

EERE-PMC News

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Clouds and storms regularly sweep the skies above the Bering Sea and Little Diomed Island where the Weatherization Assistance Program led to major home energy efficiency improvements for local residents.

PMC News this month features the [Weatherization Assistance Program](#) (WAP) and if you read nothing else, read John Horst's story on the rehabilitation of houses on Little Diomed Island in the Bering Sea off of Alaska and one mile from Russia. It exemplifies WAP's value as a catalyst in improving peoples' lives through improved home energy efficiency and safety. Plus, it's a darn good read about people banding together to help one another. ([read story](#))

Our News section continues to be thin. Please let us know if you have events, issues or interesting on-the-ground stories that revolve around EERE programs. E-mail or call us with any information you might like to share with your peers. Our pledge in return is to listen and to work to make this a product you'll want to continue receiving.

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Register for national ethanol conference

Anyone interested in securing a spot at the 12th annual National Ethanol Conference February 19-21 in Tucson, Ariz. may now [register on line](#).

The premier event titled, "Building New Horizons," will take place at the JW Marriott and encourage industry leaders to discuss ethanol's overall impact and help shape the future of the U.S. ethanol industry. A hot topic will be improving production efficiencies and reducing energy usage.

A record 2,000 attendees are expected, including fuel suppliers, distributors, local station owners and representatives of public and private fleets. Presenters include the National Corn Growers Association, American Petroleum Institute, National Biodiesel Board, General Motors and the U.S. Department of Agriculture.

The conference is sponsored by the Renewable Fuels Association, whose roles include developing policies, marketing strategies and techniques in the U.S. ethanol industry.

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Solar America Partnership deadline extended

The deadline for Solar City Strategic Partnership applications has been extended to February 21.

Under the Solar America Initiative (SAI), DOE will provide funding and technical assistance to up to 10 cities to develop a fully-scoped, city-wide solar implementation plan.

Cities will be asked to integrate solar technology into their energy planning and facilities. They will also be expected to streamline city regulations and practices that might currently act as barriers to solar power development.

Participants are also asked to promote solar technologies among residents and local businesses.

[Download Funding Opportunity Announcement and application instructions](#)

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State of the Union strong on clean energy

President Bush showed strong support of clean energy in his 2007 State of the Union address, saying, "It is in our vital interest to diversify America's energy supply — and the way forward is through technology. We must continue changing the way America generates electric power — by even greater use of clean coal technology ... solar and wind energy ... and clean, safe nuclear power. We need to press on with battery research for plug-in and hybrid vehicles, and expand the use of clean diesel vehicles and biodiesel fuel. We must continue investing in new methods of producing ethanol — using everything from wood chips, to grasses, to agricultural wastes."

[Full speech text](#)

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EERE/PMC retirements

This month and February will see the retirement of four EERE leaders who have worked for many years with EERE stakeholders and states.

- Jim Powell: Program Manager, Weatherization and Intergovernmental; former Southeast Regional Office Director;
- John Kersten: Manager, Golden Field Office;
- Jerry Zimmer: Golden Procurement Program Manager;
- Bill Becker: former Central Regional Office Director.

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Weatherization Assistance Program

What Weatherization Assistance Does

Training Resources

WAP's series of Weatherization Standards and Field Guides have become the standard on how to improve

residential energy efficiency.

“These guides represent a systematic procedure for how to treat a home based on needs of a particular state such as climate, best practices and building codes,” said WAP Project Manager Michael Peterson.

“They serve as an educational tool to help weatherization experts adhere to consistent methods and updated procedures.”

The guides cover areas of Health and Safety, Diagnostic Testing, Mechanical Systems, Appliances and Lighting, Air Sealing & Insulation and Mobile Home Standards.

For a good example, take a look at [Minnesota's Weatherization Field Guide](#)

Each year DOE's [Weatherization Assistance Program](#) (WAP) makes 100,000 homes more comfortable, healthy and affordable by providing energy efficiency services to low income families. Recipient families experience an average home energy savings of \$358 per year following weatherization. American taxpayers also receive good returns, with each DOE dollar invested in the program returning \$1.54 in energy savings.

This comes at a time when household energy use comprises 22 percent of total U.S. energy consumption.

Since WAP started in 1976, it has become one of DOE's most effective market transformation tools, moving new residential energy efficiency technologies into the marketplace. As Carrie Smith, director of the local weatherization agency FSL Home Improvements in Phoenix, Ariz., recently stated, “We've come a long way since we first started nailing weather-stripping around leaky doors and stapling sheets of plastic over drafty windows.” Today, WAP leads the nation in developing and using new diagnostic tools for determining the suitability and cost effectiveness of a specific energy efficiency technology in any given situation.

WAP also has become DOE's major player in moving energy efficiency technologies into America's homes – safe, effective insulation; high efficiency furnaces; low energy use refrigerators; programmable thermostats; compact fluorescent lighting — the list goes on as new technologies become available and cost effective. In Wisconsin, for instance, WAP led the state in moving toward replacement of older, inefficient furnaces with new high efficiency models. This exposed home builders and home owners to the benefits of these new furnaces, including fuel savings. They began to install them in their own applications. This is how real market transformation works.

Rob DeSoto, a WAP project manager in Golden, Colo., has worked at the federal, state and local levels of weatherization assistance since the early days of the program. He explained how the program works. “When a homeowner (or renter) is approved for weatherization assistance, the first thing that happens is a technician goes to the home to conduct an energy audit. He or she uses a blower door to depressurize the house to determine how tight it is and to check for air leaks.



Technician demonstrates infrared camera for detecting residential heat leaks.

"Technicians also use diagnostic tools such as infrared cameras to detect heat losses, leaky ducts, poor insulation; things of that sort.

"It's the responsibility of each WAP agency to determine the most effective ways to improve each home's energy efficiency; every one is different based on individual characteristics of the home as well as the climate in which it's located. And they not only have to improve the home's energy efficiency, but do it in the most cost effective manner possible."

Cal Steiner, weatherization coordinator and trainer with the North Dakota Department of Commerce, has thirty years of experience in the weatherization field as a crew member, foreman, estimator, coordinator, researcher and trainer. "Dollars for weatherization are limited," he said. "This program is driven by knowledge and metrics; they're what keep us in business. We're not just passing federal dollars through the system, and we're not just slapping up weather-stripping. Every dollar spent to install weatherization measures is required to return more than a dollar's worth of energy cost savings – or we don't do it.

"We also pay close attention to energy-related health and safety issues. As part of the home energy audit, we test heating systems and appliances for combustion safety. We test for carbon monoxide and gas leaks. We look for possible moisture damage or mold infestations. We check the electrical panels and wiring for safety. We replace unsafe heating and cooling systems, and install smoke and carbon monoxide detectors.

"Once the audit is complete, crews move in to apply and install the energy efficiency improvements with the best paybacks. Typically, they may install insulation in walls and attics, seal ducts, tune and repair heating and cooling systems, or install new ones if necessary. They take cost effective steps to mitigate air infiltration and reduce electric base load consumption. You can't do everything to every home. You have to choose those items that return the most energy savings, health and comfort for the dollars spent."

That attention to detail pays off. A study in the winter of 2000 demonstrated that our nation's residential energy bill was \$1 billion less than it would have been without WAP's cumulative effort over the years. This was money that stayed in local economies, money that families could use for other choices and improvements in their lives. Another measure of WAP's success is it decreases our national energy consumption by the equivalent of almost 18 million barrels of oil annually.

DOE's residential energy efficiency research and close technical monitoring of WAP form the core activities that regional, state, and local participants leverage into success. WAP's effectiveness is built upon a dedicated cadre of more than 920 community action agencies, local governments, non-profit agencies, and independent contractors across the country who actually go into peoples' homes to do the work. These local weatherization service providers are well supported by their state weatherization programs, which coordinate and oversee their activities. DOE provides resources and trained staff for on-going training, technical assistance and compliance monitoring. It also plays a key role in developing and disseminating information about improved methods and new technologies for the entire network.

DOE's Weatherization Assistance Program Manager Jean Diggs says, "I'm proud of this program. I'm proud of our people in the field who administer it and work with the states. I'm proud of all the state and local people who actually get the job done. Every time I get out with these folks and experience their enthusiasm for their jobs and what they are accomplishing, I come back to D.C. with renewed dedication to this program. It demonstrates real dollar returns for our economy, and more than that, it makes a genuine and positive difference in peoples' lives.

"Since the program's inception in 1976, more than 5.7 million households have been weatherized, in all 50 states, the District of Columbia and among Native American tribes. That sounds like a lot, until you realize that over 34 million households are currently eligible for our weatherization services. We've got a lot of work to do, and we have the people who can continue to do it."

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Photo © Bill Hess, courtesy of Running Dog Publications
Helicopter pilot approaches Little Diomedede Island village to check for a landing spot.

Wap leads housing rehab team to Bering Sea island

Little Diomedede Island is incredibly rugged. It sits along a rocky, steep slope where snow trails carve along the hillside up to houses perched on stilts. Conditions can be deadly, sometimes reaching 45 below zero with the wind constantly pounding houses.

When the [RurAL Community Action Program](#) (RurAL CAP) in Anchorage, Alaska took the lead in finding a way to rehabilitate and weatherize 30 homes for this community of about 150 people in 2002, it knew the project was seemingly impossible due to inadequate funding and the logistical headaches that go with reaching the island.

The Little Diomedede community is located about 125 miles off the coast of Nome, Alaska in the Bering Strait. The village's closest neighbor is Big Diomedede, located in Russia about a mile across the channel and the International Date Line.



Primitive housing, pummeled by harsh weather, was the norm before the housing rehab project on Little Diomedede Island.

"Nothing could have prepared me for this scenario," said Mitzi Barker, director of RurAL CAP's Housing and Planning Division. Before moving to Alaska, she worked in rural communities in Alabama and Mississippi. "The houses at Diomedede were in a dilapidated state and very poorly insulated. Many were built of plywood and because of residential density and high humidity, many of the units were plagued by extensive interior mold.

"Outside, steps were incredibly steep and rickety. I have a huge respect for people who live there, especially the elders who navigate these steps and the foot trails that connect the homes in the snow."



Housing reconstruction wasn't easy so far north and west; Russia can be seen in background.

DOE's Weatherization Assistance Program paved the way for RurAL CAP to seriously pursue the project and to involve multiple partners, including the U.S. Dept. of Housing and Urban Development, the Alaska Housing Finance Corporation, Bering Straits Regional Housing Authority, the native village of Diomedes and Kawerak, Inc., a regional human and community services agency.

"DOE funding served as the anchor to put together a more comprehensive rehab project based on the additional funding," Barker said. "The scope of the project went way beyond what weatherization funding provided, but without it, none of this would have been possible."

The scope of the project was three years – one year to raise funds and plan logistics to bring building materials to the remote island and two years to complete construction.

Sending supplies to Little Diomedes was a major hurdle since no runway or harbor exists. The village receives air service by helicopter once a week, as weather permits, bringing passengers, mail, groceries and other goods. And although a voyage by boat from the Alaskan mainland is possible when the waterways are clear, it's still treacherous.

"Traditional council leaders were faced with a difficult decision — either stay and continue to brave the elements or uproot and move to the mainland. We had to do something."

For supplies to arrive to the island before waterways froze, RurAL CAP had to ensure they were on a barge sent out of Seattle, Wash. more than 21 days in advance. It's not uncommon for summer storms to keep boats in harbor for over a week. In Nome, the materials had to be offloaded from the barge and broken down into smaller packets for transit to Diomedes by a much smaller craft, then lightered ashore by skiff.

"First we had to get supplies to Nome and then we transshipped everything, and even called on the help of small fishing boats to get materials to Diomedes," Barker said.

Another obstacle was to upgrade and in some cases reconstruct the housing without disturbing the surroundings, since the entire island is a bird sanctuary and archeological site. Any environmental impact is prohibited as the area is filled with walrus, whales, polar bears, seals, crabs, fish and several species of birds, all of which are important subsistence resources to the native people.

"Little Diomedes are proud people with a rich culture," Barker said. "They are world-renowned for their native arts and crafts. They are a subsistence culture and a very functional community."

"One of their goals is to do more eco-tourism to bring people to the island to help bring in necessary cash to buy fuel and pay for electricity. But their eco-tourism ambitions were seriously hampered by rapidly deteriorating housing conditions that threatened the community's continued existence on the island."

RurAL CAP also assisted in hiring and training local help. About 20 people in the community were trained in

weatherization and housing rehabilitation skills and worked to rebuild the homes under the supervision of RurAL CAP personnel.

Types of housing improvements included heavily insulated walls, floors and ceilings, efficient lighting fixtures, high efficiency stoves, electric and static ventilation systems, and on the outside, slip resistant stairways, arctic entries with double doors and new siding.



The final outcome: safe, energy efficient homes with a new level of comfort and safety for the residents.

It took three construction phases to complete the project, starting in spring of 2003; the first construction phase was cut short due to bad weather that knocked out communication lines for three months. Builders were able to complete only 13 houses.

Workers returned to the island the next two spring seasons to complete the project, weatherizing a total of 30 homes.

"Originally we had budgeted for a winter airlift of supplies to be delivered by landing on frozen sea ice. Fortunately we had more favorable weather than planned, and we could use a landing-craft barge service. This reduced costs and allowed us to service six additional homes.

"Everybody thought this project was worth doing and committed to making it happen. We're proud to have played a part in improving the living conditions and preserving the rich culture of this village."

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Training centers broaden weatherization skills

WAP supports state-level training centers intended for technicians, contractors, inspectors and home builders so they may develop necessary technical skills for improving home energy conservation.

Nine weatherization training centers in the U.S. are centrally located to approximately 1,000 local weatherization agencies. The centers, sponsored by DOE and the National Association for State and Community Service Programs, are in California, Colorado, Kansas, Ohio, Indiana, Pennsylvania, West Virginia, Virginia and New York. [Directory of Training Centers](#)

Among them are the [Weatherization Assistance Training Center](#) at the Pennsylvania College of Technology (WTC) in Williamsport, Pa. and the [Indiana Community Action Association](#) (INCAA) Training Center in Indianapolis.

These training facilities ensure that weatherization specialists understand concepts such as building science, reducing energy consumption and how to conduct diagnostic testing procedures to improve health, safety and comfort for occupants.

"We're the go-to resource for the state," said Bill Van der Meer, director of the training center. "We set up conferences, do consulting and provide participants with hands-on weatherization courses. We also provide weatherization field guides, national energy audits and priority lists of energy analysis measures."

WTC, established in 1985, trains about 325 people a year. Class sizes range from 10-12 students to allow students to work more closely with instructors and to demonstrate they know the technologies.



Weatherization instructor points out proper duct insulating procedures.

The center is equipped with a 6,000-square-foot lab with construction mockups and demonstrations. It operates an oil and gas furnace workshop, a carpentry workshop and keeps a mobile unit on site for infield training at agency locations.

Training is arranged in a competency-based format, meaning a participant must demonstrate specific types of written and hands-on skills through testing protocols before applying for more advanced courses. The training is comprehensive and intense.

Courses include Weatherization Tactics, Diagnostic Approaches to Weatherization, Advanced Diagnostics Combustion Analysis (*NEW!*) and Retrofit of Gas-fired Heating Systems and Home Energy Auditing.

"Students come to us with a variety of skills," Van der Meer said. "All have a certain interest because they are employed by agencies and need to get up to speed on weatherization."

At the conclusion of a course, workshop or exam, the WTC forwards relevant student competencies, grades and certificates to the sub-grantee or organization that requested the training.

INCAA, for its part, has also been around since the early 1980's and employs four full-time instructors who provide weatherization training.



A WTC instructor measures backdrafting, pressure imbalances, comfort zones and more in a pressurized model home that yields real life results.

The center consults industry leaders in areas of residential energy efficiency, HVAC system design and operation, carbon monoxide detection and mitigation and computer software.

"The goal is to provide essential, weatherization training throughout the state," INCAA Training Manager Tom Andrews said.

At INCAA, 36 weatherization courses are offered during the year – mostly on a by-demand basis; they focus on building applications, health and safety components and building envelope techniques. A key theme throughout: saving energy.

"All of the classes are hands-on about energy use and following health and safety issues," Andrews said. "We work with trade groups to utilities to home inspectors to contractors. What we're doing is fairly cutting-edge in the building industry and we're finding most of the people who attend these trainings become keenly aware of its impact on the industry."

INCAA also prepares participants to obtain certifications required by the state.

"That's a major component," Andrews said. "The certification in the last five years has made the quality of weatherization work that much better and faster. About 1,600 homes in the state are weatherized a year."

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WAP improves safety and comfort for Native Americans

Allan Slater is an energy auditor. He inspects homes on the reservation of the [Passamaquoddy Tribe](#) at Pleasant Point and Peter Dana Point in Maine to determine how to save energy. He also routinely performs diagnostic tests for carbon monoxide levels, air leaks, poor insulation, torn-up shingles and other health and safety issues.

Recently he inspected the home of an elderly woman on the Passamaquoddy reservation – located right off the Atlantic Ocean at the eastern-most point of the state – after learning of frozen pipes in the middle of her house.

"A number of homes on the reservations aren't structurally sound or built to conserve energy," said Tony Gill, a program officer for the Maine Housing Authority, who oversees housing for five tribes in the state. "We can do some minor things that have a major impact."

For this particular issue, Slater used a variety of technical WAP tools and procedures to find an air leak caused by a vertical shaft leading from the attic to the basement. When air from the ocean pressurized the attic, it leaked to the basement and blew open a cellar door.

"We used a blower door test and an infrared camera to find the air leak," Slater said. "The camera revealed where the air was coming from, and when we saw it, we sealed it and heavily insulated the area. The main issue with many of these homes is poor energy efficiency, so we try to make the houses warmer."

This fits WAP's goal of helping to increase the energy efficiency of a dwelling to reduce an occupant's energy costs during peak heating and cooling seasons. It is estimated that low-income families spend an average of 16 percent of their annual income on energy costs, while other households spend about 5 percent.



The lands of the Navajo nation are swept by harsh environmental conditions that make efficient shelter essential.

"The No. 1 priority for this program is to increase energy efficiency of dwellings owned or occupied by low-income persons, reduce their total residential expenditures, and improve their health and safety," WAP Program Manager Carole Gates said.

Within the [Navajo Nation](#), 27,000 square miles spanning New Mexico and Arizona, the tribe annually weatherizes 150 homes per year – equivalent to helping between 400-600 people. Grants are administered by the Navajo Housing Services Department, which provides funding to five agencies and 110 chapters throughout the Navajo Nation.

The funding process involves ranking applications based on priority service (elderly, disabled, etc.) then sending personnel to perform energy audits and cost estimates on each selected home. Also, WAP funds are often combined with other home rehabilitation funds such as the Bureau of Indian Affairs Home Improvement Program to provide a much better fix than would otherwise be the case.

“For example,” said Elfina Wauneka, acting WAP manager at the Navajo Housing Services Department, “This year we plan to complete about 39 housing improvement projects needing roofing repairs. The DOE weatherization money will allow us to contribute money to replace windows, doors, or insulate walls and attics; other funds can be used for such things as roof repairs.”

Since 1998, WAP has improved approximately 1,500 homes on the reservation and significantly reduced energy costs for tribal members.

“A lot of people on the reservation burn wood as their primary heating source,” Wauneka said. “They are slowly moving toward using more electricity. The Weatherization Assistance Program is seen as a productive and important improvement. People are thankful for the program because it really helps bring down the cost of utility bills and the cost to use wood.”

Slater, in comparison, said approximately 95 percent of the Passamaquoddy heat their homes using oil because electricity rates average 18 cents per kilowatt hour. Heating a home in this area with electricity costs too much; it's not practical.

“It's cheaper for them to use oil,” he said. “While it may not make sense to use electricity, whatever we can do to help them bring down utility costs is tremendously important.”

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WAP leads Wisconsin to new ventilation standard

Over-tightened homes posed a risk for health and safety of occupants; WAP energy efficiency audits were turning up too many associated problems. [Wisconsin's Home Energy Plus Weatherization](#) program managers knew it was time for a change.



A blower door is used to test home for ventilation and air leaks.

Based on blower door tests, Wisconsin moved in 2004 to link building tightness to ventilation, and in 2005 opted to move from a building tightness standard to a ventilation standard.

The state adopted the ASHRAE 62.2 standard for ventilation rates in combination with diagnostic testing to ensure combustion appliance safety and building integrity. The 62.2 standard allows for an infiltration credit (blower door reading) and the intermittent operation setting for the ventilation fan.

In a follow-up study, homes that received ventilation were then tested for humidity and carbon dioxide levels. The occupants' ability to effectively operate their ventilation system was also considered. Wisconsin's mixed climate creates indoor air quality and humidity level issues. Housing stock is generally tighter than buildings in moderate climates.

Based on this most recent study, the state's ventilation protocols have been streamlined to install ventilation in fewer homes. The new protocols allow for customer control options in homes receiving ventilation. The state also developed some simple information for customers that explains how to operate their system and the most practical system settings.

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