Photos courtesy of Gerald Meehl

Two eight-inch guns and an anti-boat gun are some of the remnants of World War II on Betio Island in the Gilbert Islands, 2,500 miles southwest of Hawaii. Japanese occupation of this British territory began in 1942.

World War II inspires climatologist

By Nicole Branan

Bright sunlight bursting out of an azure sky bounces off white sand beaches surrounding the lush tropical vegetation of Tutuila, one of American Samoa's islands in the South Pacific Ocean. It's 1975, and Gerald "Jerry" Meehl (AtmoSci'74, MS'78, PhD'89) is spending much of his time outside, launching weather balloons destined to circle the equator at high altitude and transmit weather information to the nearest satellite, which will then beam it back to the National Center for Atmospheric Research in Boulder.

It seems as if nothing could disturb the peace in this tropical paradise, but rusting fighter planes scattered across the jungles and old armored vehicles wasting away in the shallow turquoise shore speak of a troubled past — a war that turned the tropical Pacific into a bloody battlefield.

"It was an exotic place, and all those World War II relics made the scene bizarre," Meehl remembers today. The expedition to study tropical winds and their influence on regional climate was the first job for the then 24-year-old. It marked the beginning of a long journey that would lead him to become a global climate change pioneer and an author of books about World War II in the Pacific.

Recording history

Meehl, a senior scientist at NCAR in Boulder, grew up hearing a lot of stories about World War II from his three uncles, who fought in the Pacific. Seeing the American aircraft and tanks hidden in jungles where they crashed or rusting on treacherous reefs brought all those stories to life, he recalls.

During his year in the Pacific, he visited scores of far-flung battle sites scattered between Hawaii and New Zealand. He returned to Colorado with hundreds of photographs of World War II remains and started to match them with photos he found at the National Archives in Washington, D.C. As his collection of then-and-now photos grew he began to interview veterans about their time in the Pacific.

"Talking to these veterans and having them tell you stories they seldom, if ever, have told their families was like time travel. It was an experience I found most compelling," he says.

His unique collection of photographs and firsthand war stories have been turned into two books so far, *Pacific Legacy* and *Pacific War Stories* (both Abbeville Press), which he co-authored.

It's all about the weather

Meehl's trips to the Pacific and his childhood as the son of a wheat farming family on the Colorado plains near Hudson planted the seeds for another passion — climate and weather. "I used to listen to my family's incessant talk about the weather," he says. "I remember standing outside in the field in the summertime with my father cheering on the storms we thought would bring rain and trying to ward off the ones that seemed to have hail. As a farmer you are totally at the mercy of the weather in every season."

In the late '70s he became one of only a handful of scientists worldwide to study human impacts on global climate change. "At the time climate change was getting no attention. Nobody talked about global warming. In fact, the climate was cooling, but scientists knew that CO_2 was increasing and they were pretty sure it was due to the burning of fossil fuels. Simple climate models that had been run in the '60s and '70s predicted that at some point things were going to start warming up."

Getting a global grasp

The reason no warming was observed back then, even though greenhouse gas-emitting activities were already in full swing, was because of atmospheric pollutants, most notably sulfurous droplets

spewed out by volcanoes and industrial smokestacks, Meehl explains. This haze acted like a sunshade, reflecting the incoming light and cooling the Earth's surface, thereby masking any warming effects from greenhouse gases such as carbon dioxide.

After industrial countries realized those sulfur compounds caused acid rain that damaged forest ecosystems, they started to remove smog and pollutants from power plant smokestacks, significantly reducing this form of air pollution. Greenhouse gas emissions, however, continued to go up and started to drive the climate, he says.

Meehl, whose wife Marla Sparn Meehl (InfoSci'85, MTele'89) is head of the computer networking section at NCAR, uses a combination of models and observations to make climate projections. His computer simulations take the interactions of the atmosphere, oceans, land surface and ice into account to predict future climate.

In a study published in the journal *Science* last year, Meehl and his colleagues showed that, even if greenhouse gas concentrations in the atmosphere were stabilized now, we would still be committed to a warmer Earth and higher sea levels in the future. This is mainly due to thermal inertia — the idea that global climate changes are delayed because water takes longer to heat up and cool off than air does.

"This means that at any point in time we are committed to a certain amount of climate change in the future. I believe this is something the policy community didn't have a good grasp on," Meehl says. "They were thinking, 'If this global warming thing gets bad enough we'll put some policies into effect and that will put a stop to it — problem solved.' But it's not quite that simple because we will continue to change the climate even if we put policies into effect to stabilize greenhouse gas concentrations."

Three decades of expertise

Over the past 30 years, Meehl has become an authority in this field. He plays a key role on the Intergovernmental Panel on Climate Change, a group of scientists who advise the United Nations on global warming. He has received numerous awards, including the American Meteorological Society Editor's Award in 1999.

Currently Meehl is simulating different scenarios to figure out how different factors, such as projected energy consumptions, population growth and gross product growth, will influence the climate over the next century. Based on those calculations he makes predictions about what it would take to stabilize the climate at certain levels for these different scenarios.

He and his colleagues also are developing more complex climate models that include interactive processes, such as carbon cycles and vegetation movement.

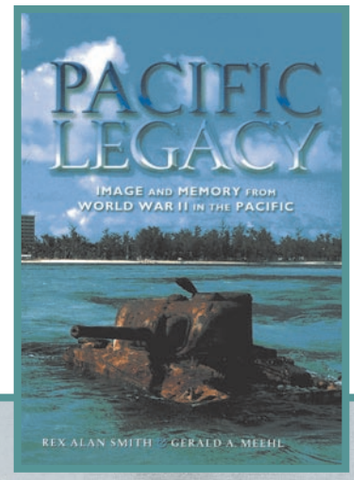
"We are tracking the CO_2 in the atmosphere and include in our models the fact that the oceans, the land and the vegetation are absorbing and releasing the gas in various ways," he says. "Climate change is a very interesting problem from a scientific standpoint."

"It's unfortunate that it has turned into such an incredibly divisive political issue. Many people in the policy world urge scientists to get involved in the policy side of the issue and to push for action. But I believe scientists lose their credibility if they cross the line between science and advocating policy. My job is to do the best possible science. Then I present it to the policy-makers and let them decide what to do."

Over the past three decades the Pacific war has continued to play an important part in Meehl's life. Currently, he is writing a biography of a veteran who worked as a Japanese language interpreter and who trained at the Navy's Japanese Language School at CU in 1942.

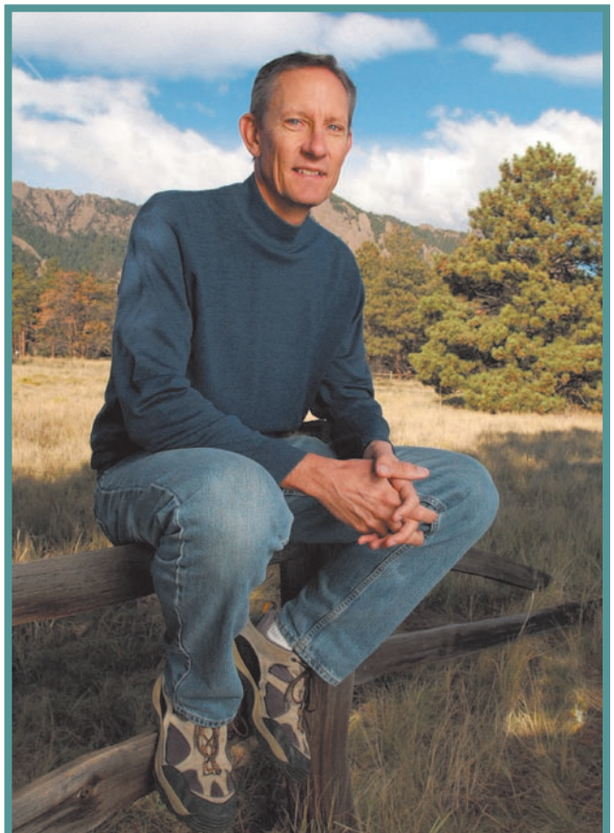
"Writing about the Pacific war is an interesting hobby and a great diversion from scientific research," Meehl says.

Nicole Branan is a freelancer who enjoys watching the tumultuous mountain weather from her porch in Colorado Springs.



Jerry Meehl's *Pacific Legacy*, co-authored by Rex Smith, covers the Pacific theater of World War II from Pearl Harbor to Japan's surrender. The book contrasts color photos of war relics that survive the decades with black-and-white photos taken during the war. Amazingly, the flight crew on the B-24 below walked away from this crash.

National Archives, Gerald Meehl Collection



Larry Harwood

One of the first scientists to study human impacts on global climate change, Jerry Meehl (AtmoSci'74, MS'78, PhD'89), shown here outside Boulder's NCAR, also is an expert on World War II in the Pacific and has co-authored two books on the subject.