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## Raw material circulation at broad scales in southern Patagonia (Argentina): The cases of the Chico and Santa Cruz River basins



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### ABSTRACT

The purpose of this paper is to begin to understand human mobility through rock transport at different times in two areas with different environmental characteristics: the Southern Deseado Massif and the basaltic canyons north of the Santa Cruz River. We focus on obsidian, which has a clear geochemical signature and an uneven distribution. Additionally, we use macroscopic information on siliceous rocks, which at present have only been identified in northern areas, although they may also be recovered randomly and in low frequencies in southern ones.

During the initial peopling of the Southern Deseado Massif (ca. 10,800 BP), inhabitants were transporting black obsidian as well as translucent chalcedony, probably as part of the individual gear. During the Late Holocene, the number of obsidian artifacts decreased in the Southern Deseado Massif, related to a better knowledge of the high-quality local lithic resources and/or to the existence of higher population densities. Obsidian artifacts are more abundant in the northern Santa Cruz River basin than in the southern Deseado Massif, suggesting the existence of a relationship with areas located to the northwest, close to the obsidian source, as other lines of evidence suggest. In addition, the presence in the basaltic canyons of artifacts made from high-quality siliceous rocks, more abundant and predictable in northern areas, could also be the result of human movements following a north-south direction.

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## 1. Introduction

Human mobility has been an important topic within hunter–gatherer studies (e.g. Binford, 1980; Kelly, 1995; Binford, 2001), and has been evaluated in different ways. While isotopic studies provide direct information on human movements, measured at the scale of the individual, as the time scale variable (e.g. Ambrose, 1993; Richards et al., 2005), the study of raw materials provides a different kind of information, as it measures the area utilized by a group (e.g. Geneste, 1988; Johnson, 1989; Cortegoso, 2008). The quantity of artifacts recovered at a specific archaeological site made from a particular raw material depends not only on the distribution of these rocks but on the frequency of group movements and

discard rate, among others (e.g. Ingbar, 1994). In any case, a good knowledge of the regional lithic resource base (sensu Ericson, 1984) is required in order to understand human mobility.

The purpose of this paper is to begin to explore human mobility by studying the transportation of rocks at different times in two areas with different environmental characteristics: the Southern Deseado Massif and the basaltic canyons north of the Santa Cruz River. We focus on obsidian, which has a clear geochemical signature and an uneven distribution. Additionally, we use macroscopic information on siliceous rocks, which have been identified only in northern areas. The results are considered to be exploratory.

## 2. Study areas

Two areas will be studied: the southern tip of the Deseado Massif and an area located to the south, between the Chalia and Santa Cruz River basins, composed of basaltic canyons. The archaeological sites located in the two areas are separated by a minimum distance of ~140 km.

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The Deseado Massif is a morphostructural region of 60,000 km<sup>2</sup> located near the center of the Santa Cruz Province, which was shaped by volcanic activity during the Jurassic (De Giusto et al., 1980). The region has mineral veins that penetrate the volcanic and sedimentary bedrock, numerous caves, and excellent raw materials for high-quality flintknapping (e.g. Panza et al., 1998; Cattaneo, 2000; Panza and Haller, 2002; Miotti and Salemme, 2003; Cattáneo, 2004; Echeveste, 2005; Paunero et al., 2007; Hermo, 2008; Paunero, 2009; Skarbun, 2009).

Within the southern tip of the Deseado Massif, there are archaeological localities in different environments: La Gruta and Viuda Quenzana (Fig. 1). The first one is dominated by closed depressions in volcanic and sedimentary rocks that may contain seasonal lagoons and occasionally permanent bodies of water. Some 25 km to the north, in the locality of Viuda Quenzana (Fig. 1), seasonal lagoons are less frequent, but there are seasonal streams and even a few large canyons with semi-permanent streams and

springs. Late Pleistocene–Early Holocene dates have been obtained from the archaeological locality of La Gruta (Franco et al., 2010a,b), while both La Gruta and Viuda Quenzana localities have provided early and middle Holocene ages (Aguerre, 2003; Durán et al., 2003; Mancini et al., 2012; Franco et al., 2013). Outside of our study area, in La María locality, 25 km to the east of El Verano, human occupations corresponding both to the Pleistocene–Holocene transition and early Holocene have been identified (Paunero, 2009).

In our study area, dates of ca. 10,840 BP were obtained at La Gruta 1 (Table 1), a site that overlooks a nearby lagoon (Franco et al., 2010a, b; 2013). There is more evidence for human occupation around 9000–8000 BP (Table 1). Archaeological evidence corresponds to the localities of La Gruta, La Martita and El Verano, separated by ~25 km (Aguerre, 2003; Durán et al., 2003; Mancini et al., 2012; Franco et al., 2013). The area shows evidence of occupation until the Late Holocene, although there is no continuous record of occupation at any locality (Aguerre, 2003; Rubinos Perez,

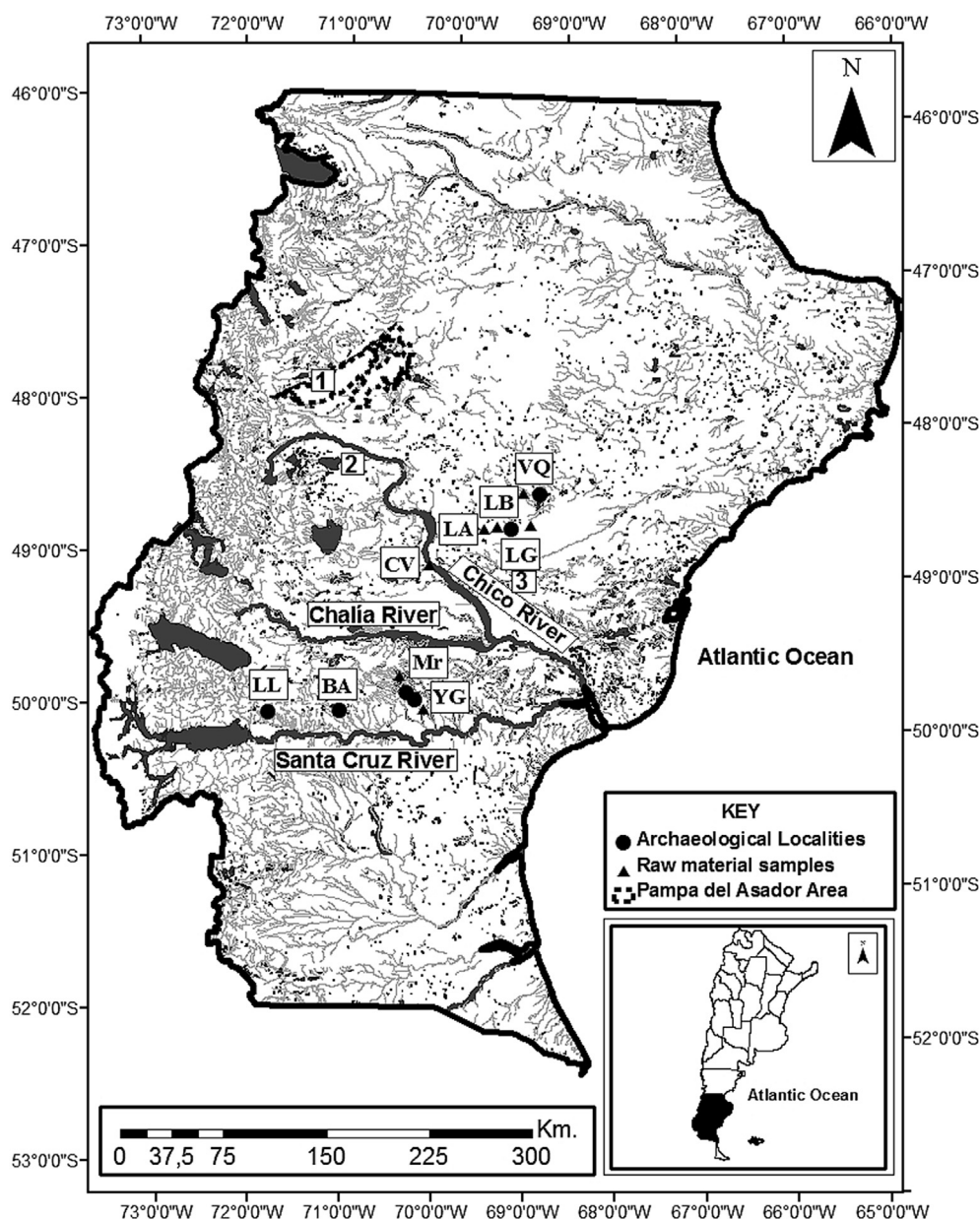


Fig. 1. Map showing main localities mentioned in text. 1. Cerro Pampa, 2. Strobel plateau; VQ: Viuda Quenzana, LG: La Gruta, LB: La Barda, LA: La Alianza, CV: Cerro Ventana, LL: La Laurita, Mr: Mercerat, YG: Yaten Guajen. This figure is based on hydrologic shapes from the Instituto Geográfico Nacional de la República Argentina (2013).

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