



## PSA – Lithium Batteries & Fieldwork

Lithium batteries, either lithium-ion or lithium-metal, are routinely used in fieldwork to support equipment, tools, and instruments. Lithium batteries are arguably the most popular type of battery for fieldwork given their high capacity for energy storage.

However, fieldwork is not always conducted close to campus, which requires equipment, tools, and instruments be shipped to the location. There are a variety of rules and regulations governing the transport of lithium batteries depending on the packaging, the mode of transport, and the destination.

Based on recent experiences, important considerations have been outlined with some (not all!) of the current rules & regulations for reference. This is intended to serve as aid to those planning fieldwork. As usual, please contact [nenglehart@uri.edu](mailto:nenglehart@uri.edu) for assistance shipping lithium batteries or other dangerous goods.

### Packaging

#### 'Loose batteries'

Shipping batteries without the device(s) that they service, results in more regulations. While counterintuitive, this is because batteries are more vulnerable to damage on their own. This requires that the package be 'UN rated' to meet certain performance specifications.

#### Contained in or packed with equipment

There are regulatory exceptions/exemptions for batteries that are shipped in conjunction with the device that they service. Typically, this allows for non-UN rated packaging to be used and rather hard-shell cases (e.g., pelican cases).

### Mode of Transport

#### Ground (highway and railway)

Typically, the cheapest and least regulated form of transportation, but also the slowest and most geographically limited.

#### Air (passenger- and cargo-aircraft)

The most common mode of travel for those shipping to distant locations and/or time sensitive material, but also the most regulated form of transportation. Passenger aircrafts have stricter quantity and size limits for lithium batteries than cargo aircrafts.

#### Maritime (non-research vessel)

Historically, the least utilized mode of travel at URI and reserved for large volumes of equipment with batteries. Typically, ground or air transport is used in conjunction with maritime transport.

## **Destination**

### Domestic

Interstate shipments to the contiguous 48 states is relatively simple, but shipping to the outer reaches of the US (e.g., northern Alaska) and its territories can be tricky.

### International

Certain countries transport more dangerous goods than others, which results in certain countries being easier to ship batteries to than others.

If a lithium-ion battery has a capacity greater than 100 Watt-hours OR if a lithium metal battery has an aggregate lithium content greater than 2 grams, then there may be difficulty shipping to remote destinations based on their governing ability to regulate dangerous goods (aka hazmat). It is generally easier to ship a greater quantity of smaller capacity batteries than a smaller quantity of greater capacity batteries to a remote location.

## **PLEASE READ: RETURN SHIPMENTS!**

When planning fieldwork, ensure that there is someone available where the fieldwork being conducted that can assist with return shipping lithium batteries (e.g., is someone IATA certified to ship dangerous goods?). This is an important consideration for remote locations, because if the lithium batteries cannot be return shipped then they will need to be left with your collaborators. Some of these batteries are very expensive and contain toxic chemicals. Are you willing to leave to leave these batteries behind? Does this location have the means to properly dispose/recycle these batteries?