Acclimatization, Disposition and ADF Readiness

An ASPI 'Quick Look' brief

The peacetime geographic disposition of ADF units is a mixture of historical legacy, strategic imperative and practicality. Those major changes that have occurred in the last several decades – the move of Army to the North, two-ocean basing for Navy and the establishment of a permanent air base at Tindal – reflect the strategic logic of the 'Defence of Australia' doctrine. Other factors that have influenced the locating of ADF units include access to transportation facilities for deployment, proximity of civil support and the desirability of the location to personnel and their families. In each case compromises have been made between strategic imperatives and practical realities.

The basing of so much of the Army in the North is (or at least was) predicated on the judgement that they would operate in that part of the continent if a war arose. Now that Army has been given an explicit expeditionary role, the question naturally arises as to whether it would be better to have more of the force consolidated nearer to the southern population centres and transportation hubs. This question has been given added urgency by the challenge of maintaining Army personnel numbers – a task made difficult by northern basing away from family support networks and spouse employment opportunities.

However, even if the judgement is made that the Army is unlikely to ever operate in the north of Australia, there remains a strong argument for northern basing; it ensures that personnel are acclimatized for quick deployment to hot climates.

What is heat acclimatization?

The body's biological adaptation to working in a hot environment is called heat acclimatization. Depending on the fitness of the individual, this can take between one and two weeks. A typical acclimatization regime involves progressively greater periods of daily exercise in hot conditions, commencing with 2 hours of exercise and building up over the first week. Acclimatization to hot and dry conditions (deserts) and hot and humid conditions (tropics) differs, although adaptation to one environment markedly improves the ability to work in the other. Heat acclimatization is retained for about a week following return to a cool environment but will degrade by 75 percent after around three weeks.

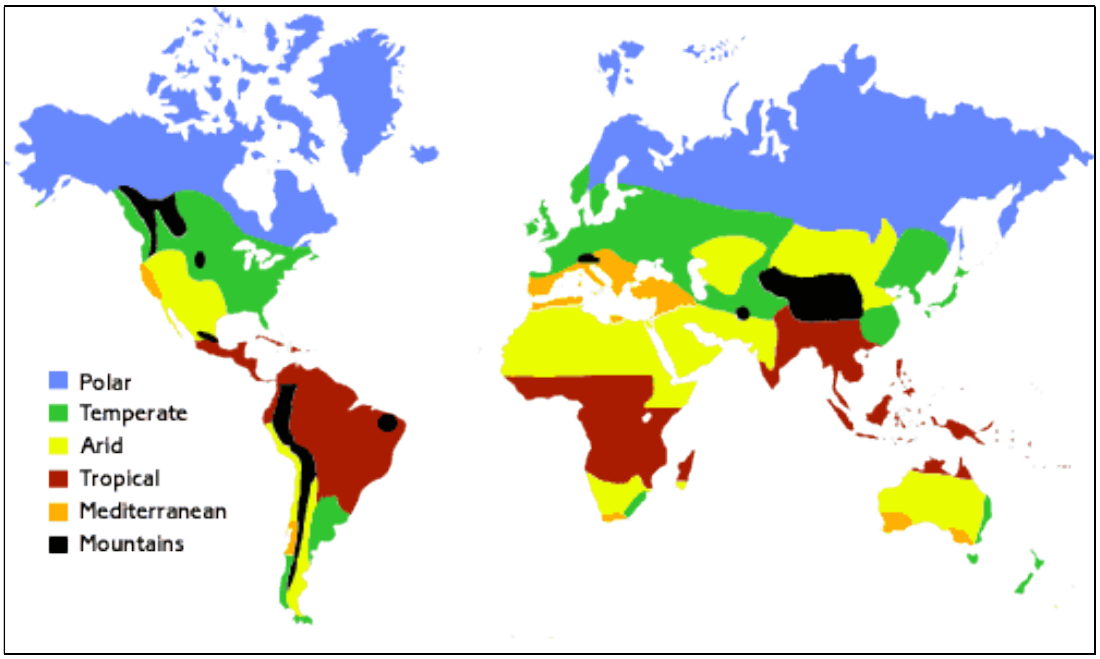
The benefits of acclimatization include: improved thermal comfort; reduced core temperature; earlier and greater sweating; lower body-heat production and earlier skin blood flow. In addition, exercise performance is improved, heart rate is lowered, thirst is improved, salt loss is reduced and internal organs are better protected from damage. This translates into reduced risk of heat stress and illness, along with improved performance. Conversely, if personnel are required to do heavy physical work prior to acclimatization then performance is poor, climatic adaptation is retarded and the risk of heat casualty is high.

Because land operations demand hard physical work outdoors, the imperative for acclimatization is arguably greatest in the case of Army, although many of the same challenges will also arise for the Air Force particularly their ground support elements. Navy, given the slow and contiguous nature of sea travel, faces somewhat less of a challenge.

Why does it matter?

Acclimatization is important because the entire region to our immediate north is tropical, see Figure 1. Thus, for deployments into this region, personnel who are not based in northern Australia will need to undergo a period of acclimatization (either in transit or in-theatre) prior to commencing operations.

Figure 1: Global climate zones (Koeppen classification)



Source: HM Meteorological Office, London UK.

Whether this is a problem depends on how urgent the deployment is, since, all other things being equal, acclimatization will delay the commencement of operations by one to two weeks.

Readiness

The readiness notice (the minimum period of time *planned* between receiving notice of deployment and actual deployment) of ADF units is classified. However, indicative figures range from 24 hours for some small high-readiness force elements up to 12 months for Reserve forces. As far as Army goes, the two regular brigades in Darwin and Townsville that are probably on 28 days notice with at least one battalions available at 7 days notice. Other lower readiness Army units are on 90 to 180 days notice to move. Navy and Air Force similarly maintain force elements at a similar range of readiness notices.

For those force elements at long readiness notice (90 to 180 days) the issue of acclimatization is probably not critical since adequate time is available to either mount the deployment through the north of Australia or conduct acclimatization in-

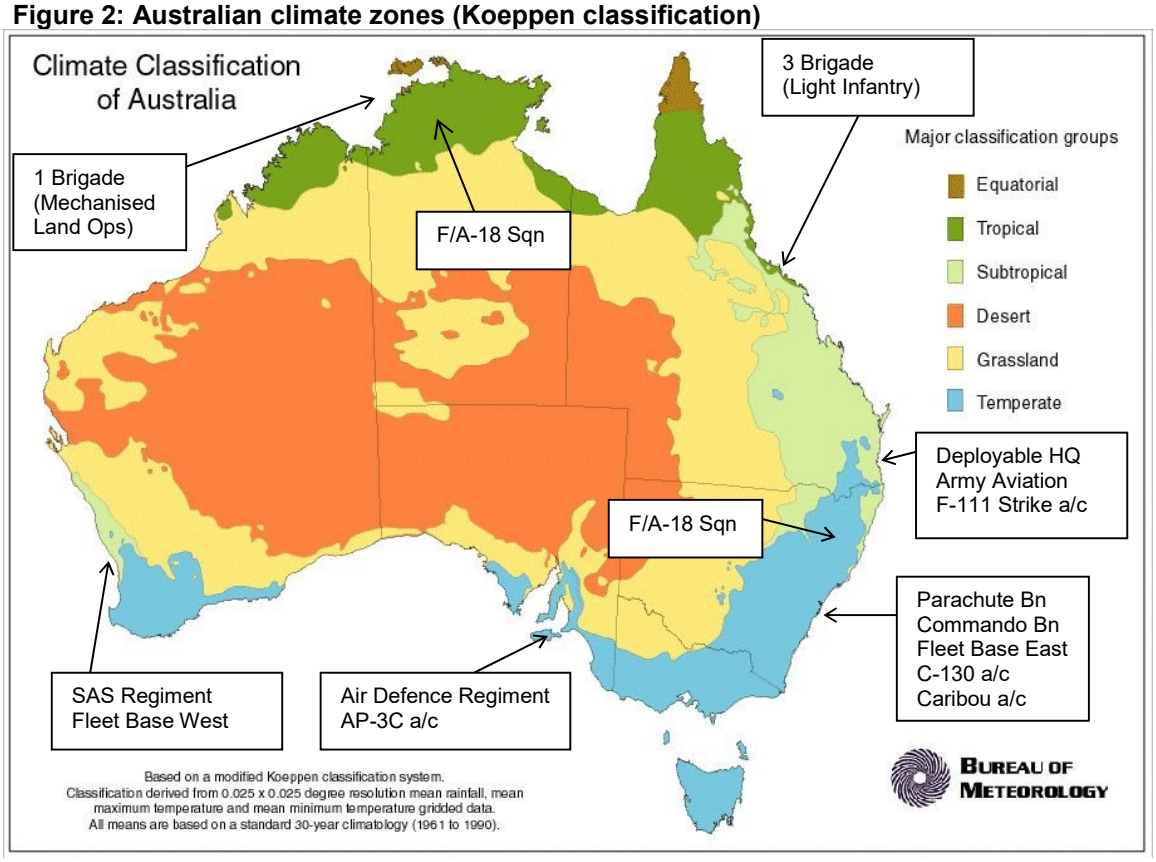
theatre prior to the commencement of operations. For those elements on short readiness notice (7 to 30 days) acclimatization is problematic if the personnel are not already adapted for work in hot climates.

Any discussion of military readiness needs to be tempered with the reality that, in practice, readiness notices will sometimes be ignored and force elements deployed more quickly. This even has a name; it's called 'crashing through' readiness notice.

Comparing disposition and climate

Figure 2 shows the disposition of key force elements of the ADF superimposed with the major climate areas for Australia. To avoid over-cluttering the diagram, only those force elements likely to be deployed at relatively short notice have been included.

Figure 2: Australian climate zones (Koeppen classification)



Source: Australian Bureau of Meteorology.

As can be seen in Figure 2, with the exception of the northern-based patrol boats and hydrographic vessels, most of the Navy is home-based in temperate climates. However, given the time taken to physically deploy vessels to the tropics and the nature of on-board facilities, the acclimatization of crews is not an impediment to speedy deployment.

Almost all of Air Force is located in temperate or sub-tropical climates. The notable exception is the F/A-18 squadron at Tindal. Consequently, acclimatization would have to be taken into account when establishing a forward air base in the tropics. In some cases this could impede initial operational effectiveness and/or delay final deployment.

From a practical point of view the challenge of acclimatization is greatest for Army personnel. Fortunately, the current disposition of the land force circumvents this problem to an extent. Specifically, the Army's two high readiness brigades in Darwin and Townsville are located in tropical climates. This means that at almost any time, the government can deploy a land force up to brigade group size without having to allow for a period of acclimatization.

However, other important and potentially quickly deployed Army units are located in temperate climates including the air defence regiment, parachute battalion (3 RAR) and the SAS regiment (and to a lesser the commando battalion – 4 RAR). In each case the capability provided by these units is unique. It does not take a lot of imagination to envisage a situation where, for example, the parachute battalion is required to jump in and secure an airfield in our tropical north at very short notice. In such a circumstance, the lack of acclimatization would be a real concern

Conclusion

Remembering that the disposition of the ADF is a compromise between many competing factors the following conclusions can be drawn:

- Acclimatization presents few, if any, challenges to Navy irrespective of disposition.

- The disposition of Air Force is not optimal for the rapid establishment of forward operating bases in the tropics but given the nature of air operations the current situation is workable.

- From the point of view of acclimatization, the current disposition of Army elements provides unhindered options for the rapid deployment of both light infantry and mechanized forces into the tropics. Any withdrawal of forces to the south would degrade this capacity.

- Several specialist army units that might be deployed quickly are not well positioned from the point of view of acclimatization especially when the extremely demanding nature of their role is taken into account. This is especially true of the SAS regiment and parachute battalion.