## Where the Bombs Are

Robert S. Norris Hans M. Kristensen

Robert S. Norris works at the Natural Resources Defense Council and Hans M. Kristensen at the Federation of American Scientists. These excerpts are from their Nuclear Notebook, from the current number of the Bulletin of the Atomic Scientists. Katharine Lee Bates, the author of 'America the Beautiful', could not have been referring to the expanse of the US nuclear arsenal when she penned the lyric 'from sea to shining sea', but it is fitting. Though it is the smallest it has been since 1958, the US nuclear arsenal continues to sprawl across the country, with thousands of weapons deployed from the coast of Washington State to the coast of Georgia and beyond.

In total, we estimate that the United States deploys and stores nearly 10,000 nuclear weapons at 18 facilities in 12 states and six European countries. The Pentagon developed this extensive network of installations over the past six decades in order to ensure the survivability of its nuclear arsenal. Post-Cold War base closures and arms reductions led to the consolidation of weapons at the current facilities; the number of weapons and their locations will change as the Pentagon implements the June 2004 Nuclear Weapons Stockpile Plan and the 'New Triad'.

Pinpointing the whereabouts of all US nuclear weapons, and especially the numbers stored at specific locations, is fraught with many uncertainties due to the highly classified nature of nuclear weapons information. Declassified documents, leaks, official statements, news reports, and conversations with current and former officials provide many clues, as do highresolution satellite images of many of these facilities. Such images are available to anyone with a computer and internet access, thanks to Google Earth and commercial satellite imaging companies such as DigitalGlobe. This development introduces important new tools for research and advances citizen verification. The statistics contained in this article represent our best estimates, based on many years of closely following nuclear issues.

The nuclear weapons network shrank during the past decade, with the Pentagon removing nuclear weapons from three states (California, Virginia, and South Dakota) and the size of the stockpile decreasing from about 12,500 warheads to nearly 10,000. Consolidation slowed considerably compared with the period between 1992 and 1997, when the Pentagon withdrew nuclear weapons from 10 states and several European bases, and the total stockpile decreased from 18,290 to 12,500 warheads.

Approximately 62 per cent of the current stockpile belongs to the air force and is stored at seven bases in the United States and eight bases in six European countries; the navy stores its weapons at two submarine bases, one on each coast. None of the other services possesses nuclear weapons.

The ballistic missile submarine base at Bangor, Washington, contains nearly 24 per cent of the entire stockpile, or some 2,364 warheads, the largest contingent. The Bangor installation is home to a majority (nine) of the navy's nuclear-powered ballistic missile submarines and a large number of surplus W76 warheads that will eventually be retired and disassembled. Its counterpart on the Atlantic coast, Kings Bay Submarine Base in Georgia, is the third-largest contingent, with some 1,364 warheads. Each base stores approximately 150 nuclear sea-launched cruise missiles.

Minot Air Force Base (AFB) in North Dakota, with more than 800 bombs and cruise missiles for its B-52 bombers and more than 400 warheads for its Minuteman III intercontinental ballistic missile wing, has the largest number of active air force weapons. The other B-52 wing at Barksdale Air Force Base in Louisiana has more than 900 warheads, and Whiteman Air Force Base in Missouri has more than 130 bombs for its B-2 bombers.

The large underground facility at Kirtland Air Force Base in Albuquerque, New Mexico, stores more than 1,900 warheads that are either part of the inactive/reserve stockpile or awaiting shipment across Interstate 40 to the Pantex Plant outside of Amarillo, Texas, for dismantlement. The 970-acre facility at Nellis Air Force Base, Nevada, north-east of Las Vegas, performs a similar function, storing approximately 900 warheads in 75 igloos – 'one of the largest stockpiles in the free world', according to the air force.

During the Cold War, the United States deployed a large percentage (up to onethird) of its nuclear weapons in other countries and at sea. At its peak arsenal size in the late 1960s, the United States stored weapons in 17 different countries. By the mid-1980s, there were about 14,000 weapons in 26 US states, 6,000 more at overseas US and NATO bases, and another 4,000 on ships at sea.

The United States terminated many nuclear missions after the end of the Cold War and retired the weapons. It withdrew all of its nuclear weapons from South Korea in 1991 and thousands more from Europe by 1993. The army and Marine Corps denuclearised in the early 1990s, and in 1992 the navy swiftly off-loaded all nuclear weapons from aircraft carriers and other surface vessels. By 1994, the navy had eliminated these ships' nuclear capability, and many air force, navy, and army bases and storage depots closed overseas as a result. Today, perhaps as many as 400 bombs remain at eight facilities in six European countries, the last remnant of a bygone era.