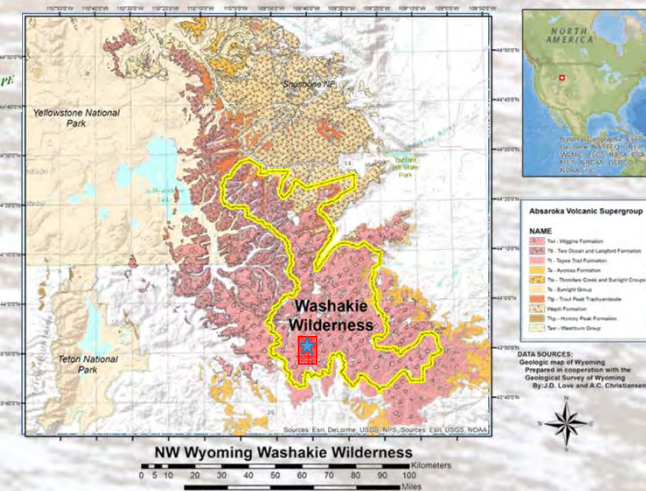
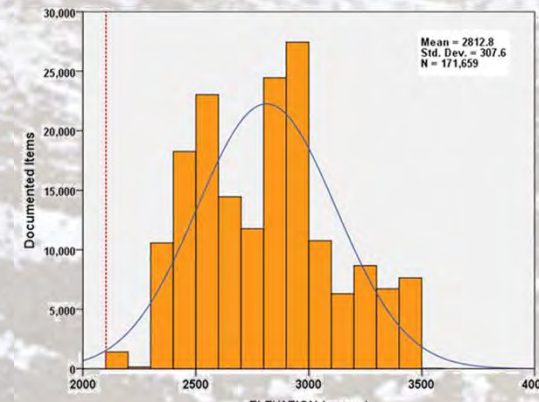


# An Alpine Archaeological Landscape in the Greater Yellowstone Ecosystem, Wyoming

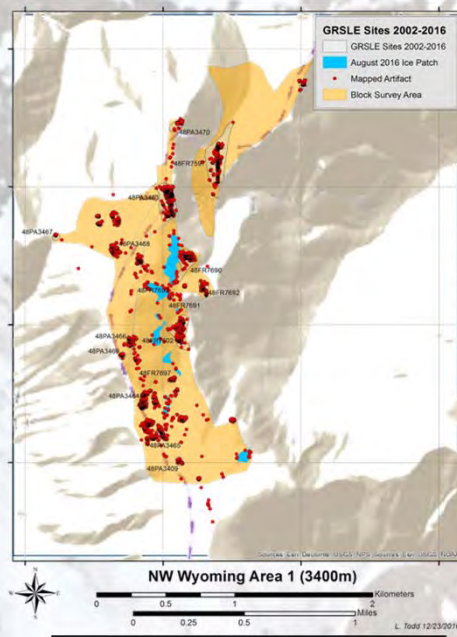
Todd, Lawrence (GRSLE), Rachel Reckin (Cambridge University), Emily Brush (University of Wyoming), Robert Kelly (University of Wyoming), and William Dooley (GRSLE)



Some of the archaeologically least studied areas of continental North America are the Wilderness Areas on the eastern margins of Yellowstone Park.



Since 2002 a high elevation, back country research (the GRSLE project) has recorded locational and descriptive data on over 170,000 prehistoric artifacts in and around the Washakie Wilderness, Shoshone National Forest, Wyoming.



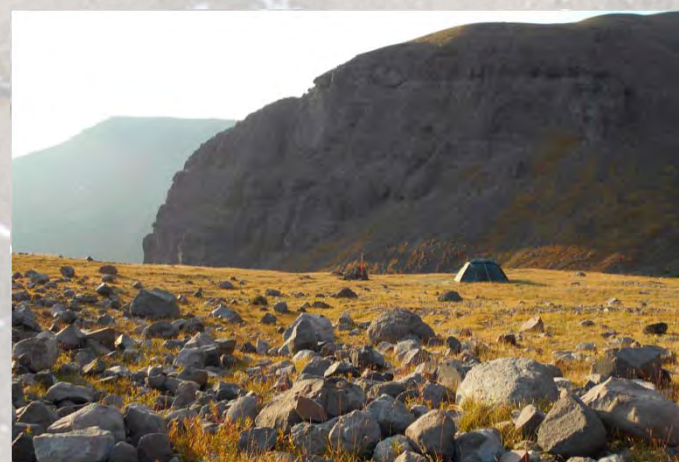
In 2015 & 2016, survey and site documentation focused on a high elevation (~3200-3500m) alpine area with several ice patches that have likely persisted for millennia.



Many models of high elevation use of the Greater Yellowstone Ecosystem (GYE) have emphasized evidence of logistically organized hunting parties using features such as the hunting blinds shown here.



The GRSLE project uses a limited collection, artifact-based perspective to examine landscape scale patterns – hence a considerable amount of field time is spent coding chipped stone.



Logistics of supplying and maintaining field crew in remote areas of the GYE are difficult. Crews occupied the 3200m field camp shown here for 23 consecutive days in 2016.

## ICE PATCHES AND LANDSCAPE ARCHAEOLOGY

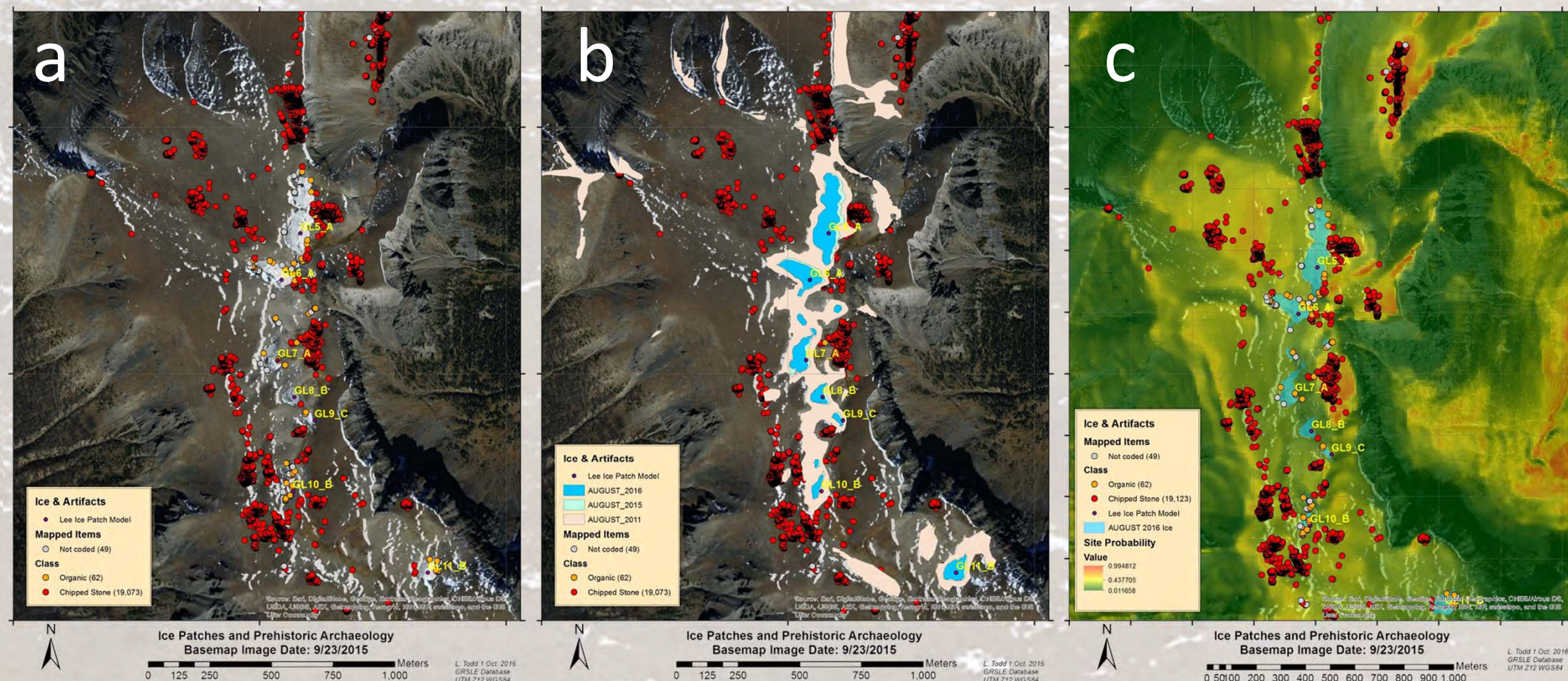
The discovery of rich and diverse organic artifacts and associated paleobiological material from dwindling ice patches has provided an unexpectedly rich addition to global (Reckin 2013) and regional (Lee 2010, Lee 2012) archaeological records. Like the migration corridors, attributes of these features of alpine landscapes are not incorporated in our current site probability models (although variables such as solar insolation, which are part of our recent models, are likely relevant). Beginning in 2015 our team has been examining a series of 11 ice patches that Craig Lee had identified as being persistent and having locational characteristics amenable for the recovery of ancient perishable materials. Of particular note in terms of organic artifacts are two wooden bows recovered in 2015 (Reckin, Kelly et al. 2016).

In addition to the perishable materials, these ice patches are of note because of the very rich associated chipped stone record. Our surface inventory has documented nearly 20,000 pieces of chipped stone in only 174 ha of block survey (artifact density of 112 artifacts/ha). Materials range in age from a complete Alberta Point, to Late Prehistoric. Extensive use is made of locally available petrified wood. Sites include some of the highest elevation stone circle habitation sites recorded in Wyoming (48FR7597, 3277 m and 48PA3465, 3450 m) as well as other large open camps with diverse stone tool assemblages, and other smaller probable special use sites. The ice patch associated archaeology matches the expectations of our general site probability model well. The co-occurrence of high organic preservation potential with high overall site probability seems to point to exceptionally high elevation archaeological research potential landscapes.

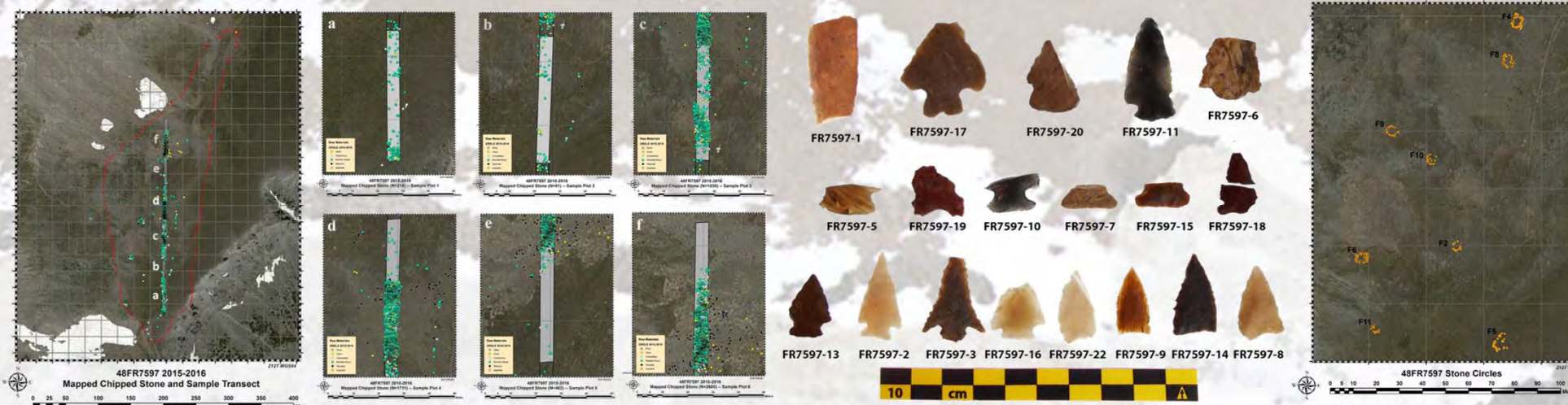


## ABSTRACT

The alpine archaeological record above 3000m of Greater Yellowstone Ecosystem has received much less research attention than the adjacent plains, basins, and foothills. We have been working in an area of NW Wyoming where dense surface stone tool scatters, stone features (including some of the highest elevation habitation stone circles in the region) are associated with dwindling ice patches that have yielded both perishable artifactual material and an array of wood and bone that provides information on past environments. Since 2014, a 175 ha area at elevations from roughly 3,200–3,500m has been inventoried from the artifact-based documentation perspective. Locational and basic descriptive data on nearly 20,000 items have been recorded and provide a glimpse of the complexity and diversity of this high elevation landscape. While there is indeed evidence of big game hunting, there are also indications that the area was used by residential groups in addition to task-specific hunting parties. Data from this inventory are examined in the context of regional landscape distributional patterns.



Documentation of alpine archaeological landscapes includes (a) recording locations and attributes of archaeological materials, (b) monitoring changes in transient features such as ice patches or migration corridors (Todd et al. 2016) that may have influenced both artifact recovery and prehistoric landuse, and (c) building and evaluating site probability models to help direct future research and management.



Although our goal is 100% documentation of the surface archaeological record, in some cases, the size and complexity of alpine sites requires less complete coverage. At site 48FR7597 shown above, we systematically coded materials in a single S-N transect of six 5x50 m sample plots. This roughly 3% sample of the surface resulted in a record of nearly 7000 pieces of chipped stone. Projectile points in the sample plots and other areas of the site represent Paleoindian to Late Prehistoric use of the area – a roughly 10,000 year span of this 3300 m elevation site. In addition to surface materials, have also recorded eight stone circles, one of which was tested and an interior hearth with charcoal samples dated to 2010±30 and 6050±30 BP.

At 3450 m, site 48PA3465 provides evidence of the highest elevation habitation stone circles in the Wyoming GYE. Although even this remote site has suffered artifact theft and few projectile points have been documented, Archaic and Late Prehistoric uses are indicated and Paleoindian points have been found near-by.



Coding chipped stone in 5x50m sample plot 6 at 48FR7597

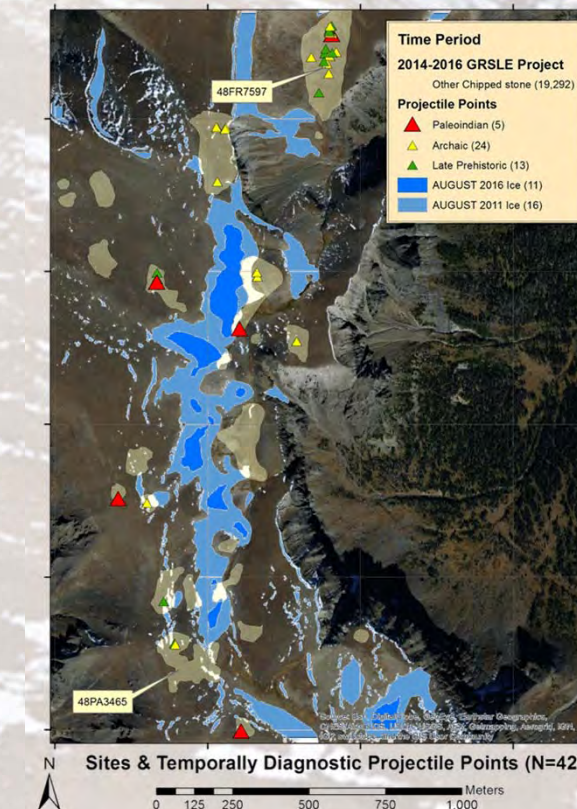


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## CONVERGENT MODELS, AUGMENTED RESULTS

Archaeological field work in the GYE high country has gone hand in hand with an iterative probability modeling effort (Burnett and Otárola-Castillo 2008, Burnett et al. 2014, Burnett and Todd 2009, 2010, 2014, Burnett, Todd, and Wright 2015) that has proved to be an effective way to organize investigations in the largely unexplored Wilderness areas. Work by Craig Lee has taken a different approach to modeling and has focused on prediction of the likelihood that melting ice patches could yield preserved ancient organic materials. In the area described here, both the prehistoric site probability and preserved organics models suggested a high potential for significant archaeological material, which as shown here was indeed the case.

Of particular interest in future investigations is the examination of not only the potential of ice patches to yield rare, spectacular organic artifacts, but also to consider how the locations of both persistent and transient snow and ice patches may have influenced patterning in the more durable stone tool record. The examples presented here give a strong indication that the convergence of ice and stone tool models can provide the potential unexpectedly rich insights into shifting alpine landuse patterns. In the areas described here, indications are that not only could the ice patches been focal points for hunting activities, but also features that may have conditioned decisions on habitation site placement.



In addition to the chipped stone materials, we have recorded a series of specimens melting out of ice patches identified by Craig Lee's model of likely preserved organics. So far we have radiocarbon dates on 19 items from ice patches. Although our oldest dates so far are on non-artifactual wood, proximity of a range of projectile point types suggests that older organic artifacts may be present. Locations of the two stone circle sites (48FR7597 and 48PA3465) are shown in relation to ice patches.



The oldest stone tool, a complete Alberta point (likely 10,000 years or older), was recovered from an ice-melt rivulet just down slope from this ice patch.



The oldest organic artifact recovered from this area is a badly warped, but nearly complete wooden bow (625±26 BP).

## Acknowledgements



2016 field team members included Danial Dalmas, Ylanda White, Kent Houston, Keri Porter, Scott Dersam, Sari Dersam, Sissi Mattox, and Tau. Special thanks to Paul Burnett for his continued work the Shoshone Probability model. Craig Lee's work in identifying ice patches likely to preserve organic materials has been a key to our project. Funding was provided by Wyoming CLG grant to Park County Historic Preservation Commission and by the Shoshone National Forest. Lee Livingston again provided highly skilled, professional outfitting support. Becky Thomas kept things running at the home base.

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