A Long War? Weather as a "Four-Edged Sword"

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October 29, 2001

The war in Afghanistan seems to be one of almost endless complications and weather is certainly one of them. Historically, the winter has brought a near halt to ground conflict in mountainous areas although it never halted Russian air operations, long range artillery operations, supply operations, or limited Spetznaz (special forces) operations during the FSU attempt to defend a Soviet puppet regime in the country. It has also greatly slowed the tempo of all operations in the country, even in lower altitude areas where the weather does not have that much of an effect.

This war, however, will be different in many important ways. Some will benefit the US and some the Taliban. Some will hurt parts of the Afghan opposition but possibly aid others, and some will hurt the humanitarian relief effort while others may actually aid it. If winter and a long war are analyzed in terms of each of these different effects, weather becomes a "four-edged sword," potentially benefits and hurting each side in different ways. It also becomes a major experiment in modern warfare. No side will really have fought in this way before, and much will depend on how well each side adapts to real-world circumstances.

The Background

It is tempting to talk about Afghanistan as if it were a geographic unit, and as if the "fierce Afghan winter" coverage the country. It doesn't. It has far more effect in the higher altitudes in the center of the country and in mountain areas than in the lowlands and the south. NOAA provides the following broad description of the weather in Afghanistan: Afghanistan is a mountainous country the size of Texas with a north-south distance roughly equal to that from Central Virginia to Southern Florida in a dry part of the world extremes of climate and weather. The country experiences dry summers, and wet winters to early springs, but the country on the whole is dry. Cloud cover is generally low by the standards of most countries. Average annual precipitation at Chakhcharan, one of the highest major cites in the central mountains, is only 204.4 mm (8.05 in.), and at Kabul is 312.0 mm (12.28 in.).

The extremes in temperature can be illustrated by two examples: Chakhcharan and Kabul. Based data provided by Afghanistan ten years ago, temperatures can range from -46.0 deg C (-51 F) (which occurred in Chakhcharan during February) to 37.7 deg C (100 F) (which occurred in Kabul in July) (years not reported). October temperatures average 6.9 deg C (44 F) in Chakhcharan (which is at an elevation of 2,183 meters, or 7,162 feet, in the southeast part of the country) to 13.1 deg C (56 F) in Kabul (at an elevation of 1,791 meters, or 5,876 feet, in the east central section). October extremes range from -14.6 deg C (6 F) to 27.5 deg C. (82 F) in Chakhcharan, and from -3.0 deg C (27 F) to 31.6 deg C (89 F) in Kabul. The snow season varies with elevation, but averages roughly November-March in Kabul and October-April in Chakhcharan.

These averages tell little about cloudiness and wind. Based on average monthly wind speed, spring and summer are the windiest part of the year, and fall and winter the least windy. However, it can be windy in any season (at Chakhcharan, for example, maximum wind gusts of 18 m/sec (40 mph) have been recorded in November, 28 m/sec (63 mph) in January, and up to 32 m/sec (72 mph) in April). Based on the monthly average number of hours of sunshine, summer is the sunniest season and winter the least sunny time of year. But since there are fewer hours of sunshine each day in winter because the days are shorter, this information says little about cloud cover.

A climate summary generated several years ago in the U.S. from older data provides a little more information. Based on data from four weather stations (in Kabul, Mazar i-Sharif, Herat, and Qandahar), the average cloud cover runs from 0 to 1/8 of sky coverage in summer to 4/8 to 5/8 in the winter months. The percentage frequency of occurrence of low ceiling

and/or visibility (cloud height 3,000 feet or less, or visibility three miles or less) ranges from 1 to 5 percent of the time in the summer months to 11 to 24 percent of the time in January and February. Average number of days per month with fog ranges from zero in the summer months to four days per month in the winter. Average number of days per month with blowing dust or blowing sand ranges from one or two in the winter months to six days per month in July.

Much depends, however, on the part of the country, and most major urban areas are actually in regions with better average weather conditions for air operations during much of the winter and spring than Europe or Kosovo. Weather is only a problem during the winter and spring in the Taliban redoubt at Qandahar and generally is only a moderate problem in most other major cities - although key storms can lock a given city in for days and operating in the heights above cities like Kabul can be extremely difficult:

- Kabul, at 5,876 feet, has its worst weather in terms of cloud cover and precipitation during March and April, not during the winter per se. It has no snow and 4 days of rain in November, 7 days of snow and 2 days of rain in December, 7 days of snow and 2 days of rain in January, 4 days of snow and 4 days of rain in February, 3 days of snow and 10 days of rain in March, and 0 days of snow and 11 days of rain in April. The average high ranges from 40-67 degrees during this period and the lows from 19-43 degrees. There can be periods where movement is extremely difficult and where weather conditions block air operations for days at a time, but the same conditions that block air operations will also block a great deal of Taliban and Al Qaida movement activity.

- Herat, at 3,163 feet, in the Shi'ite West is drier and warmer. It has its worst average weather in terms of total cloud cover and precipitation during the winter, but this weather does not interfere with military operations in many cases, and may actually aid low altitude helicopter attacks and air drop missions by limited Taliban movement.. It has no snow and 3 days of rain in November, 5 days of snow and 1 day of rain in December, it has 2 days of snow and 6 days of rain in January, 2 days of snow and 8 days of rain in February, 1 day of snow and 8 days of rain in March, and 0 days of snow and 7 days of rain in April. The average high ranges from 48-75 degrees during this period and the lows from 27-48 degrees. The area to the east of Heart, however, climbs in altitude and will have notably worse weather.

- Mazaar e-Shariff, at 1,240 feet, in the Uzbek north, also is drier and warmer. It has its worst weather in terms of cloud cover and precipitation during March. It has no snow and 3 days of rain in November, 1 day of snow and 5 days of rain in December, it has 4 days of snow and 4 days of rain in January, 3 days of snow and 7 days of rain in February, 1 day of snow and 10 days of rain in March, and 0 days of snow and 9 days of rain in April. The average high ranges from 48-76 degrees during this period and the lows from 28-52 degrees. Once again, bad weather can block air operations for days, but the same bad weather also affects Taliban and Al Qaida mobility. The fact opposition forces tend to be concentrated in higher altitudes to the south of Mazaar e-Shariff could, however, be a problem.

- Chakhcharan, at 7,162 feet, in the central Shi'ite highlands, is colder, but still has many clear days. Snow can block most vehicle movement and even foot and horse travel for extended periods. Chakhcharan has its worst weather in terms of cloud cover and precipitation during March and April but much of this is rain. It has 2 days of snow and 3 days of rain in November, 7 days of snow and 2 days of rain in December, it has - days of snow and 8 day of rain in January, 9 days of snow and 9 days of rain in February, 5 days of snow and 6 days of rain in March, and 1 day of snow and 8 days of rain in April. The average high ranges from 48-76 degrees during this period and the lows from 28-52 degrees.

As a result, most urban areas will be open to air and helicopter operations during most of the winter. Much also depends on the road net, and Afghanistan's road net tends to circle the mountains in the center with entry points from each border. US and Russian competition, and Russian activity during the FSU's occupation of Afghanistan, created a fairly good road net around Kabul and Qandahar, with "all weather" routes moving south from Uzbekistan across the Freedom Bridge. Less developed routes go west from Iran to Heart and a fairly good network exists in the southwest from Iran/Shindand/Farah/Kang to Qandahar. Acceptable roads go to Herat from Mazarr e-Shariff. Some of these roads are badly worn but the major problems exist in the central mountains and in the Northeast along the supply routes from Tajikistan to the Tajik Northern Alliance forces above Baghram air base and Kabul. These roads have been chewed to pieces, have no real tunnels, and some passes may already have been closed. It should be noted, however, that animals often are far more able to move in winter than trucks, and many areas closed to vehicles can still be reached and supplied by horse and donkey.

Air transport and air drops will also be a critical factor. Air drops will be wind as well as cloud cover dependent, but GPS allows reasonably accurate air drops at any time when the wind is limited. There are many major air bases and large numbers of airfields, but the US is now the only power really capable of using them, and most would not require some repair. The fields near Heart, Shindand, and Mazaar e-Shariff offer reasonable all weather options. So would Baghram,

Kabul, and Qandahar. Higher altitude strips would be a major problem, and even touch and go air resupplies with C-140s and C-130s would be difficult. Airfield security would also be a major problem.

The Problem of Humanitarian Relief

One edge of the four-edged sword is humanitarian relief. It is true that the Taliban would have left some 350,000-700,000 Afghans on the edge of starvation this winter even if the US have never attacked. Some estimates put the total as high as seven million after nearly three years of drought, massive problems for relief organization, and zero efforts at economic development. It is the US and Britain, however, that are now likely to get the blame as things get worse during the winter.

The US ability to drop virtually anywhere where it can trust the spotters on the ground to give the right coordinates is an advantage in dealing with this crisis. Air drops, however, cannot easily provide shelter or medical treatment, and make it hard to build up sustainable surpluses. This situation, however, would change radically if the US could get functioning air facilities at Herat, Mazaar i-Shariff, or near the Northern Alliance forces in the Northeast, or secure an open road out of Iran or across the Freedom Bridge from Afghanistan - or if the Taliban permitted the free flow of UN aid.

The Problem of Air and Missile Strikes and Special Forces Operations

The second edge of the sword is US combat airpower. From World War II on, every side under air attack has learned to exploit weather and cloud cover quickly. This was a critical factor from Vietnam to Kosovo. At the same time, bombers and strike aircraft flying above cloud cover can use GPS guided bombs like the JDAM to strike in any weather, and GPS coordinates can be called in from friendly, Special Forces, or CIA spotters.

The use of laser-guided weapons requires relatively clear conditions although some suggest that "lock on" is far more stable if ground based teams illuminate at ground level than with other aircraft doing the lock on.

As a result, the US should be able to both operate with considerable freedom from the air over most major target areas during around half of the winter days in each major target areas, and operate even in some bad weather. On clear, cold days the US may even benefit from snow and clod weather because thermal vision devices and reconnaissance satellites, UAVs, and aircraft will actually see a far higher heat contrast than in normal weather. Active vehicles, concentrations of people, and movement inside and around caves and buildings will be clear detectable during both day and night.

Special forces and modern attack helicopters can fly and operate in relatively bad weather, and far worse weather than most combat and commercial aircraft, although they still need a clear line of sight for most attack missions. It may actually be easier to fly air drop, resupply, and insertion missions because the Taliban and Al Qaida will have to concentrate in their garrisons in areas with truly poor weather, and this may force them to concentrate as targets.

US and British forces on the ground will have far better winter gear and special sensors and weapons than the average Russian troops, although the endurance of Afghan troops in winter has historically been amazing and they know the ground. Actual foot traffic can be difficult to impossible in higher areas, and it is extremely difficult to move without leaving tracks of some kind. Fires are easily detected, and steep slopes often prevent the use of ice-blocked paths. Us and British forces will, however, have the advantage of night vision devices with thermal imaging capability, GPS to locate themselves, satellite data links, and the ability to target GPS and laser guided weapons. These are advantages that Russian Spetsnaz did not have.

Any major sudden storm or wind and any search and rescue operations in bad weather could also be a major problem.

In broad terms, operational tempos may drop because of weather, and much depends on the ability to acquire valid targets with precise coordinated in bad weather - a key potential mission for special forces and the opposition -- but the US will scarcely be paralyzed.

The Problem of Allied and Opposition Forces

The third edge of the sword is opposition forces. Weather will be a major problem in resupplying the Northern Alliance forces in the Panjshir Valley and north of Kabul, although air drops could take place. They do not hold much of the plains, and now have no rear area airfields other than those that can take helicopters - although the MH-47 can carry significant cargo. Winter will delay or limit any Russian resupply or US effort to equip the Northern Alliance with armor and more artillery. At the same time, Taliban forces will have their own movement problems and thermal imaging will somewhat improve US targeting and air strike capabilities.

Opposition forces in the higher areas will have major problems in moving but so will the Taliban. Air drops and helicopter operations will still be possible. The opposition forces may find it easier to infiltrate and attack any small Taliban garrisons partially isolated by the weather.

The winter may favor Shiite opposition forces in the West in areas like Herat, and in the Uzbek/Tajik forces around Mazaar e-Shariff by limiting Taliban resupply and/or channeling it into routes easier to survey and attack. Snow and cloud cover can be problems in providing air support, however, and the Taliban may keep an edge in terms of motorized mobility. It is unclear that weather matters, but it will be very difficult to resupply either group with armor although some light artillery could be air dropped or choppered in.

Taliban and Al Qaida Forces

The final edge of the sword is what happens to the Taliban/Al Qaida forces. For the reasons outlined earlier, they will have some weather cover in some areas. The Northern Alliance forces in the Northeast will also be weakened.

At the same time, they will remain vulnerable to air operations around Kabul and Qandahar, have increased targetability problems, have more potential difficulty in operating in hostile ethnic/clan areas, and can scarcely operate out of caves blocked by the snows. At the same time, the US will find it extremely difficult to pick out Taliban and Al Qaida targets in populated areas and winter will not stop either from systematically embedding its operations in populated areas and using them as cover. The weather also has less effect in the low-lying areas, and there are still many caves and other underground irrigation canals that can be used as shelters. Forward deployed equipment does not have to be used regularly, which means it will not show up on thermal imaging, and it is difficult to separate the military trucks that the Taliban and Al Qaida rely on from those used by civilians. Foot soldiers do not use uniforms and it will often be hard to tell them from civilians unless they are active on the front lines.

Making an Estimate

No one really wins the weather side of the war, and rates of operations are likely to decline in most areas. At the same time, much depends on how well each side approaches the tactics and problems in specific areas, and there really can be an "all weather" war. The US will probably lose on the humanitarian political front and in terms of Northern Alliance movement towards Kabul. It may win in terms of other opposition forces, air strike effectiveness, and some Special Forces operations.

Afghan War Topics

10/25/01	The Lack of Battle Damage Assessment Data
10/24/01	Background to the War