, "Energy for a New Century", the NEPD reviews current and future energy sources, limitation, and expected demands. Two key facets of energy production are technology and development of new resources. The merits of new technology are employed to justify development of ecologically-sensitive areas, in particular the Arctic National Wildlife Refuge (ANWR), believe to contain a major source of oil and natural gas. In addition to new development, improved extraction techniques could add nearly 60 billion barrels of oil from existing wells. Key concerns are the limitations of development on public lands and the federal government's role in expediting the plant siting review process. With regards to particular energy sources, the NEPD concludes:

- Coal: offers stable prices but regulatory uncertainty; a critical component of future supplies; can reduce pollution through a $2 billion ten-year DOE investment in Clean Coal technologies
- Nuclear: should encourage new technology to reduce the waste stream and increase safety; secure a central waste depository site
- Hydropower: limited development potential and susceptible to drought; licensing process needs an overhaul
- Natural Gas: expected to be 90% of new generation capacity in next twenty years; biggest challenge is supply and distribution
- Oil: critical element of transportation sector; expected to decline in non-transportation sector by 80% over next twenty years
- Renewable Energy (wind, geothermal, biomass): major barrier is economic – "non-hydropower renewable energy generation costs are greater than other traditional energy sources."

Chapter six focuses upon "Nature's Power", an examination of renewable energy technologies, alternative fuels, distributed energy systems, and future energy sources. The NEPD notes that although non-hydropower renewable energy only accounts for 2% of the total energy consumed in the U.S., it is among the fastest-growing sectors. Overall, barriers to renewable energy could be removed through improving access to federal lands, continuing research and development through a $39.2 million increase in the DOE Energy Supply account, and forming public-private partnerships to further alternative energy research and development programs. Primary targets

for short-term development include microturbines powered by bio-fuels and wind energy. With regards to the latter, the NEPD notes: "the industry is poised for growth. In some parts of the country, electricity from wind power can be produced at prices that are comparable to other conventional energy technologies."

Two promising areas for environmentally-sound development are in alternative fuels and distributed energy. The NEPD notes that vehicle emissions are the leading source of U.S. air pollution. Hybrid vehicles and fuel cells are two promising emergent technologies that can curtail the use of oil in the transportation sector. New, innovative, incentives must be devised to encourage market penetration, because fleet mandates have proven ineffective. Distributed energy – including natural gas microturbines, solar roof panels, cogeneration facilities (heat and power from biomass), stationary fuel cells, and small wind systems – promote energy efficiency through reduced transmission line losses, on-site efficiency, and effective use of waste heat. Standards on interconnection, air quality issues, zoning regulations, and high up-front costs are some of the issues surrounding distributed energy systems. Lastly, the NEPD looks toward hydrogen and fusion as longer-term environmentally-friendly sources of energy. The NEPD advocates extending existing tax credits on wind and biomass and establishing a $2,000 (limit) tax credit for solar energy property. They also advocate a $1.2 billion dollar research program, with funding coming from ANWR leases (hence bundling environmental interests with oil development interests).

The report turns, in chapter seven, to "America's Energy Infrastructure." The NEPD cites enormous needs in upgrading transmission lines, pipelines, production facilities, and the transportation network. They note that more electricity is being shipped longer distances over a transmission system that was designed for limited reserve sharing among neighbors. While electricity demand is projected to increase 25% by 2020, transmission capacity upgrades will amount to only 4%, increasing congestion, reliability problems, and high regional prices during shortages. Consideration should be given to a national transmission grid to overcome some of the major regional barriers, and the federal government should assist in obtaining rights-of-way for new transmission lines and pipelines. In regards to managing resources and anticipating needs, the NEPD looks toward more accurate weather and climate forecasts. Forecasts can be used for pre-event mitigation measures, management of resources, preventing power outages, accelerating restoration after events occur, and designing and building infrastructure.

The final chapter examines "Strengthening Global Alliances." The NEPD focuses upon market forces as providing security through diversified supply and production efficiencies. A combination of new exploration, new pipelines to get key development areas – such as the Caspian Sea basin – to markets, and removal of market barriers to encourage investment is projected to address global energy security needs. U.S. companies are world leaders in the energy sectors. The U.S. should encourage cooperation through existing international organizations and through the office of the U.S. Trade Representative to remove market barriers so that U.S. companies can safely invest in regions such as Africa and Russia. Lastly, energy-efficient technology should be exported, particular to Asia, to reduce growing demands that place pressure on world oil supplies.

Energy Plan Website: http://www.whitehouse.gov/energy/

OKLAHOMA ENERGY

Electricity deregulation in Oklahoma was postponed during the last legislative session. Senate Bill 440 provided for an Electric Advisory Task Force that will generate a report, sent to the Governor and Legislature no later than November 1, 2002. Retail choice will not be implemented prior to the completion of the report.

The Task Force is composed of nine members: The Chairs of the Senate and House committees with jurisdiction over energy regulation, House and Senate members of the minority party (parties), the Governor, the Attorney General, a Corporation Commissioner, the Superintendent of Public Instruction, and the Vice-Chair of the Oklahoma Tax Commission. The Task Force is charged with reviewing all issues concerning restructuring the electric industry in this state. The Task Force has met several times since its creation in May 2001, with its first focus being upon transmission issues.

Senate Bill 440 also provides for a tax credit for zero-emission facilities. The legislation provides for a tax credit of 0.75-cent per kilowatt-hour for electricity generated prior to January 1, 2004. The tax credit is reduced to 0.50-cent per kilowatt-hour for electricity generated between January 1, 2004 and prior to January 1, 2007. Thereafter, the tax decreases to 0.25-cent per kilowatt-hour until January 1, 2012, at which time it is phased out entirely. The tax credit can be carried forward into subsequent tax years and is transferable to other entities with Oklahoma state tax burdens.

Although the Task Force is not directly dealing with opportunities related to renewable energy development in Oklahoma, such issues will likely be included in their final report. In fact, transmission capacity is a major barrier to development of renewable energy facilities in western Oklahoma; therefore the first issue tackled by the Task Force will provide tremendous benefits for the development of new industries in the state.

More direct consideration of renewable energy is being addressed by an Interim Study on Incentives for Green Energy, requested by Rep. James Covey. The Interim Study committee met in Norman at the OU Student Union on November 8, 2001. Thirteen state Representatives were present at the meeting. The meeting was hosted by the Oklahoma Renewable Energy Council (Tim Hughes, Chair). The committee heard from Henry Durrwachter, TSU Energy Trading, on the Texas Renewable Portfolio Standard; Peter Adels, PennFuture, on the Pennsylvania model for restructuring, and Mike Bergey, Bergey Windpower Co., on economic development potential from small wind systems.

While nothing conclusive has come forward yet in terms of either significant funding for research and education regarding renewable energy or policies to promote renewable energy, it is likely that further incentives may come in the 2003 legislative session. The development of wind and solar energy, especially, rely extensively upon weather and climate information, which could provide tremendous new opportunities for the Oklahoma Weather Center.

Electric Utility Deregulation Status: http://utilityrestructuring.femp.doe.gov/electric/ok.htm
Senate Bill 440: http://www.lsb.state.ok.us/senate/Electric_Restructuring/sb220ccs.html

COMMENTS ON NATIONAL AND OKLAHOMA ENERGY POLICY

As expected, the Bush-Cheney energy plan is focused upon the private sector. Three key areas all point in the same direction:

- Federal government should open up federal lands for access to exploration, development, and transmission;
- Federal research and development programs should undergo performance-based evaluations;
- Federal government should streamline permitting and licensing procedures.

All of these assume a seamless transition from research to the marketplace, a concept that has repeatedly come under attack from both inside and outside the science community. Performance-based evaluations may be appropriate for operational support, such as price subsidies or tax credits, but are very difficult to undertake in experimental research and development. Partly, the "benefit" side of the benefit-cost equation is difficult to ascertain, because any benefits are merely projections, while the costs are concrete. One possible outcome of this new approach is a shift toward sponsoring further research and development of energy sources or programs that are already in the marketplace, in the process undercutting research for "emerging technology" such as alternative energy sources and fuels. The exceptions to this seem to be in hydrogen – which is already receiving substantial private investment from the automotive industry – and fusion, which is a long-term concept. Overall, the plan is really an advocacy statement of further oil and gas development. Attention is paid to energy efficiency and renewable energy, but these are often dismissed as partial solutions. In fact, the word "market" appears 196 times in the document, while the word "renewable" appears 147 times.

In Oklahoma, the Electric Advisory Task Force is poised to advance energy development in Oklahoma. Even if it does nothing more than to solve transmission constraint problems, it will open up vast areas of Western Oklahoma for further energy development – prime areas for renewable energy resources. In addition, should the Interim Study on Incentives for Green Energy go forward, these renewable energy industries could rapidly develop in the state, bringing new demands for detailed weather and climate forecasting and local climate assessment.

Despite the oil-and-gas focus, there are some opportunities for the Weather Center and related entities. Regardless of federal or state policies, demand for weather and climate services provided to the energy sectors is growing. With renewable energy development – especially wind – in Oklahoma, tailored wind forecasts at non-standard heights and including local terrain, have the potential to greatly assist energy production forecasting. If solar energy develops, factors such as cirrus clouds will become more important to forecasts. Even outside of renewable energy development, load forecasting and population-based energy consumption indices are prime candidates for further development.

Natural disaster research is also a critical component of the energy sector. As the Bush-Cheney energy plan points out, the increased complexity of the systems makes them more vulnerable. Better forecasting of hurricane tracks, severe weather, winter storms, and river flooding can all contribute to improving routing of transmission or transportation, stockpiling energy supplies in critical areas prior to the events, and rapid recovery of systems following the events.

WARNING ON OIL PRICE AS RUSSIA-OPEC DISPUTE GROWS

By David Buchan in Vienna and Andrew Jack in Moscow
Published: November 15 2001 20:11 | Last Updated: November 16 2001 06:56
FT.com - Financial Times of London

Kuwait warned oil prices could tumble to as little as $10 a barrel as an acrimonious dispute between the Organisation of Petroleum Exporting Countries and Russia over production cuts on Thursday pushed prices to their lowest levels since mid-1999.

The price of crude fell in New York to $17.90 a barrel after Adel Khalid al-Sabeeh, Kuwait's oil minister, said he would "not be surprised if the oil price dropped to $10."

That would "be a hard hit for all of us, and even harder for those with a higher cost of production," he said. Opec producers in the Middle East can pump oil more cheaply than non-Opec countries, including Russia, which is a particular target for the Opec action.

He was speaking a day after Opec ministers in Vienna said they were ready to take another 1.5m barrels a day of their own oil off the glutted world market but only "subject to a firm commitment" by non-Opec producers to show solidarity by cutting 500,000 b/d of their own output. Kuwait, with Saudi Arabia and Iran, is a prime mover behind Opec's brinkmanship towards non-Opec producers.

But Russia, the main target of Opec's stand, refused to budge on Thursday night. Mikhail Kasyanov, the Russian prime minister, said during a visit to Spain that his country would not agree to any significant extra reduction in oil exports because it would jeopardise its policy of fair oil prices and steady supplies to Europe.

"We are not going to at any time reduce production on a big scale; it's impossible," Mr Kasyanov said.

Ali Naimi, Saudi Arabia's oil minister, claimed Opec was not pursuing a war over price or market share, but rather launching "an appeal to all major oil producers to manage a market at a reasonable level." This was necessary he said, because of the "abnormal conditions" created by the September 11 terrorist attacks' impact on the world economy and oil markets.

Oil analysts said that while Opec might be deliberately engaging in a price war in the terms of undercutting non-Opec producers, or dumping Opec oil on the market, its action amounted to the same tactic.

The cartel evidently calculates, or hopes, lower prices would cause non-Opec producers to crack first, and to agree to the production cuts Opec is demanding of them. Opec ministers said their Vienna declaration made it clear that Opec, which has already reduced its quotas by 3.5m b/d this year, would not go on cutting alone.

Robert Priddle, head of the International Energy Agency in Paris, said on Thursday a "sustained collapse" of oil prices was unlikely because of "lingering risks" to supply. Following September 11, oil price jumped to $31, but prices then fell as the US confined its campaign to Afghanistan.

COMMENTS:

Declining oil prices will reduce state revenues from oil and gas production taxes. Current projections suggest that total state revenues will remain flat, or could actually *decline* next year. This means that new funding for FY2003 will be virtually non-existent, or will have to come from other sources (program cuts). There is even potential for cuts in state agency budgets, which will make for a contentious year at the State Capitol. So it's more than a contest between OPEC and Russia – it affects all oil producing regions, even those that have little significant impact upon global oil supplies.

NATIONAL & LOCAL NEWS

- A CRISIS IN PUBLIC SERVICE
  David S. Broder, Washington Post, October 21, 2001

- TECHNOLOGY MAY INCREASE WORKLOAD, NOT PRODUCTIVITY
  Excerpts from Michele Himmelberg, The Orange County Register
  (appeared in Oklahoman Oct. 21, 2001)

- SENATE APPROVES MILLIONS IN PROJECTS
  From the Sunday Oklahoman, November 4, 2001

NOAA NEWS

http://www.noaanews.noaa.gov/stories/archive.htm

- CONRAD LAUTENBACHER TO TAKE HELM AT NOAA
  December 3, 2001
  (picked up from American Association of State Climatologists listserve)

- WEATHER IMPACT ON USA ECONOMY
  November 1, 2001

- HURRICANE PERFORMANCE AN ACCURATE READ BY NOAA FORECASTERS
  November 7, 2001

- FLOOD OUTLOOK PRODUCT DECLARED OPERATIONAL BY NOAA's NATIONAL WEATHER SERVICE
  November 2, 2001

- NOAA'S NATIONAL WEATHER SERVICE ROLLS OUT NEW WIND CHILL TEMPERATURE INDEX
  November 1, 2001

A CRISIS IN PUBLIC SERVICE

By David S. Broder
Sunday, October 21, 2001; Page B07

Whatever their views before Sept. 11, Americans of all stripes have relearned the lesson that when there is a crisis, it's handy to have a government that can cope. Not just the heroic firefighters, police and rescue workers but bureaucrats in the Pentagon and State Department and scientists at the Centers for Disease Control and Prevention have won acclaim. Trust in government is at a 35-year high.

How long this will last, no one can say. But a variety of people, both in the private sector and in public office, have decided that this is the moment to launch an effort to repair and improve the federal bureaucracy -- an institution they say is in crisis.

Last week President Bush took time from his work as commander in chief to address an awards ceremony for outstanding senior civil servants and to set forth an initiative to make work more rewarding for those already in government and more attractive to the thousands of talented people Uncle Sam will have to recruit in the years just ahead. While reiterating his opposition to expanded government, he described federal employment as "a noble calling and a public trust," and vowed to make federal jobs "more challenging, more satisfying and more fulfilling."

This week (Tuesday) will see the formal roll-out of the Partnership for Public Service, a new nonprofit dedicated to attracting talented people -- both recent graduates and those in midcareer -- to government and improving the bureaucratic environment. The partnership is funded with a $25 million gift from Samuel Heyman, who worked for Attorney General Robert Kennedy 40 years ago and made his fortune as a Connecticut businessman.

Next week, also, two Republican legislators, Sen. George Voinovich of Ohio and Rep. Constance Morella of Maryland, will introduce legislation designed to make it easier to hire and retain high-quality employees and to emulate the modern management techniques that have made America's outstanding private companies good places to work. Their legislation is strikingly similar in purpose and in detail to the "freedom to manage" proposals unveiled by the Bush administration at the ceremony where the president spoke.

This emphasis on the quality of the federal work force is timely, and not just because of the appreciation for public service that so many Americans have developed in the wake of the terrorist attacks. Dramatic action is necessary now to improve the conditions for government workers to prevent a mass exodus that could cripple agencies' ability to function.

As Max Stier, the partnership president (who has worked in all three branches of the federal government), points out, in the next three years more than half of federal workers will be eligible for retirement; more than seven out of 10 top government managers can claim their pensions by 2004.

In some agencies, the demographic gap is even more dramatic. Voinovich told me that the Nuclear Regulatory Commission -- responsible for the safety of atomic energy -- has six times more people over 60 on its payroll than under 30. "That is not unusual," he said, "and it explains why Jim Schlesinger [the former secretary of defense] says we are facing an unprecedented crisis" in staffing government.

There is broad agreement on many of the steps needed to make government work better: Increase the earning potential of specialists and top managers; make it easier for agencies to bring in both young talent and proven midlevel executives; make personnel issues a higher priority within the agencies.

But beyond those rather mechanical changes, much will depend on the kind of message and encouragement career people receive from their political bosses. One Bush Cabinet member who clearly understands this is Treasury Secretary Paul O'Neill.

In a recent appearance before the Council for Excellence in Government, another nonprofit working to improve the quality of the bureaucracy, O'Neill, a onetime White House deputy budget director who went on to run International Paper and Alcoa, talked about the difference between leading an organization and simply managing it.

"Leadership," he said, "is really about creating the conditions where people are comfortable with change and they know that they have an opportunity to make a contribution . . . and they're not in the business of taking orders."

A great organization, in O'Neill's terms, is one where everyone "is treated with dignity and respect . . . is given the tools and assistance needed to make a contribution that gives meaning to life" and receives recognition and thanks for making that contribution.

When all government agencies are like that, the crisis in public service will be over.

COMMENTS:

According to Mr. Broder, leaders including President Bush and Treasury Secretary Paul O'Neill have been focusing upon incentives to attract talented people to federal service. Mr. Broder notes that in the next three years, more than half of federal workers will be eligible for retirement. More than seventy percent of top government managers "can claim their pensions by 2004." He quotes former Secretary of Energy James Schlesinger as saying we are facing "an unprecedented crisis" in staffing government.

According to Mr. Broder, there is "broad agreement" on many of the steps needed to make government work better. These include increasing the earning potential of specialists and top manager, easing the hiring process for young and mid-level executives, increasing the importance paid to personnel issues, and most importantly improving the working conditions so that people can contribute and receive recognition for their contributions.

The significance of this piece for those of us at the University of Oklahoma is that we may play a role in educating and placing many of this next generation of federal employees. New opportunities exist within federal government, not necessarily in the field offices of the National Weather Service, but perhaps in other federal agencies which previously have not been considered fertile ground for placement of recent graduates. Programs such as the AMS' Atmospheric Policy Program recognizes the importance of training graduates in the skills needed to be successful in Washington.

TECHNOLOGY MAY INCREASE WORKLOAD, NOT PRODUCTIVITY
Excerpts from Michele Himmelberg, The Orange County Register (appeared in Oklahoman Oct. 21, 2001)

A study by Rogen International and Goldhaber Research Associates finds executives spend at least two hours a day using e-mail. The survey pulled 1,400 executives and concluded that "E-mail appears to be adding to time spent communicating in business, not saving time." The article further states: "Adding the latest gadget or newest software to your arsenal doesn't make you a better broker, banker, or Web-page designer, but people expect that it will, and that's causing bouts of 'digital depression'." According to Jeff Ring, a consultant for Priority Management in Irvine, California, "Whatever tools you have, if you don't know the process, you will still make mistakes, only you'll do them at lightning speed these days."

Ring offers suggestions for "taming the information tsunami":

- Identify your priorities, and create a daily plan to accomplish them;
- Write a personal mission statement; it helps get you on track if you derail;
- Monitor your actions regularly to make sure they match your goals;
- Develop good habits to manage information.

SENATE APPROVES MILLIONS IN PROJECTS
From the Sunday Oklahoman, November 4, 2001

WASHINGTON – The Senate on Thursday approved millions of dollars for Oklahoma projects, including Norman's new weather center and statues planned in Oklahoma City commemorating the 1889 Land Run.

Rep. Ernest Istook, R-Warr Acres, and Sen. Don Nickles, R-Ponca City, also secured money to beef up anti-drug trafficking efforts in Oklahoma and across the nation.

The money is included in a bill that funds several federal agencies, including the Treasury Department. Istook, the head of the appropriations subcommittee that handled the bill, shepherded it through the House on Wednesday, adding some of the Oklahoma money.

The legislation will go to the president and is expected to be signed.

CONRAD LAUTENBACHER TO TAKE HELM AT NOAA

Retired Navy Admiral Will Become NOAA's New Administrator The U.S. Senate confirmed retired Navy Vice Adm. Conrad C. Lautenbacher Jr., Ph.D., as Under Secretary of Commerce for Oceans and Atmosphere. In this capacity, he will serve as administrator of the Commerce Department's National Oceanic and Atmospheric Administration (NOAA), the nation's top science agency for oceans and the atmosphere.

"The appointment of Conrad Lautenbacher as NOAA's administrator is a clear affirmation of the Bush Administration's commitment to protect our nation's natural resources," said Commerce Secretary Don Evans. "With more than three decades of service to the nation, he brings a strong understanding of our oceans and environment. I am confident the nation and NOAA will be well served by this dedicated public servant."

NOAA serves the nation by forecasting all U.S. weather and climate, operating environmental satellites, monitoring and archiving ocean and atmospheric data, managing marine fisheries and mammals, and conducting cutting-edge oceanic, atmospheric and solar research. It maintains an annual budget of more than $3.2 billion and 12,700 employees at posts in every U.S. state, at sea and many overseas locations. The agency manages the U.S. operational weather and environmental satellites, a fleet of research ships and aircraft, 12 environmental research laboratories and is home to one of the nation's seven uniform services, the NOAA Corps. "NOAA programs and services impact all Americans, and I look forward to leading this fine agency," Lautenbacher said. "We face many critical environmental issues and it is vital that we continue to learn more about the interaction between our oceans and atmosphere."

A native of Philadelphia, Penn., and a graduate of the U.S. Naval Academy, Lautenbacher has served in a broad range of command, operational and staff billets. He served as deputy chief of Naval Operations in charge of resource allocation and requirements development for the Navy, commander of the U.S. Third Fleet and director of the Office of Program Appraisal. As a director on the Joint Staff, he reported to the chairman of the Joint Chiefs of Staff as principal strategic planning and resource allocation executive, making key recommendations affecting the size and composition of the U.S. Armed Forces. His background also includes operational tours in Vietnam and the Persian Gulf, as well as assignments as systems analyst with the Office of the Assistant Secretary of Defense.

Lautenbacher attended Harvard University, receiving master's and doctorate degrees in applied mathematics. He was selected as a Navy Federal Executive Fellow and served at the Brookings Institution. Most recently he was the president of CORE, the Consortium for Oceanographic Research and Education. CORE is a Washington, D.C., based association of 66 U.S. oceanographic research institutions, universities, laboratories and aquaria.

COMMENTS:

Given Dr. Lautenbacher's prior experiences, look for emphasis on strategic planning within NOAA. This is also consistent with OMB's shift toward outcome-based evaluations of R&D programs, which began this year with the Department of Energy. Look for a similar development within NOAA soon.

WEATHER IMPACT ON USA ECONOMY

November 1, 2001 — Each year weather events have major economic impacts on the U.S. economy. Estimates vary, but up to 2.2 trillion dollars of the economy are believed to be affected annually by weather and climate events, according to Dean John Dutton of Pennsylvania State University. These include agriculture, forestry, fishing $125B; energy resource extraction $89B; public utilities $2.7B; finance and insurance $260B; construction $373B; retail trade $782B; hotel and recreation $147B; and transportation $218B.

During the 21st century, unprecedented situations will arise where weather, water and climate events could significantly challenge the way Americans live or cause dramatic changes in the economy.

The U.S. sustained 49 weather-related disasters over the past 21 years each of which sustained overall damages and costs of $1 billion or more, with total damages and costs exceeding $185 billion. Seven occurred during 1998 alone—the most for any year on record. Tropical Storm Allison in June 2001 was a $5 billion disaster.

Not only does weather have direct and indirect economic impacts, but information about the weather has become an integral part of the nation's economic infrastructure.

The innovative use of weather, water and climate information will increase our safety and productivity and improve the nation's competitiveness to enhance our standard of living.

A recent study found that the long-range predictions issued by NOAA's Climate Prediction Center for the 1997-98 El Niño led California to conduct major mitigation efforts leading to a reduction in losses of about $1 billion.

Perhaps the best recent example of a business opportunity created by increased availability of weather and climate information is weather risk management which has mushroomed into an $8 billion economic sector.

Relevant Web Sites
NOAA's Office of Climate, Water, and Weather Services
http://www.nws.noaa.gov/om/

Media Contact:
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HURRICANE PERFORMANCE AN ACCURATE READ BY NOAA FORECASTERS

November 7, 2001 — With Hurricane Michelle heading out to sea after battering Cuba and the Bahama Islands, meteorologists at NOAA's National Hurricane Center are noting the storm as one of the most accurately forecast tropical events in the Miami center's history.

"Even though Hurricane Michelle was erratic at times, the storm performed almost exactly as our forecasters and one computer model consistently predicted, " said Max Mayfield, director of NOAA's National Hurricane Center. "Accurately predicting its movement and intensity was a great asset to emergency mangers, business and industry, and others preparing for this storm."

From its formation in the Caribbean Sea on October 29, the late-season storm had monstrous potential. Drawing strength from the warm tropical waters, Michelle topped out at Category 4 on the 1 to 5 Saffir-Simpson hurricane intensity scale with sustained winds of 135 mph. It made a direct hit on Cuba six days later, becoming the island's worst hurricane since 1952.

With the Florida Keys evacuating in the face of hurricane-force winds, heavy surf, and four-foot storm surge, the rest of Florida drew a sigh of relief as hurricane center forecasters took the storm northeast through the Bahamas and out to sea.

"As with many hurricanes, a slight change in direction would have brought Michelle right into the mainland U.S. and even the Gulf of Mexico," Mayfield explained. "By accurately forecasting the storm to move just to our south, we spared many communities the great expense and hardship of large-scale evacuation".

The hurricane expert added, "Without the sophisticated hurricane tracking capabilities of the 21st century, Michelle's close passage to southern Florida would have spurred massive—but unnecessary—evacuations."

The November hurricane brought a flurry of activity to the National Hurricane Center as emergency managers, media, and other storm trackers converged on the NOAA facility. Satellite images, complex computer models, and data collected from hurricane hunting aircraft were but a few tools of the trade employed by the center's highly specialized meteorologists. Television cameras provided a steady stream of expert interviews to an anxious world while timely forecast data buzzed across the Internet and other high-tech communication hubs.

One of NOAA's disaster response partners, the Federal Emergency Management Agency, set up shop at the hurricane center, as did Billy Wagner, a fixture in the Florida Keys emergency management community. "We had assistance across the boards," Mayfield notes. "This hurricane was a team effort from every perspective and echelon".

Hurricane Michelle also marked the success of another Atlantic Hurricane Season Outlook, produced by NOAA's Climate Prediction Center and partners at NOAA's Hurricane Research Division and National Hurricane Center. "This marks the fourth consecutive success since its inception," said James Laver, acting director of the Climate Prediction Center.

In August, after only two tropical storms at the start of the peak period, NOAA's hurricane forecasters increased this year's prediction from "normal" to "normal-to-slightly-above-normal" activity for the rest of the 2001 Atlantic hurricane season.

"Beginning with tropical storm Allison, this year's Atlantic hurricane season has been anything but quiet," said lead climate specialist Dr. Gerald Bell. He added, "including Hurricane Noel, the 2001 Atlantic hurricane season tallied 14 named storms, eight hurricanes, and four major hurricanes and the season is not over yet."

The Atlantic hurricane season ends on November 30.

FLOOD OUTLOOK PRODUCT DECLARED OPERATIONAL BY NOAA's NATIONAL WEATHER SERVICE

November 2, 2001 — NOAA's National Weather Service began issuing five-day flood outlooks that identify areas at risk of significant river flooding Nov. 1. This product was tested by NOAA's River Forecast Centers for the past two months and proved useful to emergency managers.

"Over the past 50 years, flooding cost an average of 100 lives and almost $4 billion in damages per year in the United States—more than any other severe weather-related event," said John Jones, deputy director of NOAA's National Weather Service. "Flooding can result from any one, or a combination of too much rain, rapid snow melt, or flood waters flowing downstream. The flood outlook product is an assessment of the likelihood of these factors, based on precipitation forecasts, snow cover and forecast temperature patterns."

The flood outlook is developed by each of the 13 regional River Forecast Centers throughout the United States, and is available to the public with a graphical display on the Internet. An additional map, produced by NOAA's Hydrometeorological Prediction Center in collaboration with the RFCs, shows flood potential for the contiguous 48 states and is available through the Emergency Managers Weather Information Network, NOAA Port, the Family of Services, the Hydrometeorological Prediction Center and NOAA web page. The national product is published daily at 4:00 p.m. ET.

A prototype for this product was developed by the Southeast River Forecast Center to help warn communities of major flooding that resulted from Hurricane Floyd two years ago.

"We want to give our users enough warning to help save lives and minimize property damage," said John Feldt, chief hydrologist for the center. "This new graphical product will give us a unique opportunity to provide a longer term outlook that will enable the public to prepare for potential flooding."

The weather service began the first operational testing stage of this product for the coastal states from Texas to New Jersey in September 2001. In October 2001, the second test phase was conducted, with all 13 River Forecast Centers providing five-day flood outlooks for their areas of responsibility on their respective Web sites.

The 13 different River Forecast Centers throughout the United States enable the weather service to focus on locally unique hydrologic conditions, including the potential impact of future precipitation on river levels. During the winter, the effects of river ice, ice jams and snowmelt will be considered as well.

NOAA's National Weather Service is the primary source of weather and flood forecasts and warnings for the United States and its territories. NWS operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy.

Relevant Web Sites
NOAA's Significant River Flood Outlook
http://www.hpc.ncep.noaa.gov/nationalfloodoutlook/

Additional Information about NOAA's New Flood Outlook Product
http://www.nws.noaa.gov/oh/hic/Flood_Outlook/index.html

NOAA'S NATIONAL WEATHER SERVICE ROLLS OUT NEW WIND CHILL TEMPERATURE INDEX

November 1, 2001 — NOAA's National Weather Service today implemented a new method to compute wind chill temperature to provide better winter weather warnings throughout the nation. For the first time, the index will include specific wind chill threshold values showing frostbite danger at given periods of time.

"We're proud that the new index reflects the best science, technology and computer modeling technology," said retired General Jack Kelly, director of NOAA's National Weather Service. “For the first time, a consistent standard of wind chill will be used by both Canada and the United States."

The new wind chill formula is the product of a year-long effort by scientists and wind chill experts from the academic community, and the U.S. and Canadian governments. The Office of the Federal Coordinator for Meteorological Services and Supporting Research created this Joint Action Group for Temperature Indices, which is chaired by the NWS. The goal of JAG/TI is to internationally upgrade and standardize the index for temperature extremes (e.g. Wind Chill Index).

In October 2000, scientists began evaluating the previous wind chill formula and developed plans for a standardized index among the meteorological community for North America. This new wind chill formula was developed after extensive analysis of the factors that impact wind chill, using the latest advances in science, technology and computer modeling to provide a more accurate, understandable and useful model for calculating the dangers from winter winds and freezing temperatures. The resulting formula was then tested using human volunteers at the wind tunnel and climatic chamber of the Defense and Civil Institute of Environmental Medicine in Toronto, Canada.

Specifically, the new wind chill index will:

- Use calculated wind speed at an average height of five feet (typical height of an adult human face) based on readings from the national standard height of 33 feet (typical height of an anemometer);
- Be based on a human face model;
- Incorporate modern heat transfer theory (heat loss from the body to its surroundings, during cold and breezy/windy days);
- Lower the calm wind threshold to 3 mph;
- Use a consistent standard for skin tissue resistance; and
- Assume no impact from the sun (i.e. clear night sky).

The new formula has been incorporated into the latest software installed on the NWS Advanced Weather Interactive Prediction System (AWIPS) effective Nov. 1, 2001. In 2002, adjustments for solar radiation (the impact of the sun) and for a variety of sky conditions (sunny, partly sunny and cloudy) may be added to the calculation model.

"The new wind chill index provides us with specific warning of time-to-frostbite at given levels of wind chill," Kelly said. "Since it is the responsibility of the National Weather Service to help protect lives, we believe this will be an important service to the American people during winters to come."

The previous index has been used by the National Weather Service since 1973, and was based on science produced by Antarctic explorers in 1945.

The new wind chill index is available online.

Relevant Web Sites
NOAA's New Wind Chill Chart
http://www.nws.noaa.gov/om/windchill/

NOAA's Meteorological Calculator
http://www.srh.noaa.gov/FTPROOT/FFC/html/metcalc.shtml