

An extensive Public Health Evaluation was completed under the guidance of the Navy and Marine Corps Public Health Center. The Public Health Evaluation was designed to evaluate the potential short and long-term health risks associated with living in the Naples area as a result of inadequate trash collection, uncontrolled open burning of uncollected trash, and widespread dumping of waste, including chemical and other hazardous waste. Launched in 2008 and completed in 2011, the Public Health Evaluation involved the collection of air, water, soil and soil gas samples from throughout the Naples area to identify whether there were potential health risks.

Your Health: Facts for Navy Families in Naples

About: Air Quality Sampling & Meteorological Monitoring

The U.S. Navy is committed to ensuring our families are safe while serving our country at home or overseas. The following information is provided as part of a wide-ranging effort to understand the health risks of our personnel and families living in Naples, Italy. From 2008-2011, the Navy conducted a Public Health Evaluation to assess potential short and long-term health risks associated with living in the Naples area (see sidebar). In line with our commitment to continually share important health information, we encourage you to review the following information.

As part of the Naples Public Health Evaluation, the Navy conducted a one-year ambient air quality and meteorological monitoring study, from July 2008 to July 2009. A map of the air sampling stations and meteorological monitoring locations is provided on page 2 of this fact sheet.

The air study measured concentrations of more than 200 chemicals in ambient (outdoor) air. In addition to air quality sampling, the Navy collected meteorological (weather) data and also obtained weather data from Italian meteorological stations.

The Navy compared ambient air data to U.S. Environmental Protection Agency (USEPA) National Ambient Air Quality Standards (NAAQS) and Regional Screening Levels (RSLs). The NAAQS and RSLs were developed by USEPA to protect public health, including the health of sensitive populations such as asthmatics, children and the elderly.



Air sampling station set up at NSA Naples during the air sampling period. This is one of nine stations constructed by the Navy for the Naples Public Health Evaluation.

What did the Navy learn during the ambient air study?

The Navy compared the air data to six major U.S. cities. These cities included San Diego, California; Los Angeles, California; Seattle, Washington; Houston, Texas; Midlothian, Texas; and Washington, D.C. While most of the contaminants detected in Naples air were similar to those found in the U.S., they were not identical. Therefore, direct comparison of the risk between typical urban air quality in the U.S. and the air quality in Naples is not appropriate. The majority of health risks in Naples were from the chemicals 1,2-dibromo-3-chloropropane (a pesticide) and acrolein (see page 3). Many of the air contaminants that were detected were likely associated with diesel or gasoline exhaust, industrial emissions or agricultural burning.

PM₁₀ (particulate matter of 10 microns in diameter or smaller) was the only criteria pollutant to exceed USEPA NAAQS, which are limits for acceptable levels of pollutants in the air. However, these exceedances were infrequent (only 13 of 436 samples [3%] exceeded the standard). Concentrations frequently exceeded USEPA RSLs, which are a more conservative set of guidelines used when there is known or suspected contamination.

Further, the Navy learned that the health risks did not vary significantly between the nine study areas. Also, the risks associated with ambient air were not significantly higher on days when trash was burned than on days when trash was not burned. Aldehydes (e.g., formaldehyde) were the

only chemicals where the average risks were slightly higher on days when trash was burned than on days when trash was not burned.

The Navy conducted two asthma studies (2008 and 2010) to examine the effect of air quality on health. Results of the ambient air study were applied to the 2010 asthma epidemiological study and found that increased air pollution levels did not affect the number of asthma-related medical visits. However, as the levels of the air pollutant PM₁₀ increased, people that had an asthma-related medical visit were more likely to be diagnosed with worse asthma symptoms.

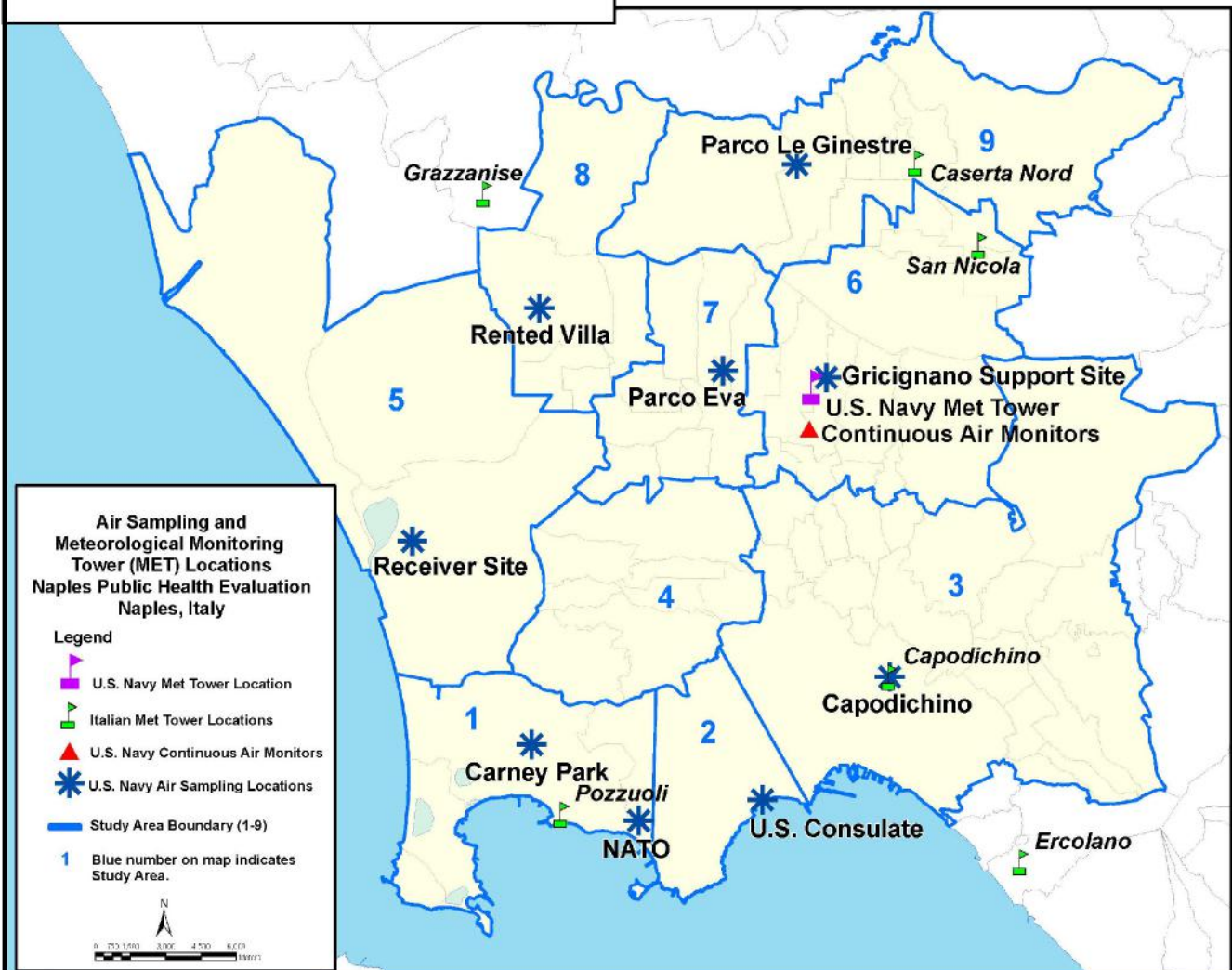
What did the Navy do as a result of the findings?

The Navy informed the Navy community and U.S. Naval Hospital medical providers about the results of the asthma studies and provided recommendations that people could follow. Also, as a result of the 2010 asthma study, the Navy and Marine Corps Public Health Center has recommended that U.S. Naval Hospital Naples consider the impact of the air quality on those with documented respiratory problems, especially persistent asthma, before granting an overseas screening waiver.

What can residents do?

To minimize potential health risks from ambient air, residents should avoid lengthy periods outdoors when open burning is taking place and keep windows closed when outdoor air conditions are poor. If you suffer from asthma or other upper respiratory illnesses, consult your medical provider about actions you can take to help control your symptoms.

AIR SAMPLING STATIONS AND METEOROLOGICAL TOWER LOCATIONS FOR THE PUBLIC HEALTH EVALUATION



Where can residents learn more about the air data?

Detailed information on the year-long ambient air study, including air quality and meteorological data, can be found in the Naples Public Health Evaluation Phase II report. The report is available on the Naples Community Health Awareness website listed at the bottom of this page. If you have questions about the air study, contact the U.S. Naval Hospital Naples, Italy, Public Health DSN: 629-4170 Commercial: 081-811-4170.

How did the Navy collect air data?

Air quality sampling

The Navy collected “24-hour” samples (samples collected over numerous 24-hour periods on different days of the week) from July 9, 2008, to July 8, 2009, at the nine regional ambient air sampling stations. These samples were analyzed for more than 200 specific chemicals, which fall into the following categories:

- Volatile organic compounds
- Semi-volatile organic compounds
- Dioxins and furans
- Metals
- Pesticides and polychlorinated biphenyls
- Particulate matter of 10 microns in diameter or smaller (PM₁₀)
- Aldehydes

The Navy continuously processed and evaluated the approximately 92,000 individual chemical analyses obtained from all of the air samples collected throughout the one-year study period.

In addition to collecting samples at each of the nine air sampling stations, the Navy also performed “continuous air quality monitoring” discussed in the following section.

Continuous air quality monitoring

The “continuous air monitoring” (CAM) sampling program for the Public Health Evaluation continuously measured air concentrations of six chemicals 24-hours per day, seven days per week, for the entire one-year period. These chemicals are commonly found in smog all over the United States and are typically monitored using a CAM program. CAM was conducted to determine if measured ambient air quality chemical

What is 1,2-dibromo-3-chloropropane?

1,2-dibromo-3-chloropropane is a manufactured chemical and is not found naturally in the environment. Some industries use it to make another chemical that is used to make materials that resist burning. It was also used in the past on certain farms to kill pests that harmed crops.

What is acrolein?

Small amounts of acrolein can be formed and can enter the air when trees, tobacco, other plants, gasoline, and oil are burned. Acrolein is also used as a pesticide to control algae, weeds, bacteria and mollusks. It is also used to make other chemicals.

concentrations were in compliance with USEPA NAAQS. During the CAM program, there were no exceedances of NAAQS for all monitored chemicals. The program was conducted from the Support Site in Gricignano.

The chemicals measured included:

- Sulfur dioxide
- Nitrogen monoxide
- Nitrogen dioxide
- Nitrogen oxides
- Carbon monoxide
- Ozone



CAM system at the Support Site in Gricignano.

Over the entire 12 months of the CAM program, none of the chemicals exceeded USEPA standards for 1-hour, 8-hour, or 24-hour periods.

Meteorological monitoring

Meteorological monitoring is the collection of weather information over a certain period of time. This information was used by scientists to determine the local weather conditions during the year-long study and to determine if weather conditions were similar to typical weather conditions for the area being sampled. This is important because chemical concentrations in



For more information, contact:

U.S. Naval Hospital Naples, Italy, Public Health
 DSN: 629-4170
 Comm:39-081-811-4170

Navy and Marine Corps Public Health Center 620 John Paul Jones Circle, Suite 1100
 Portsmouth, VA 23708
 757-953-0664

Naval Support Activity, Naples Public Affairs Office
 PSC 817 Box 40
 FPO AE 09622
 DSN: 626-5912
 Comm:39-081-568-5912

ambient air measured at an air sampling or monitoring station can be impacted by meteorological conditions such as wind speed, wind direction and rainfall, which can vary on a seasonal basis. The scientists can also use the meteorological data to determine if there are relationships between wind direction and measured high chemical concentrations in air, to help identify potential sources of specific chemicals. The Navy erected and operated a 10-meter (33-foot) meteorological tower at the Support Site in Gricignano to collect data required for the ambient air quality evaluation. During the one-year ambient air study, collection of meteorological data included prevailing wind speed/direction, temperature, barometric pressure and rainfall. Meteorological monitoring results for each of these data elements are summarized below.

Wind Speed/Wind Direction

The average hourly wind speed in miles per hour (mph) at the Support Site in Gricignano was greatest in the winter (6.26 mph) and lowest in the fall (4.59 mph). The maximum reported 1-hour average wind speed was 24.0 mph, which occurred in the spring. The annual average 1-hour wind speed was 5.30 mph. In general, wind directions varied from the east and west over the annual period with the prevailing wind direction at the Support Site being from the east. The prevailing seasonal wind directions were from the east-northeast in the fall and winter; west-southwest in the summer; and west in the spring. The average and maximum wind speeds and prevailing wind direction measurements at the Support Site were comparable to wind speed and prevailing wind direction measurements reported for



other regional meteorological monitoring stations and were considered representative of seasonal and long-term conditions for the study area.

Meteorological tower formerly at Support Site in Gricignano.

Temperature

The hourly average temperature for the annual period ranged from a low of 27 degrees Fahrenheit (°F) in winter to a high of 95°F in early fall. The maximum reported temperature in summer was 94°F. The annual average temperature for the Support Site was 61°F. Average 1-hour seasonal temperatures ranged from 46°F in winter to 76°F in summer. Historical temperature records for the Naples, Italy, region indicate that minimum and maximum temperatures have ranged from about 25°F in winter to 98°F in late summer. This information indicates that the temperature measurements reported at the Support Site were representative of seasonal and long-term temperature conditions for the study area.

Barometric Pressure

Support Site barometric pressure measurements were lowest in the spring (28.79 inches of mercury [“Hg]) and greatest in the winter (30.42“Hg). The large difference in maximum and minimum barometric pressure measurements in winter and spring were responsible for greater maximum and average wind speeds during these seasons. This range of barometric pressure was comparable to pressure measurements at other regional locations. The annual average barometric pressure was 29.88”Hg.

Rainfall

Total annual rainfall at the Support Site over the period of record was 36.2 inches, which is comparable to annual rainfall amounts in the Naples region. At least 75 percent of the annual total rainfall occurred in fall (9 inches) and winter (18.1 inches). This trend in precipitation was representative of rainfall patterns in the Naples region. The driest season of the year was summer, with only 1.4 inches of rain. Total rainfall in the spring was 7.8 inches. The maximum amount of rainfall in a 1-hour period was 1.1 inches, which occurred in the summer.