

Chapter 1

Extreme Cold Weather (ECW) Clothing

1.1 USAP Clothing Issue

Refer to the USAP Participant Guide for a list of the clothing you will receive before deployment to Antarctica at the Contractor Warehouse in Punta Arenas, Chile, or from the Clothing Distribution Center (CDC) in Christchurch, New Zealand, before deployment to Antarctica.

The USAP provides basic ECW clothing. If you are going to be in the field for an extended period, you should supplement the issue clothing with additional items such as extra thermal underwear, light-weight wool or thermax socks, 100-weight pile top and bottoms, extra wool, poly-pro and pile gloves.

Prevention—How to stay warm:

- **You need fuel to burn.** Eat before you go out, stay hydrated, and take extra food and water. That's your internal furnace.
- **Dress in layers.** Start with polypropylene underwear, no cotton (cotton clothing gets wet and stays wet; it is dangerous in the cold). Intermediate layers should be polar fleece,

down, or wool: Bibs, pants, sweaters, down vests etc. Your outermost layer should be wind-proof (and depending on where you're working, waterproof). When you're working up a sweat, take layers off. When you stop, put the layers back on, bundle up, pull up your hood, put your back to the wind, and trap all that heat you've generated. As you've most likely heard, you can lose a great amount of your body-core heat through your head and neck. Warm hats, neck-gaiters, face masks, and balaclavas, with goggles or glacier glasses, make a tremendous difference in staying warm on the trail. In a marine environment always wear a Float Coat or Float Coveralls when working around the water or on marginal sea ice.

- **Exercise is heat.** The quickest way a person can warm up is by exercise. If you're cold, get moving. Get to a shelter/ set up a shelter.

1.2 Dressing for the Cold: Layering

In general, the rule of thumb for living in a cold environment is to get lots of insulation between you and the environment, and to remove that insulation layer by layer when you get warmer. You need a clothing system that allows you to shed layers quickly and easily before you get damp from perspiration. Several thinner garments will serve this purpose better than one bulky overcoat.

- **Long Underwear:** Your first layer should be your long underwear. It should fit snugly against your skin and be made of a nonabsorbent material. This layer works by wicking away water and keeping your skin dry. Synthetic fabrics such as polypropylene work the best, whereas wool and silk are the best natural fibers. Cotton is a poor choice because it absorbs water and holds the water next to your skin where it will cool you off.
- **Mid Layers:** The next layers are important because they serve to absorb the moisture out of your long underwear and transport it to the environment through evaporation. Once again, synthetics are best here, but wool is a good substitute. Shirts, sweaters, and trousers are what you will likely be wearing when you are active. Pay close attention to the fit, as the mid layers work by trapping air and preventing it from circulating and carrying away your body heat.
- **Insulation Layer:** Thickness is warmth. For sedentary activities or extremely cold conditions, an outer garment with several inches of loft is recommended. Down, Polarguard[®], Holofill[®] Thinsulate[®] and Primaloft[®] are the types of insulation that the USAP uses in the ECW gear. For personnel working in the Peninsula area it is important to understand that down loses most of its loft when wet and takes a long time to dry, so you must be careful to avoid

getting down garments wet. Synthetic insulation is a better choice for working in potentially wet conditions.

- **Shell Layer:** The most important part of your layering system, and the most used besides your long underwear, is your windshell. Studies conducted by Recreational Equipment Co-Op show that in still air, windshells worn over any garment can add up to 25 degrees F of warmth. In windy conditions, windshells can increase warmth by 50 degrees F or more.

Personnel working in the McMurdo system are issued a windshell that is windproof but not waterproof. Because of the dry climate, the non-waterproof fabrics are superior because they allow your perspiration to escape more easily. Personnel working in the Peninsula area are issued a waterproof/breathable windshell because of the potentially wet conditions encountered there.

1.3 Cold Weather Clothing Accessories

Conditions in Antarctica are frequently extreme. Remember that you need to pay particular attention to protect your head, neck, and extremities with layers comparable to your other clothing. If you'll be doing work that requires much use of your hands, consider requesting chemical heat packs for inside your gloves

and mittens. For work that must be done without heavy gloves or mittens (for dexterity), use the polypro glove liners you are issued.

Important!!: Make sure to bring plenty of high-SPF sunscreen for your field season. Sunscreen is not provided by the USAP.

1.4 Clothing for Deep-Field Deployment by Aircraft (McMurdo Area)

The USAP has basic required standards for clothing that is worn on all flights. All USAP personnel must wear the CDC-issue clothing on flights to and from McMurdo Station and all South Pole flights.

The USAP has made one exception to the basic clothing standard for flights: For personnel going into the deep field, flight clothing can be personal items which are equivalent to or better than the required standard clothing. The USAP recognizes that deep-field personnel may decide to purchase their own clothing for extended periods of field work and has made the exception for these personnel only.

To board a deep-field flight with clothing other than the standard issue, you must have a “Deep-Field Boarding Pass.” Field Safety Training instructors will review clothing procedures during training courses and shake-downs and will ensure that any personal clothing items that researchers wish to substitute for the standard clothing meet or exceed the standard issue. The instruc-

tors will then issue the boarding pass. You will not be allowed on a flight with clothing other than the CDC-issue clothing unless you have a deep-field boarding pass.

1.5 Special Clothing Considerations for Peninsula Operations

During the austral summer months, conditions in the Antarctic Peninsula are characterized by wet, windy weather. Palmer Station can expect to receive about 28 inches of precipitation a year and half falls as rain. During an average summer, precipitation is recorded approximately 22 to 24 days each month. Another consideration is for the often wet conditions one encounters while boating or working aboard a research vessel.

For these situations, a waterproof outer layer is important. The standard USAP clothing issue includes two types of waterproof garments. One is a water resistant / waterproof breathable shell which works well when primarily working on land. The second is the Helly Hansen (HH) non-breathable PVC rain jacket and bib pant. The HH rain wear is generally preferred by researchers spending a fair amount of time working from Zodiacs, where one is likely to get soaked from sea spray. Others prefer the HH gear while working in particularly wet conditions on land such as in penguin colonies where conditions can get rather sloppy. (See Figure 1-1).



Figure 1-1: Very dirty Helly Hansen rain jacket and pants. (photo by Marian Moyher)

Although the issue clothing is of the high quality and generally works quite well under most conditions, some researchers prefer to supplement the issue clothing with personal garments that work best for their activities. For example, a windproof Anorak pull-over with a large kangaroo pouch pocket and side hand warmer

pockets may work best for one group. In addition, some researchers provide their own hiking boots. Be aware that whatever type of boot you choose, make sure they are broken-in prior to deploying, provide good ankle support, and use a high quality vibram lug sole. The rocky terrain on the islands is notoriously rough and very slippery. Other popular items that are often supplemented are the pile fingerless glove/mitten combination (Glomits) and a pile ear band.