

The Subcommittee on Oversight, Investigations, and Emergency Management

Hearing on

Cost Effectiveness of Hazard Mitigation Spending

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PURPOSE

The purpose of this hearing is to receive testimony on the cost-effectiveness of disaster mitigation spending authorized by the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program. In particular, this hearing will follow up from a hearing held by the Subcommittee on August 4, 1999 and will focus on the extent to which projects that are not exempted from a cost-benefit analysis by the Federal Emergency Management Agency are cost-effective.

BACKGROUND

The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) establishes the basis for Federal assistance to State and local governments impacted by a significant disaster or emergency. The Federal Emergency Management Agency (FEMA) is primarily responsible for administering such assistance. The Stafford Act not only provides funding for post-disaster recovery, but it also provides funding for cost-effective hazard mitigation projects. Hazard mitigation includes any action taken to reduce or eliminate the risk to people and property from hazards and their effects before the disaster occurs. Examples of mitigation activities include, but are not limited to, seismic strengthening of critical buildings and infrastructure, relocation of buildings from flood areas, installing shutters on windows in hurricane areas, and building "tornado safe rooms" in houses.

Specifically, section 404 of the Stafford Act – also known as Hazard Mitigation Grant Program (HMGP) – authorizes the President to contribute "up to 75 percent of the cost of hazard mitigation measures which the President has determined are cost-effective and which substantially reduce the risk of future damage, hardship, loss, or suffering in any area affected by a major disaster." The total amount of Federal spending under the HMGP is limited to 15 percent of the aggregate amount of federal assistance grants made under the Stafford Act with respect to a specific disaster in a specific area. Thus, after a disaster is declared and an area receives federal recovery assistance, the disaster area is also eligible to receive an additional 15 percent in federal funding to be used for hazard mitigation projects. FEMA has

subsequently interpreted this section to allow the funding of mitigation projects in any part of the state in which the disaster occurred. State or local governments must pay for up to 25 percent of the cost of any mitigation project funded under the HMGP.

The Stafford Act requires that HMGP funded projects be cost-effective. Consistent with Office of Management and Budget guidelines, FEMA has adopted the use of benefit-cost analysis as the preferred method for determining cost-effectiveness. According to FEMA's regulations, a mitigation project is cost-effective if the total cost of the project is less than the expected benefits of avoiding damage from future disasters. Thus, the project must be expected to save at least \$1 of every \$1 spent or have a benefit-cost ratio (BCR) of no less than 1.0.

On August 4, 1999, the Subcommittee held a hearing on the cost-effectiveness of certain hazard mitigation grants funded under the HMGP. At this hearing, the Subcommittee learned that FEMA had administratively exempted several categories of projects from being subject to a traditional benefit-cost analysis. Since June 1993, FEMA has authorized over 3000 projects to be funded under the HMGP. Approximately 715 projects, representing approximately \$275 million, were exempt from the benefit-cost requirement.

As a follow-up to the hearing in August, FEMA created a database containing information, including BCRs, on all HMGP projects it has funded since 1993. These data were provided to the Subcommittee and the General Accounting Office. These data show that since 1993, 2556 projects, which were not exempted from benefit-cost analysis requirement, have been approved by FEMA. Of these projects over 15 percent (391) have a benefit cost ratio of 1.0 or less. The total amount of Federal dollars spent on projects with a BCR less than 1.0 is over \$300 million. This is nearly 20 percent of all Federal dollars spent on non-exempt HMGP projects.

In addition, the data show that a significant number of projects being funded under the HMGP are marginally cost-effective. Of the non-exempt projects, 39 percent (1,006) have a BCR between 1.01 and 1.5. These projects accounted for \$756 million in spending. Thus, over \$1 billion, 68 percent, of the money spent by FEMA under the HMGP has gone towards projects, which, according to the BCR are not, or are only marginally, cost-effective.

ISSUES

Section 404 of the Stafford Act requires mitigation projects funded by FEMA be cost-effective. The recently available data indicates that a significant fraction of mitigation projects are not cost-effective according to traditional benefit-cost analysis. In addition, many of the projects have BCRs that are not much greater than 1.0 indicating that they may only be marginally cost-effective. The focus of this hearing will be to examine whether the data accurately reflects the cost-effectiveness of the funded projects and, if so, why projects that are not cost-effective or that are only marginally cost-effective make up such a large portion of funded projects.

Issues likely to be examined include: the accuracy of the HMGP database; the method used for conducting benefit-cost analyses; the adequacy of traditional benefit-cost analyses; the administrative process for approving grants including the process for appealing funding decisions; and recent trends in the cost-effectiveness of funded projects.

EXHIBITS

[Charts Pertaining to the Cost Effectiveness of Hazard Mitigation Spending](#)

WITNESSES

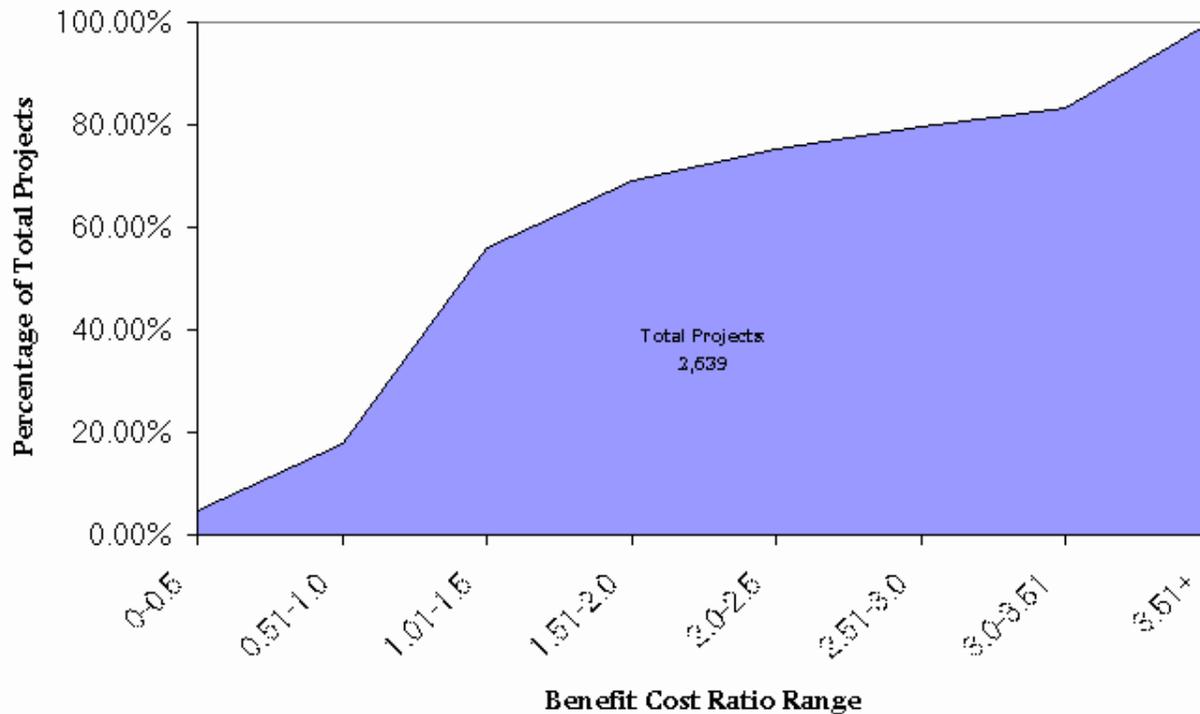
PANEL I

[Mr. Michael Armstrong](#)

Associate Director, Mitigation Directorate
Federal Emergency Management Agency

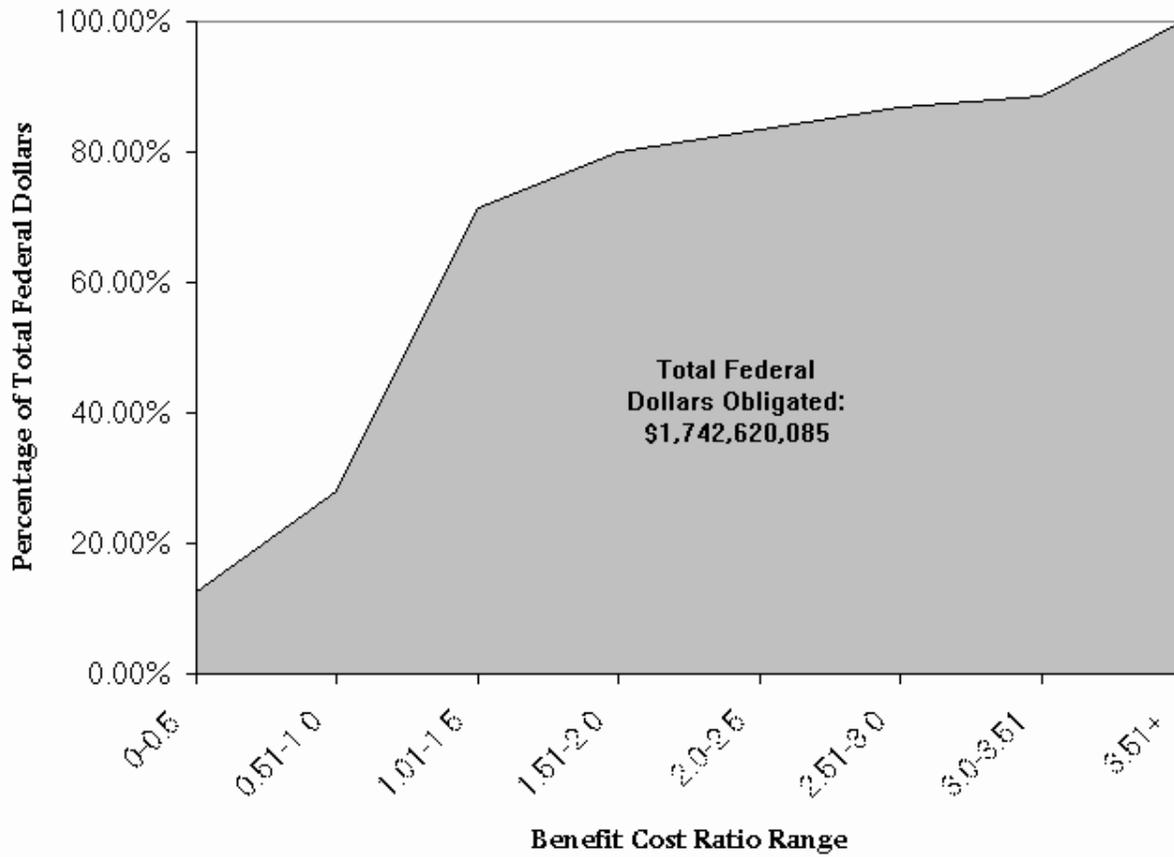
PERCENTAGE OF TOTAL HAZARD MITIGATION GRANT PROJECTS BY BENEFIT COST RATIO FOR FISCAL YEARS 1990 - 2000*

Source: Transportation and Infrastructure Committee based on data from FEMA's Mitigation Directorate



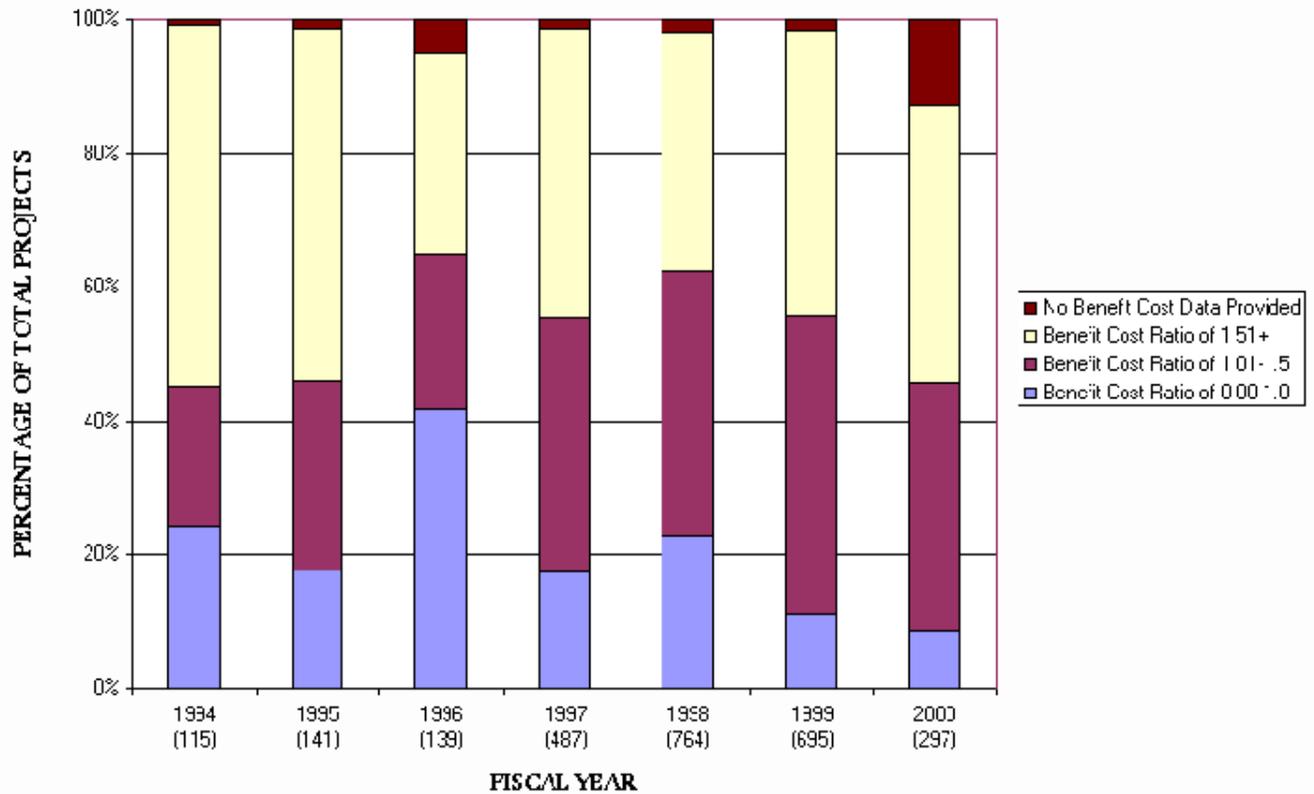
PERCENTAGE OF TOTAL FEDERAL SPENDING ON HAZARD MITIGATION GRANT PROJECTS BY BENEFIT COST RATIO FOR FISCAL YEARS 1990 - 2000

Source: Transportation and Infrastructure Committee based on data received from FEMA's Mitigation Directorate

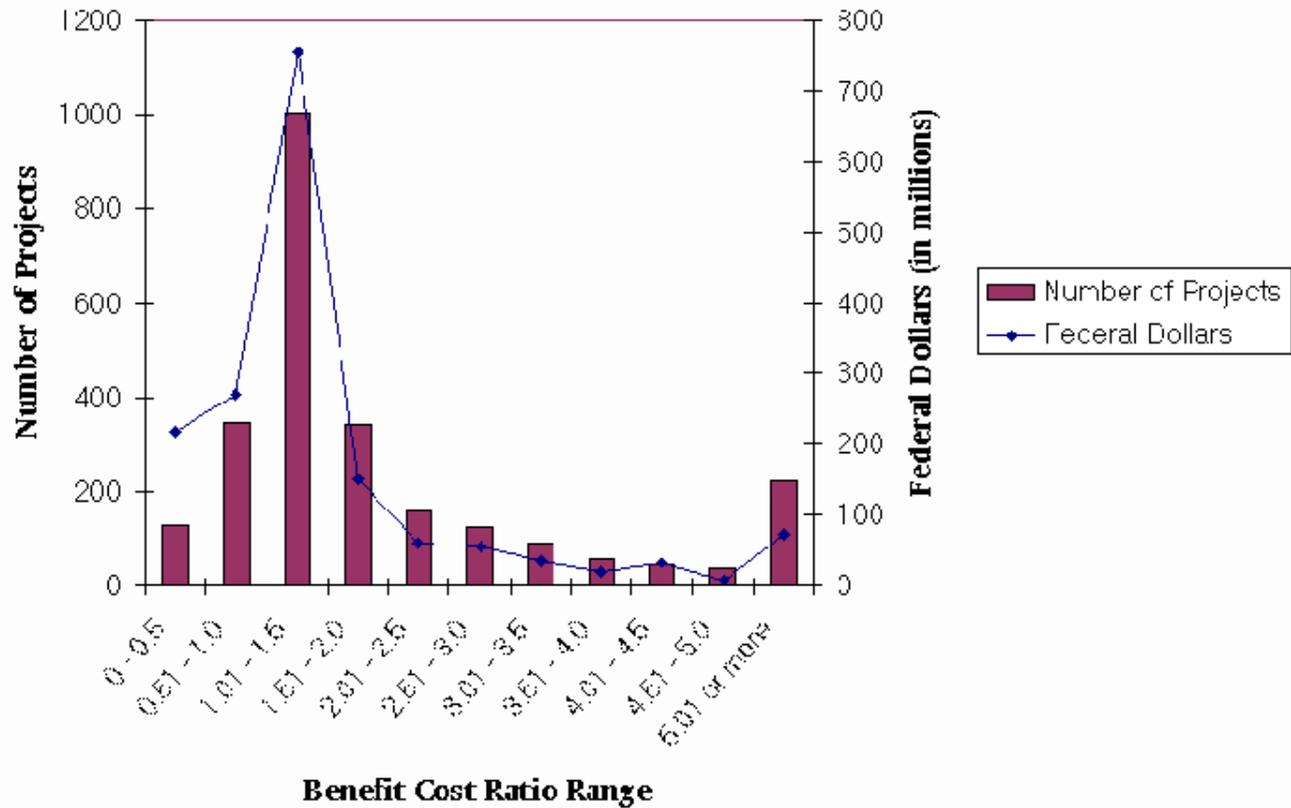


HAZARD MITIGATION GRANT PROJECTS WITH LOW OR MARGINAL BENEFIT COST RATIOS AS PERCENTAGE OF TOTAL PROJECTS FOR FISCAL YEARS 1994-2000

Source: Transportation and Infrastructure Committee based on data from FEMA's Mitigation Directorate



BENEFIT COST RATIO DISTRIBUTION OF HAZARD MITIGATION GRANT PROJECTS FOR FISCAL YEARS 1990 - 2000 Source: Transportation and Infrastructure Committee based on data from FEMA's Mitigation Directorate



Testimony of

Michael Armstrong

Associate Director for Mitigation

Federal Emergency Management Agency

Before the Subcommittee on

Oversight, Investigations, and

Emergency Management

Committee on Transportation

and Infrastructure

United States House of Representatives

Washington, D.C.

July 20, 2000

Good Afternoon Chairwoman Fowler, and members of the Subcommittee.

My name is Michael Armstrong and I am the Associate Director for Mitigation at the Federal Emergency Management Agency (FEMA). I'm very pleased to be appearing before you to discuss FEMA's emphasis on cost-effective spending for projects funded under FEMA's Hazard Mitigation Grant Program (HMGP),

authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

I was here with you just about a year ago to discuss a General Accounting Office (GAO) Report entitled Opportunities to Improve Cost-Effectiveness Determinations under the Hazard Mitigation Grant Program. That report focused on the Hazard Mitigation Grant Program cost-effectiveness review processes and on certain categories of projects that are exempted from a formal cost-benefit analysis (projects involving the purchase of substantially damaged structures, project funded under the "5 percent" initiative, tornado related projects, and hazard mitigation planning projects for older disasters).

Allow me to briefly describe the Hazard Mitigation Grant Program and the process that is followed from project application to grant approval. Following a Presidential declaration of a disaster, an amount equal to 15% of the funds spent by FEMA on relief and recovery efforts is provided by the Federal government for the state to use for hazard mitigation purposes. With a cost-share requirement for HMGP projects, these Federal funds may cover up to 75% of the cost of the hazard mitigation project. The remaining 25% of the project must be contributed from a non-Federal source.

It is important to note that the state plays the primary role in deciding how HMGP funds are applied. The state sets the priorities and selects which projects are submitted to FEMA for review. Historically, states would formulate a Mitigation Strategy, usually within two weeks of the disaster, which would become the set of guiding principles for the mitigation effort resulting from that disaster. I am gratified to report, however, that, today, more and more states have realized that the Hazard Mitigation Grant Program is a cornerstone of post-disaster recovery. Today, the program serves not only as a method to positively prevent future disaster losses but also as the way in which states and local governments address long-term recovery and recoup their economic vitality.

In many cases, the Program also assists individuals and families. Property acquisitions, also known as "Buy-Outs", not only clear the flood plain and restore open space to its natural function of absorbing and storing floodwaters, but acquisitions also uniquely allow the most deeply impacted families an economically viable opportunity to leave a dangerous environment, to leave their flood-ravaged property behind, and to move to a safer future, free of the threat of flooding.

To return to the HMGP grant process, states set priorities and solicit project applications from local governments. Many states then use State Hazard Mitigation Councils to review applications, a process we encourage. Finally, the project applications come to FEMA for review and approval. As a practical matter, our FEMA Regional Offices work side by side with our state and local counterparts to ensure that a complete and well-presented application is submitted, thereby reducing the time needed in the final review stage. FEMA is required by law to review each project for eligibility, cost-effectiveness, and for compliance with the National Environmental Policy Act (NEPA), and other environmental laws, and provide a final determination. We take these responsibilities very seriously.

Eligibility determinations and NEPA determinations require states and particularly local governments to examine alternative actions. Our cost-benefit models, designed to aid us in cost-effectiveness determinations, are based on the notion that more than one valid approach can be undertaken to mitigate a hazardous environment. Our cost-benefit analysis serves us best when we can compute a numerical ratio for each alternative, thereby allowing the reviewer to select an option knowing the relative benefits of each. In the intensity of a post-disaster environment, however, this is not always easy for FEMA to accomplish and even more difficult for states and local governments, who are on the front line. Frankly, when we discover that states and local governments are not sufficiently examining alternatives, we use aggressive technical assistance to help them broaden their analysis—but, in the end, the states decide which projects they submit for review.

Having agreed with the recommendations of the GAO, that FEMA establish the basis for exempting substantially damaged properties from a formal cost-benefit analysis and that we study the cost-effectiveness of other exempt projects after they have been implemented, in November of last year, we issued an Action Plan that specified our plans to address these suggestions. This Action Plan indicates that we will complete these studies and report back to the Subcommittee by the fall of this year. We remain committed to this timeframe and will provide the results to the Subcommittee and the GAO.

I would, however, like to reiterate the findings of a report commissioned by FEMA entitled Economic Evaluation of Substantially Damaged Structures Funded through the Hazard Mitigation Grant Program. I touched on these findings last year, when the report was still in draft; it was issued as final in September 1999. This report

calculated retrospectively the benefits and costs of approximately ten percent of acquisition and relocation projects for substantially damaged structures in the floodplain, approximately 2,000 structures. These properties are a sampling of those that are currently exempted from cost benefit analysis. In aggregate, these projects were found to have a benefit-cost ratio of 2.21; projects completed in our Region X in the Pacific Northwest had an even higher benefit-cost ratio of 6.10. We are in the process of further evaluating the cost-effectiveness of acquisition and relocation projects for substantially damaged properties to help us determine whether to continue to waive the formal cost-benefit analysis for this category of HMGP projects.

While it is important to consider the benefits of buy-out projects in aggregate, we also must consider each project on a case by case basis. There are sometimes instances in which some of the properties included in a buy-out project do not meet a rigid standard of cost-effectiveness, as determined by a benefit-cost ratio of greater than 1.0. For example, there will be instances where certain homes not meeting this standard must be included in the project; otherwise, the infrastructure serving all the affected homes cannot be removed and the environmental benefits of clearing the land are compromised. In order to obtain these critical benefits, it may be necessary to approve mitigation measures for homes that do not individually meet a strict standard of cost-effectiveness if the aggregate neighborhood project does meet an appropriate measure of cost-effectiveness. Still, our goal is to ensure that all buy-out projects meet the cost-effectiveness standard, even if some individual properties do not.

Last year, both FEMA and the Subcommittee were confronted by a lack of data on which we could characterize and analyze the Hazard Mitigation Grant Program. Data for the Program is contained in our historical data base, starting in June 1993, when the Volkmer Amendment changed the required cost-share from the HMGP from a more burdensome 50/50 to a 75/25 Federal/non-Federal cost-share, to November 1998, when the National Emergency Management Information System (NEMIS) came on-line. Data from November 1998 to the present is contained in NEMIS. I am happy to report that, with a very intensive effort to verify historical data and with continued improvements to NEMIS, we are now able to produce analyses with greater confidence. We are also able to create visual displays of program activity. For example, we are now able to geographically represent the locations of the property acquisition, elevation, and relocation projects approved before March 3, 2000, as shown on the map before you.

We have been working with Committee staff and keeping them informed of our progress on an on-going basis. Let me say, Chairwoman Fowler, that our working relationship with your staff, in particular, Mr. Marcus Peacock and Mr. Dan Shulman, has been extremely collegial and very productive.

It is important to note, however, that the databases are not yet 100% complete for all projects and we are really just beginning to conduct these more accurate evaluations. We are also just bringing to conclusion the studies recommended by the GAO. Early indications are that we may discover some practices that may need to be amended, but there is heartening information as well. For example, using data on projects approved or closed between June 1993 and May 2000 that were reviewed with a cost-benefit analysis, we have learned that:

- The aggregate cost-benefit ratio for 658 private real estate property acquisition projects is 2.09 (based on completed data for 90% of the projects in this category); and
- Projects that retrofitted public and private structures to protect against wind resulted in a cost-benefit ratio of 2.82 (based on completed data for 96% of the projects in this category).

Given that our standard of cost-effectiveness is a greater than 1.0 ratio, this is good news, indeed.

Last year Mr. Stan Czerwinski of the GAO described the Hazard Mitigation Grant Program as the flagship of FEMA's mitigation efforts. While we are justifiably proud of our accomplishments in meeting our statutory charter of reducing "the risk of future damage, hardship, loss, or suffering", we believe that the HMGP is the forerunner of a comprehensive family of mitigation approaches promoted by FEMA. Most prominently, the HMGP has laid the foundation for an aggressive, far-reaching, pre-disaster mitigation initiative, Project Impact: Building Disaster Resistant Communities. With its emphasis on locally based initiatives, communities across the country are pursuing common-sense damage-reduction objectives based on risk assessment, private sector participation, and an investment in preventative measures and long-term results. Project Impact has been extremely successful in addressing many of the challenges that we see in implementing the Hazard Mitigation Grant Program, particularly a lack of planning at the local level of government. Project Impact communities value pre-disaster planning not only for providing critical direction in recovering from a disaster, but to reduce or eliminate

the impact of a disaster. Pre-disaster planning motivates communities to look at alternatives and to undertake measures that enhance the environment and improve their livability, thereby providing a safer, more sustainable, future for their citizens.

The law requires FEMA to fund only projects and activities that are cost-effective. To comply with this stipulation, we generally use cost-benefit models created by national experts. To produce the benefit side of this analysis, these models capture most of the easily calculable direct benefits. Unfortunately, as I have said previously before this Subcommittee, there are many more benefits not presently captured by our cost-benefit models, benefits that are difficult to quantify.

If I may, I'd like to illustrate this inherent shortcoming with an example of a typical buy-out of a floodprone home. In this situation, our cost-benefit models capture the benefits that removing the home will provide in avoided future damage to the structure itself and in saving the temporary housing costs were the home to be flooded again. However, our models do not capture other substantial benefits such as:

- Future reduced emergency management costs;
- Future savings derived from being able to remove flood threatened infrastructure, such as water, sewer, electrical, and telephone systems as well as roads and bridges, that were required to service the removed residences;
- Future debris removal costs;
- Future losses in tax revenue from economic disruption;
- Future environmental benefits resulting from removing homes, businesses and infrastructure from the floodplain and restoring open space; and
- The intangible, yet precious benefits of safety, security, and peace of mind.

The list goes on and on, but the point here is to demonstrate that FEMA's current cost-benefit models represent only some of the benefits. Many other benefits accrue for mitigation projects such as buyouts. Were these benefits factored into the calculation, the resulting cost-benefit ratios would likely be significantly higher.

As of May 31, 2000, FEMA has obligated over \$2.4 billion for the Federal share of HMGP projects. These projects have addressed hazards ranging from earthquakes, to floods, to droughts, to snow and ice, to tornados, to fishing losses and mud/landslides and have included acquisitions/relocations, warning systems, vegetation management, shoreline stabilization, seismic retrofits, water and sanitary

sewer system protective measures, and wetland restoration/creation. So much has been accomplished under this Program over the past seven years. As a result of this Program, lives have been saved, property has been protected, and damages have been reduced. The HMGP is an effective approach to prevention and risk reduction.

And the future is brighter still. In our leadership role in developing a national mitigation strategy, FEMA is developing Hazards U.S.' or HAZUS, a multi-hazard loss estimation model. This important tool will be available for Federal, state and local government to assess risks (an overlay of hazards and the potentially impacted area, including the built environment) and to devise strategies to alleviate and to avoid those risks. The regional and local analyses from HAZUS will allow the states to set priorities based on the greatest risk and the highest potential losses. Knowing the probable impacts in advance, state and local governments will be able to work with FEMA to craft comprehensive mitigation plans to address the specifics of their area, based on geography and existing and planned development. These plans, in turn, will provide pre-established state priorities for Hazard Mitigation Grant Program project applications.

There is no doubt that better planning leads to better, more cost-effective hazard mitigation projects. Congress has recognized the importance of planning by including a provision in the proposed Disaster Mitigation Act to increase the amount of Federal funding provided under the HMGP from 15% to 20% of Federal disaster expenditures when the state has an approved disaster mitigation plan in place at the time of the disaster.

We also continue to work to improve and modernize our cost-benefit software. Following the iterative process of software development, we are already hard at work in developing the next generation of cost-benefit software. We will also continue to conduct studies into the benefits of hazard mitigation and to include the results of these studies into future versions of our software and project approval policies and procedures.

That is the future. Now back to the present. I would like to thank the Committee for its continued interest and support. I appreciate the time and attention and would welcome the opportunity to respond to any questions you may have.