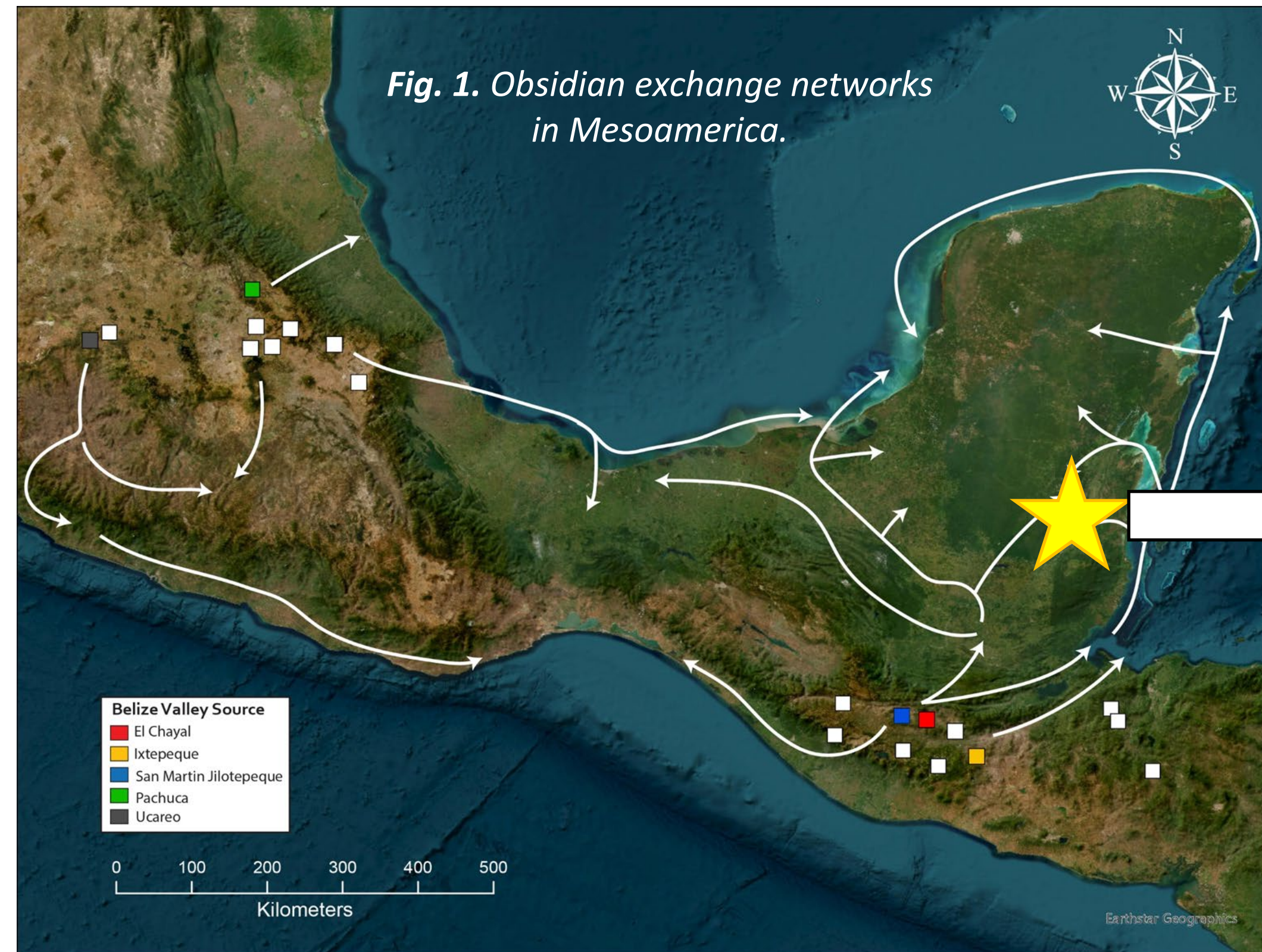


## Mesoamerican Obsidian Blade Production

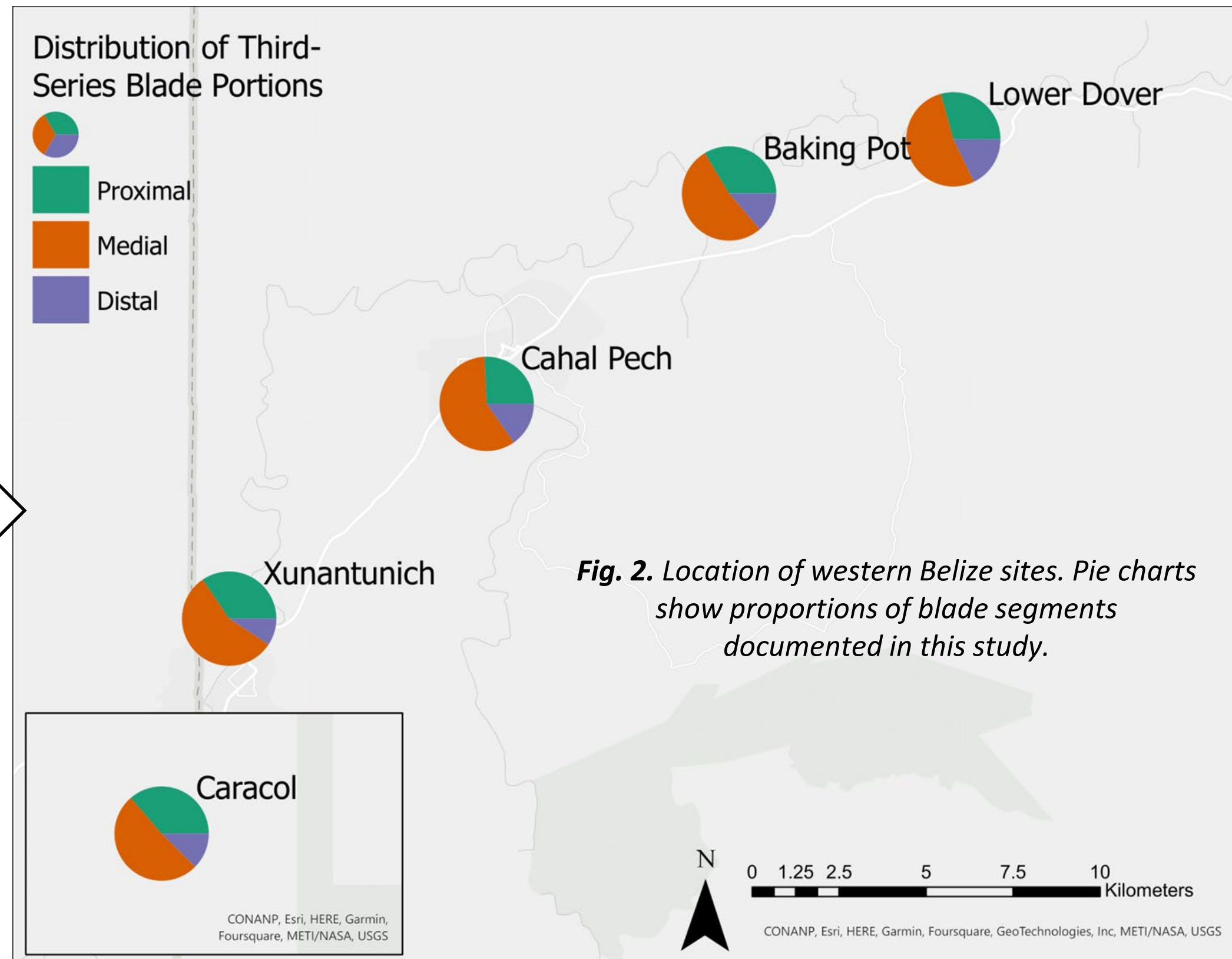
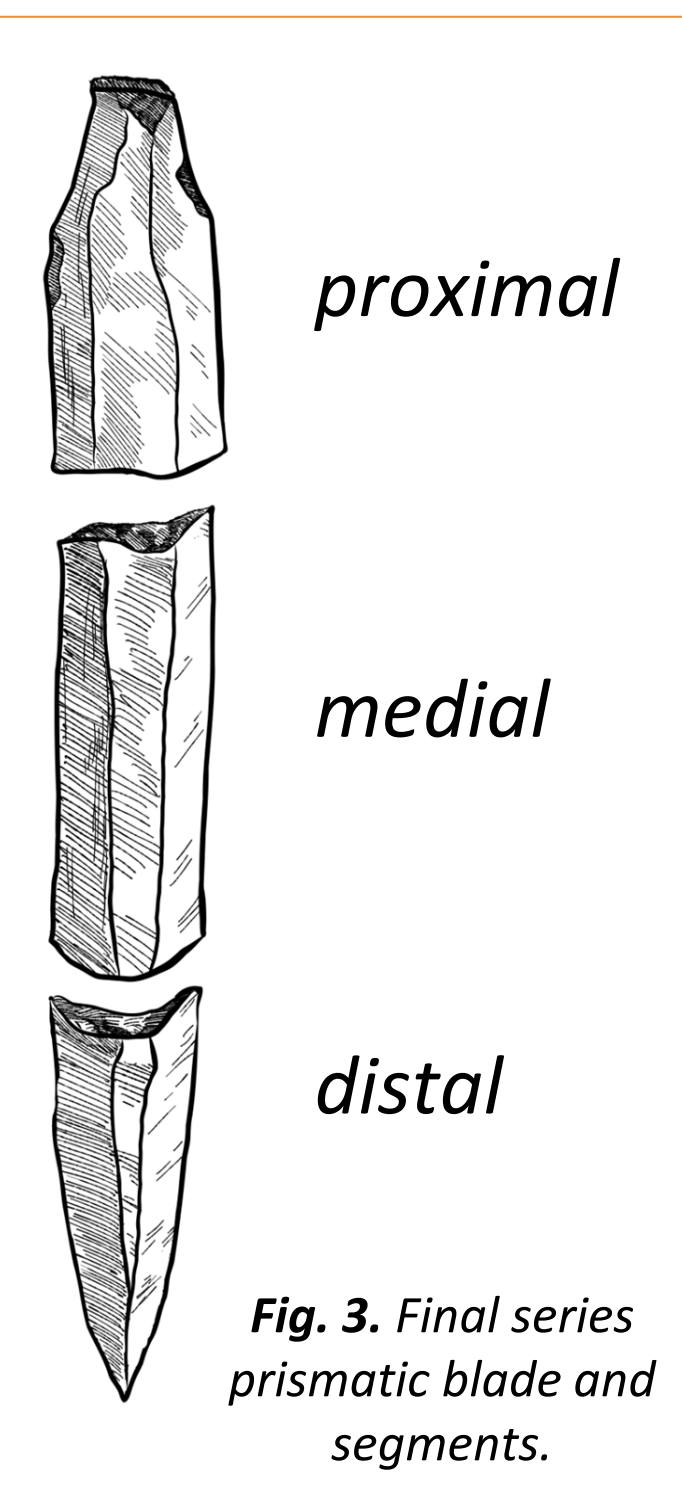
Obsidian was a key economic resource in ancient Mesoamerica, having both utilitarian and ritual significance for both commoners and elites [1]. Because obsidian prismatic blades were the “cutting edge” in Mesoamerica, their ubiquity provides key indicator of economic ties between regions and sites [2]. Through archaeological evidence and experiment, archaeologists have reconstructed the basic two-stage sequence by which blades were produced [3]. In the first stage, raw obsidian nodules would be shaped into polyhedral cores using percussion techniques. These activities of the blade reduction sequence are represented archaeologically by decoration flakes. In the second stage of blade production, initial and final series blades were removed from cores using pressure shaping techniques. The final series blades were the most regular, and hence most desirable for everyday use. While blades remained the cutting tool of choice from the Formative period through the 16th century AD, obsidian also appears in other forms including points and eccentrics.

Blade Trade Model	Prox:Dist Ratio	Med:Dist Ratio
Whole blade trade	1:02	2-3:1
Processed blade trade	6:01	6:01



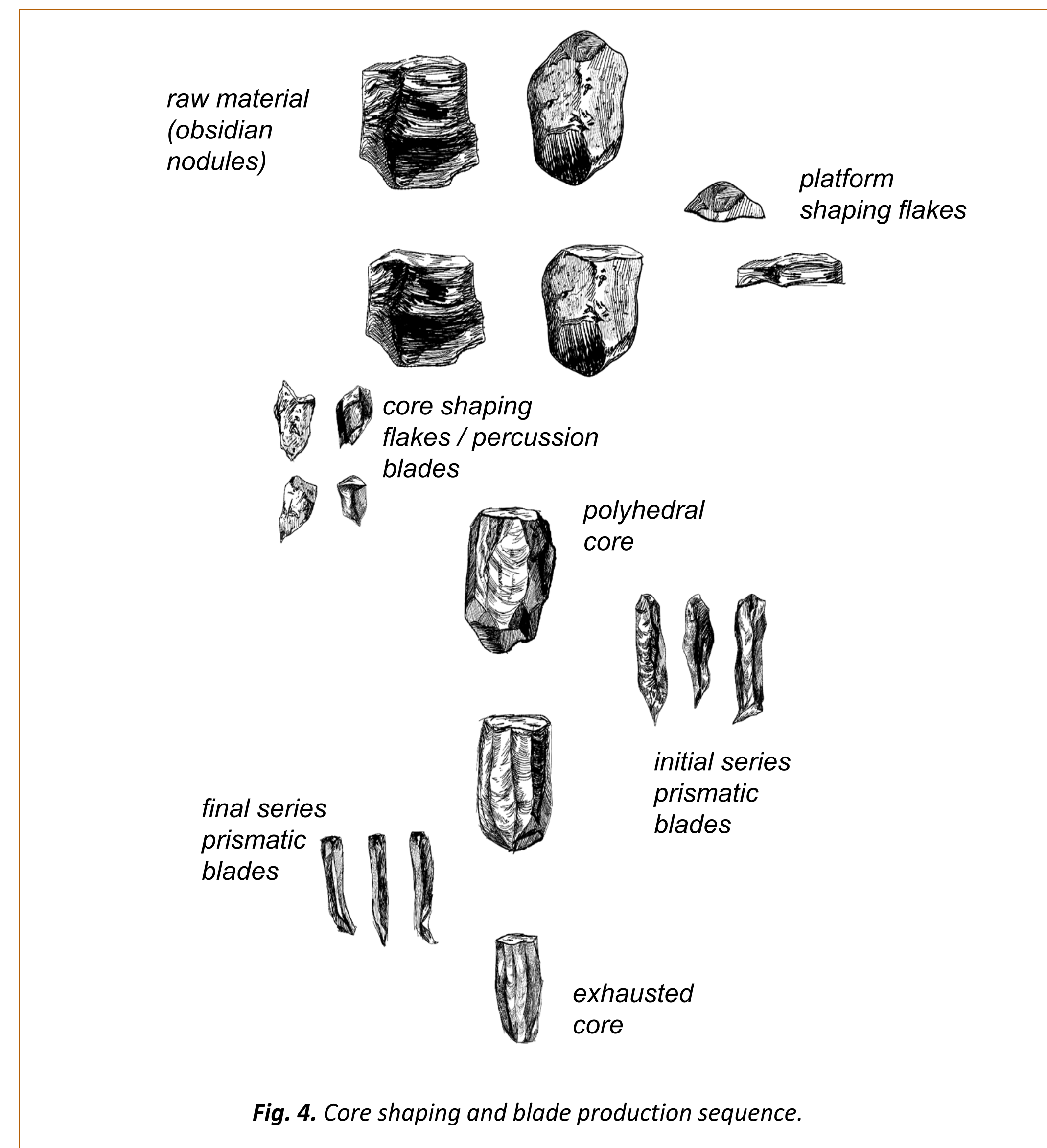
## Project Overview

Proportions of blades or blade segments present at a site can indicate the ways in which obsidian tools were exchanged and transported across the landscape [4]. De León and colleagues [4] introduced several blade trade model to assess how obsidian was circulated. If sites imported whole, finished blades (without removal of distal end), the ratio of proximal to distal segments should be 2:1, and the ratio of medial to distal should be 2-3:1. Sometimes the distal end of a blade was removed prior to the circulation of obsidian blades. In this case, the proximal to distal ratio should be 6:1 and the medial to distal ratio should be the same or higher. **This study compares proportions of different types of artifacts between sites in western Belize to patterns of exchange in western Belize.**



## Technological Analyses

Lithic technological analyses of obsidian artifacts was conducted by members of the Pitt Tropical Paleoecology and Isotope Geochemistry lab during Fall 2024 and Spring 2023. Artifacts were collected by the Belize Valley Archaeological Reconnaissance (BVAR) Project between 1988 and 2022. Artifacts were categorized based on production stage and tool type [3]. Digital calipers were used to measure the length, width, and thickness of each specimen. Each artifact was also visually inspected with the aid of magnifying lenses to document retouching. A total of 4610 obsidian artifacts have been analyzed so far from the regional centers Baking Pot, Cahal Pech, Lower Dover, Xunantunich and Caracol. Additional analyses from other sites is ongoing.



Artifact Type	Baking Pot	Caracol	Cahal Pech	Lower Dover	Xunantunich
<b>Blades</b>	1963	397	884	487	424
whole	42	1	5	8	12
proximal	646	144	226	143	142
medial	1012	203	519	259	232
distal	263	49	134	87	38
<b>Flakes</b>	50	39	89	32	19
<b>Cores</b>	10	9	4	3	7
<b>Debitage</b>	53	6	80	6	11
<b>Other</b>	10	2	8	2	5
<b>Total</b>	<b>2086</b>	<b>453</b>	<b>1065</b>	<b>540</b>	<b>466</b>

Site	Prox:Dist Ratio	Med:Dist Ratio
Baking Pot	2.5 : 1	3.8 : 1
Cahal Pech	1.7 : 1	3.9 : 1
Caracol	2.9 : 1	4.1 : 1
Lower Dover	1.6 : 1	3.0 : 1
Xunantunich	3.7 : 1	5.9 : 1



## Interpretation and Future Research

- **Final series prismatic blades compose the assemblages (between ~80-95% of assemblages).** While some blades may have been produced locally (suggested by the presence of a few exhausted blade cores and some initial series blades), it's more likely that blades were imported as finished products.
- **Some blade segments possess retouching,** indicating that they were sharpened through pressure flaking.
- **Similar proportions of proximal, medial, and distal blade segments** suggest that all western Belize sites engaged in similar economies for the exchange of obsidian tools.
- Ratios indicate a mix of whole and processed blade trade.
- Future analyses will differentiate artifacts based on temporal and contextual associations to elucidate diachronic trends in consumption between elite and non-elites.
- All artifacts will also be subject to portable x-ray fluorescence analyses (pXRF) to document to understand the distributions of different types of obsidian at the regional and local level.

## References

- [1] B.L. Stark et al., Economic Growth in Mesoamerica: Obsidian Consumption in the Coastal Lowlands. *Journal of Anthropological Archaeology* 41, 263-282 (2016).
- [2] M. Goltko et al., Complexities of Collapse: The Evidence of Maya Obsidian as Revealed by Social Network Graphical Analysis. *Antiquity* 86, 507-523 (2012).
- [3] K. Hirth, B. Andrews, in *Pathways to Prismatic Blades: A Study in Mesoamerican Obsidian Core-Blade Technology*, K. Hirth, B. Andrews, Eds. (Cotsen Institute of Archaeology at UCLA, 2002), pp. 1-14.
- [4] J.P. De León et al., Exploring Formative Period Obsidian Blade Trade: Three Distribution Models, *Ancient Mesoamerica* 20, 113-128 (2009).

## Acknowledgements

Samples analyzed are curated by the Belize Valley Archaeological Reconnaissance (BVAR) Project. We thank project directors (Awe, Hoggarth, Ebert), staff, and local field assistants & field school students. We also thank Dr. Melissa Badillo and the Belize Institute of Archaeology (NICH) for support of BVAR Project research. Rachel Horowitz (Washington State University) provided valuable knowledge and assistance with how to conduct technological analyses. All original artwork was provided by Jia Tucker (2023). Thank you also to the Pitt Center for Comparative Archaeology, which provided funding for a GSA position for Suarez to facilitate this research.