Neutron Activation Analysis of Lithic Sources in the Middle Atlantic

Past Projects, Present State, and Future Prospects

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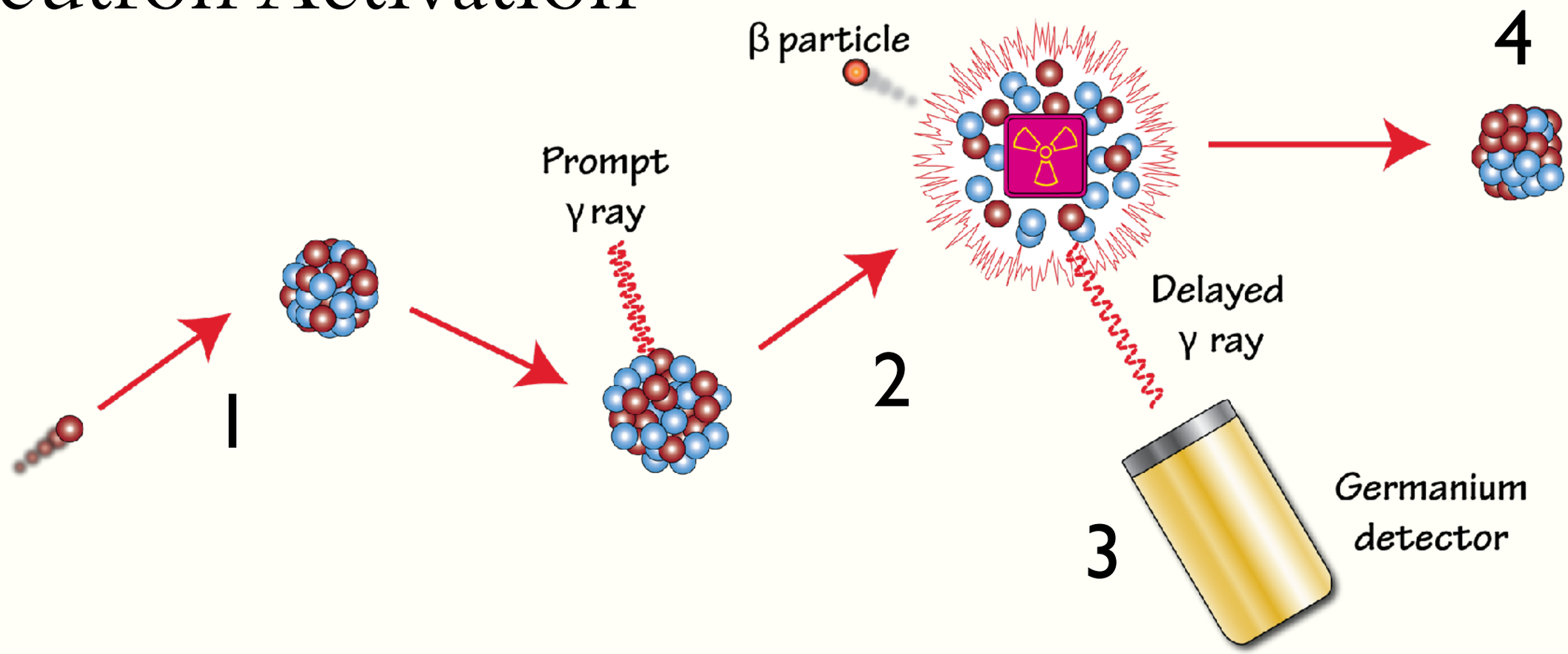
https://tinyurl.com/y9eo379l

Neutron Activation



1. Bombardment of a whole specimen with neutrons
2. Specimen becomes radioactive, and begins to emit gamma radiation
3. Gamma rays are measured and used to quantify elements
4. Specimen eventually decays back to stability

- Barbara Luedtke (1976)
  - 16 elements, n = 44 (and 21 artifacts)
  - Vera Cruz (n = 16), “All PA jasper” (n = 28)

- Patricia Miller (1982)
  - 8 elements, n = 132
  - Reading Prong, Houserville, Flint Run, Iron Hill
- Gregory Bondary (2002)
  - 12 elements, n = 315
  - Metarhyolite and jasper

Luedtke, B.

1992. An Archaeologists’ Guide to Chert and Flint. Cotsen Institute for Archaeology, UCLA.

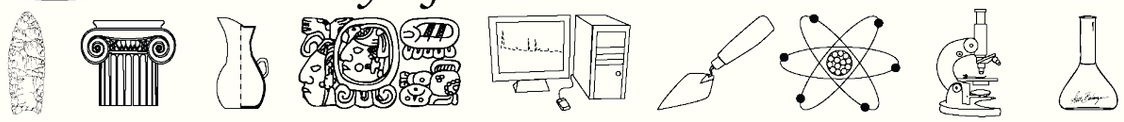
1987. The Pennsylvania connection: Jasper at Massachusetts sites. Bulletin of the Massachusetts Archaeological Society 48(2): 37–47.

Bondar, G.K.

2005. Assignment by neutron activation analysis of fifteen artifacts from the Mount Aetna site in Maryland. In: Phase I Archeological Survey of the Maryland Route 66 and Mt. Aetna Road Roundabout and Phase II Evaluation and Phase III Data Recovery Investigations at Site 18WA487, Washington County, Maryland, W. Lowthert, A. Fehr, A. Markell, and M. Williams. State Highway Administration Archeological Report No. 231. R. Christopher Goodwin and Associates.

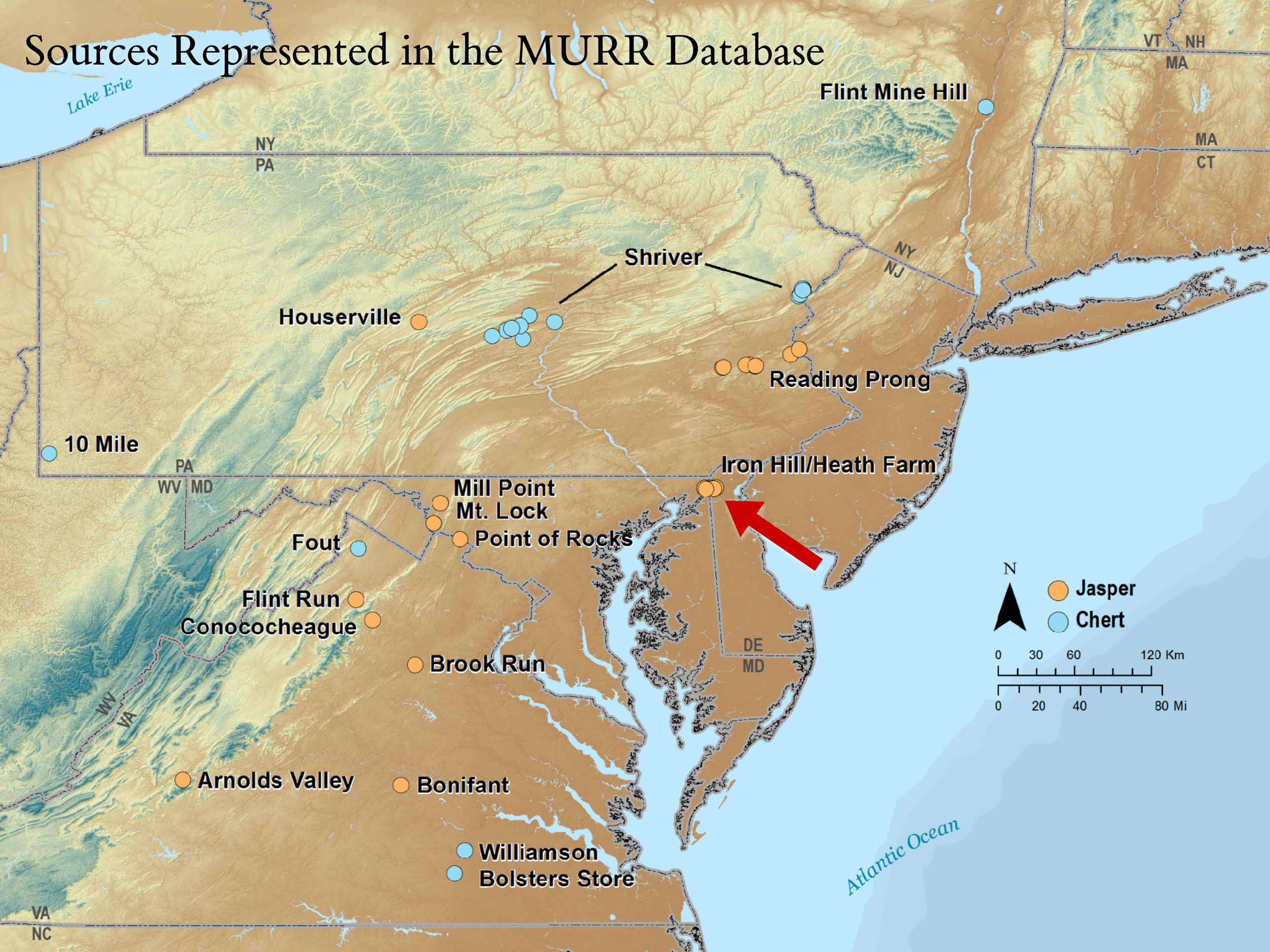
Miller, P.S.

1982. Prehistoric lithic procurement: a chemical analysis of eastern U.S. jasper sources and a consideration of archaeological research design. Unpublished M.A. thesis, Department of Anthropology, Pennsylvania State University.



- Maryland
  - Iron Hill, Heath Farm (C. Stevenson)
- Ohio
  - Upper Mercer, Flint Ridge (B. Chiarulli)
- Pennsylvania
  - Bedford, Loyalhanna, Onondaga (till), Ten Mile, Uniontown, Penns Creek (B. Chiarulli)
  - Houserville, Reading Prong (C. Stevenson)
  - Oriskany, Helderberg, Buttermilk Falls (GRA)
  - Mahantango, Shriver (KCI)
  - Shriver (AD Marble)
- Virginia
  - Williamson, Bolsters Store, Mitchell Plantation, Bonifant, Flint Run, Rockbridge, Virginia Beach (C. Stevenson)
  - Brook Run (Louis Berger Group)
- West Virginia
  - Kanawha, Brush Creek (B. Chiarulli)
  - Kanawha (S & ME)

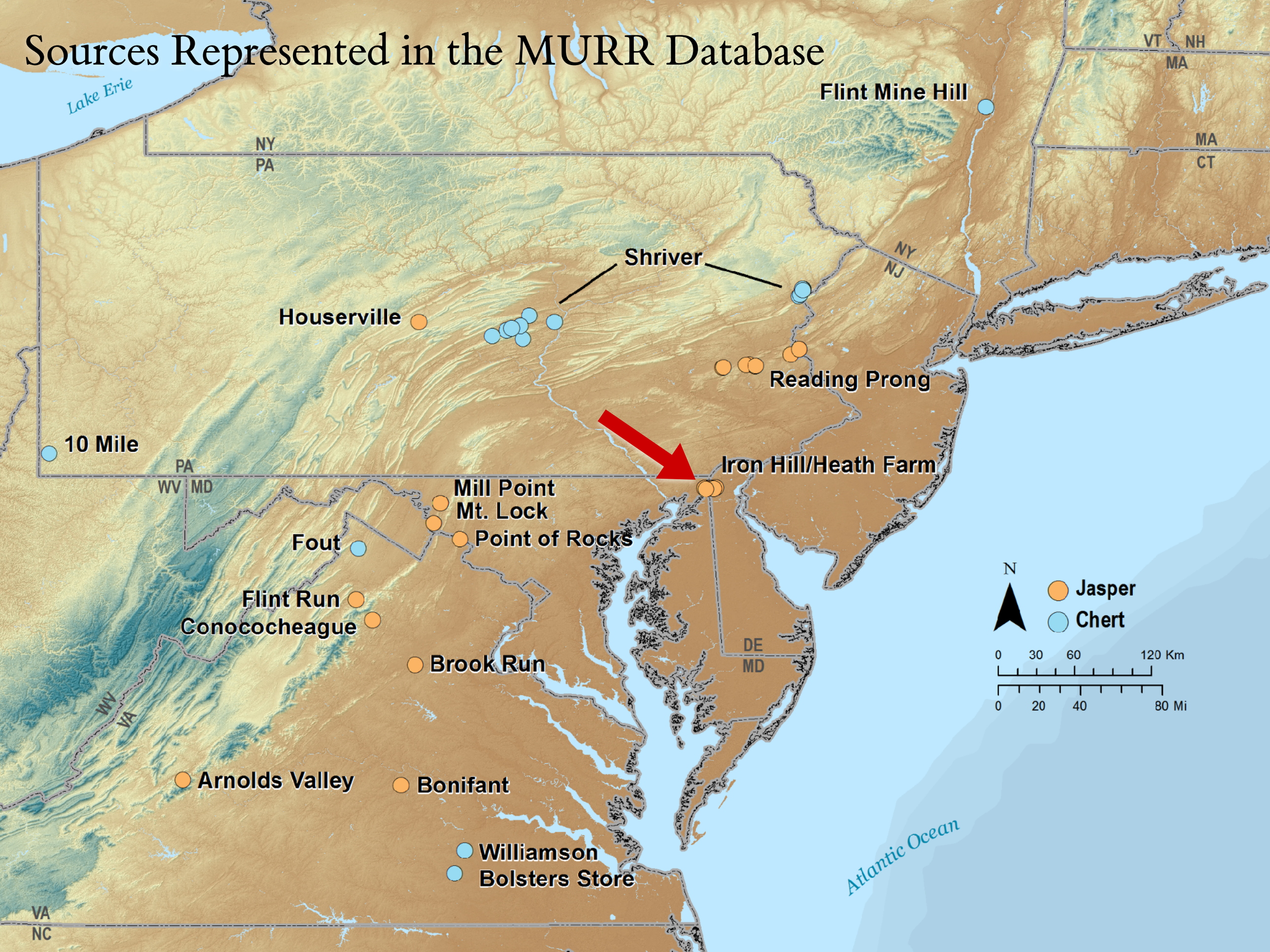
Sources Represented in the MURR Database



Iron Hill (7NC-D-34)

Iron Hill (7NC-D-34)

Sources Represented in the MURR Database



Heath Farm (18Ce8)

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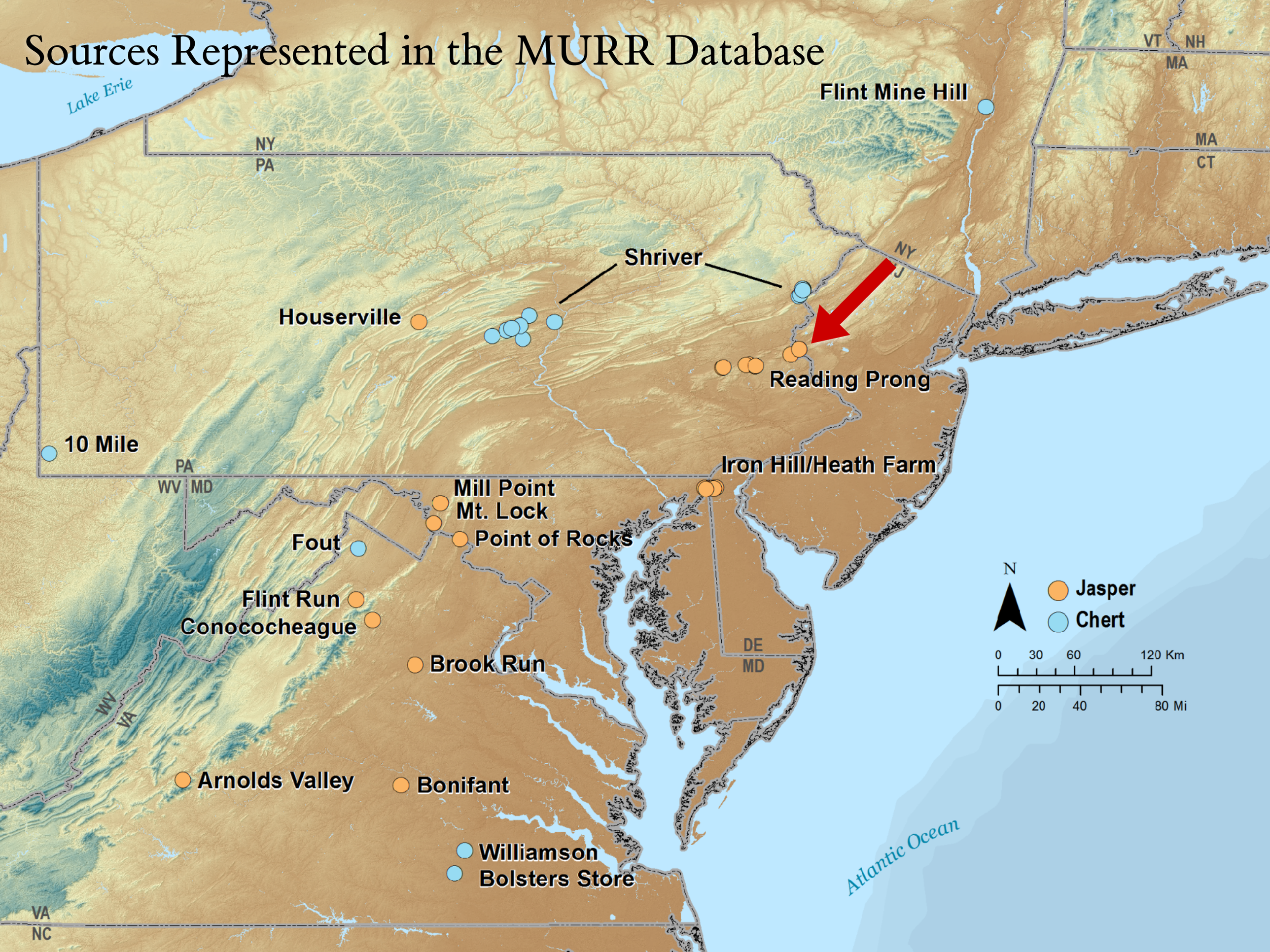
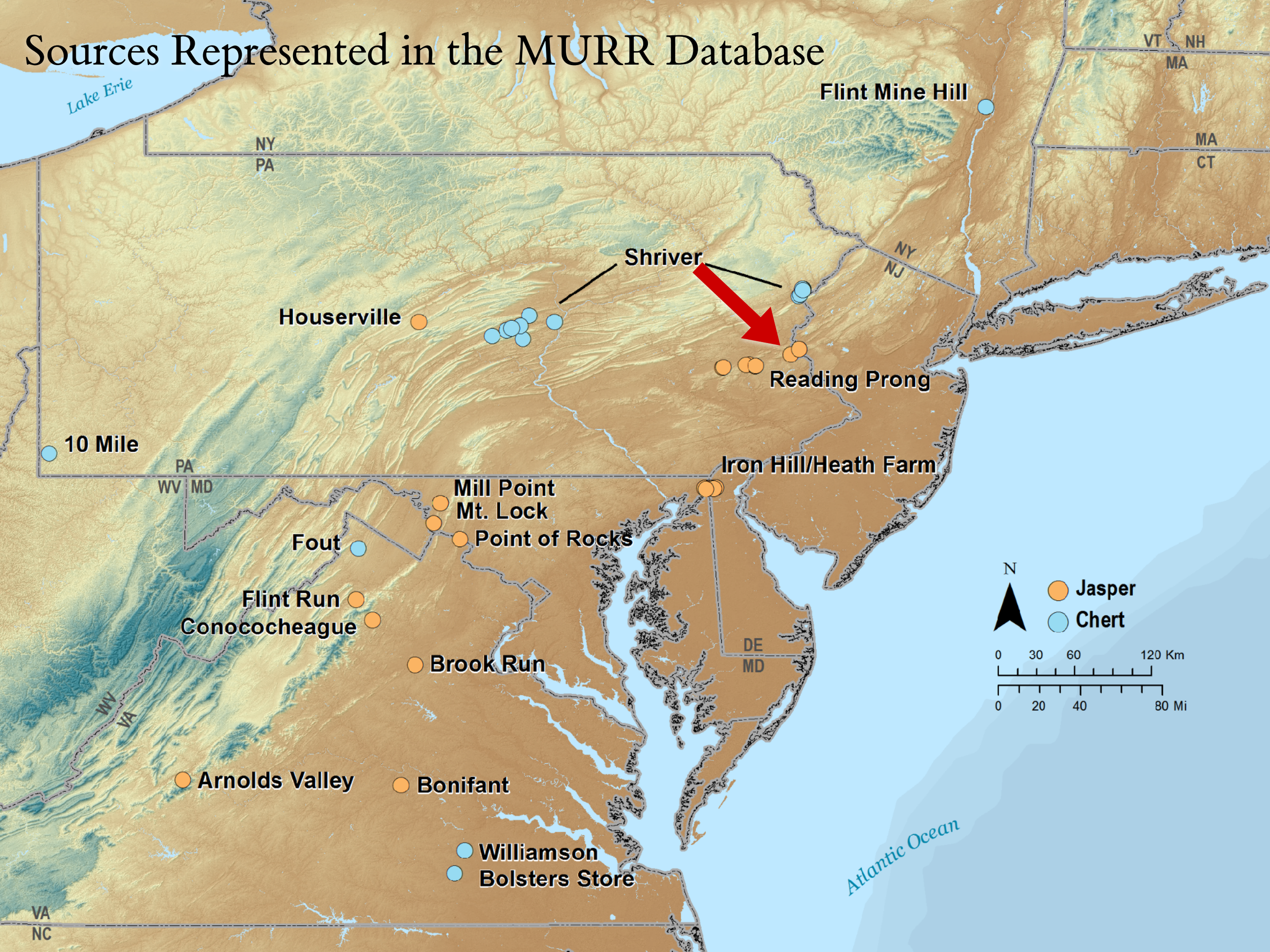


Gilbert 1 (28Hu575)

Sources Represented in the MURR Database



Kings Quarry (36Lh2)

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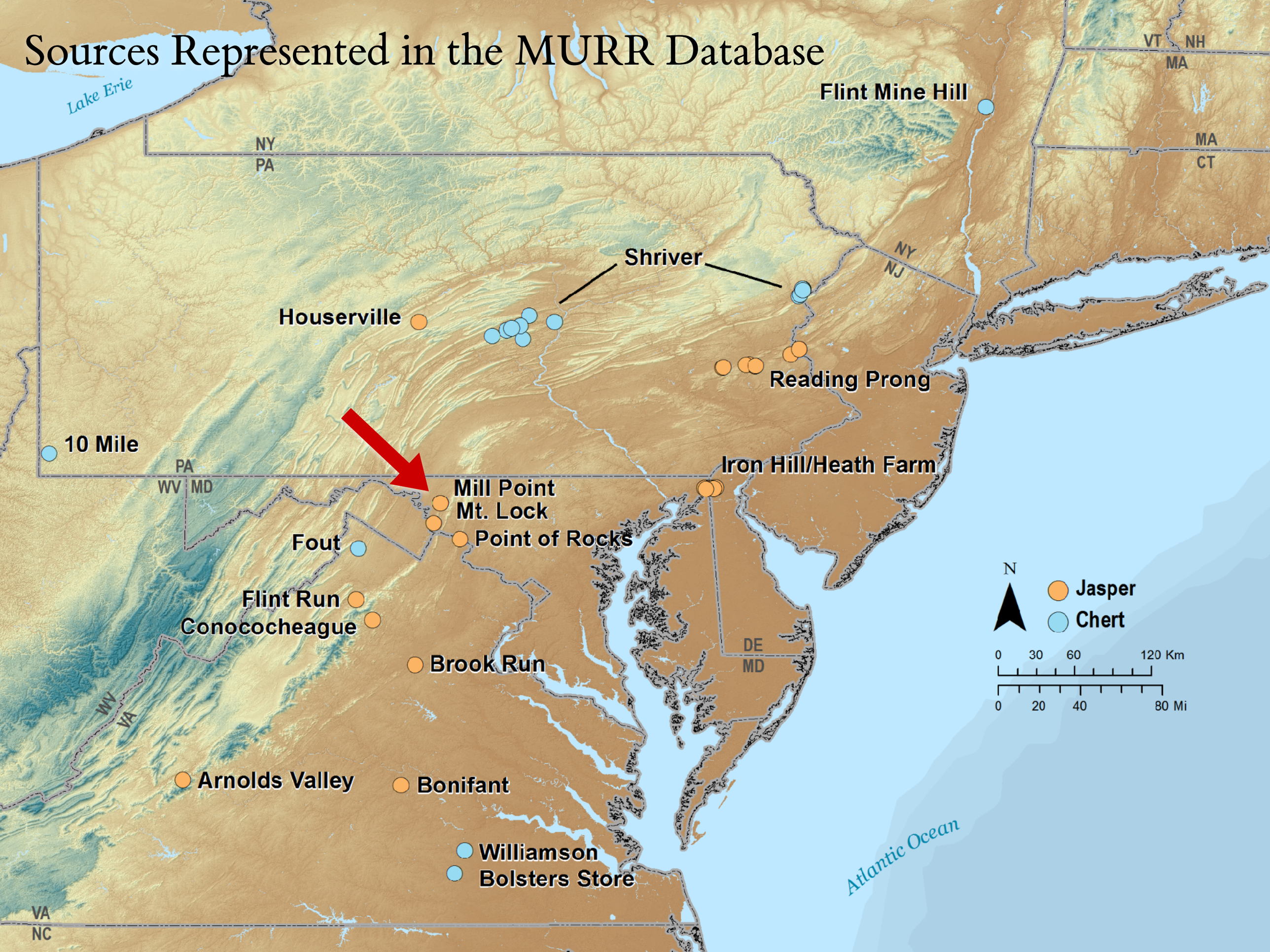
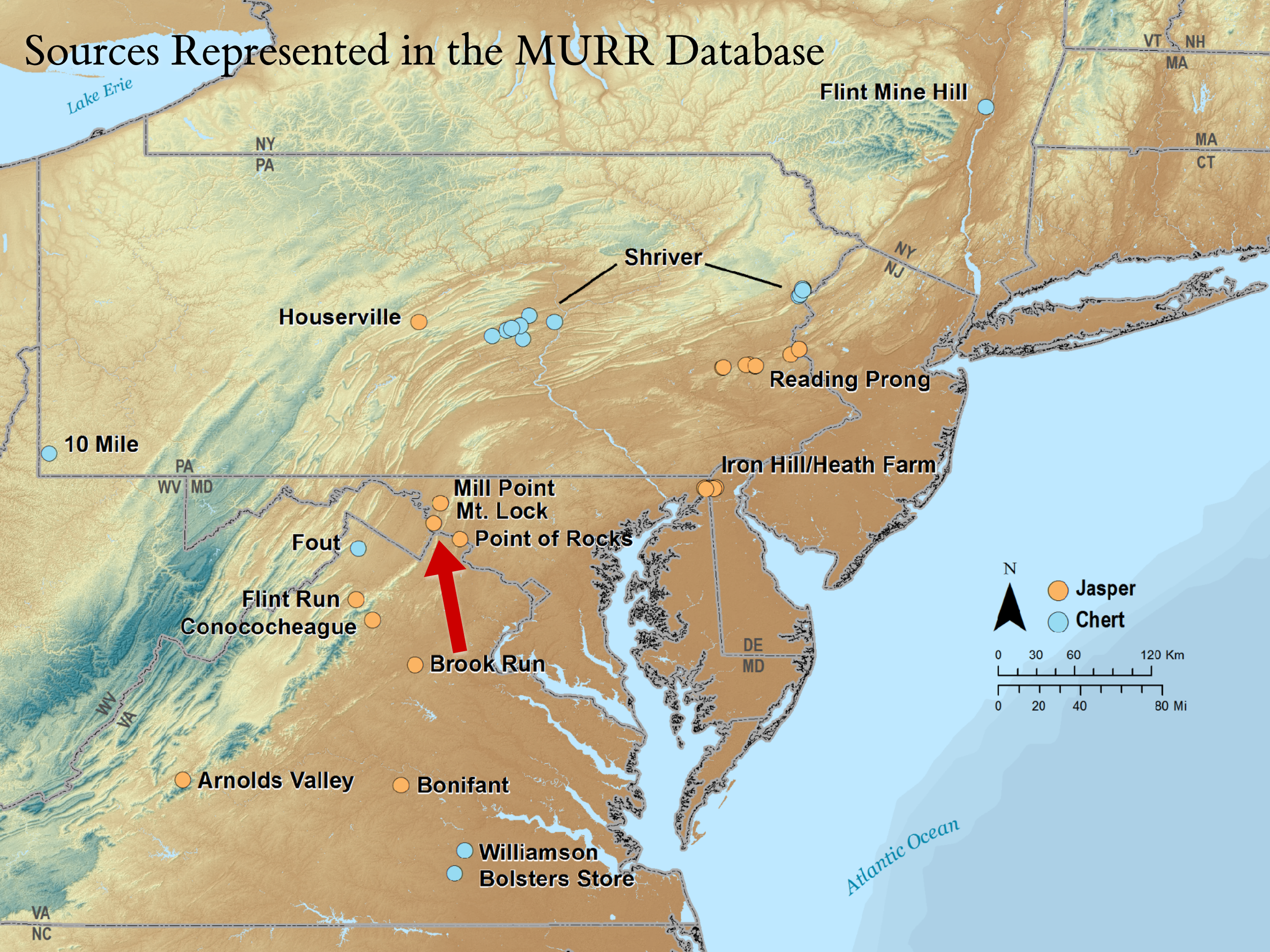
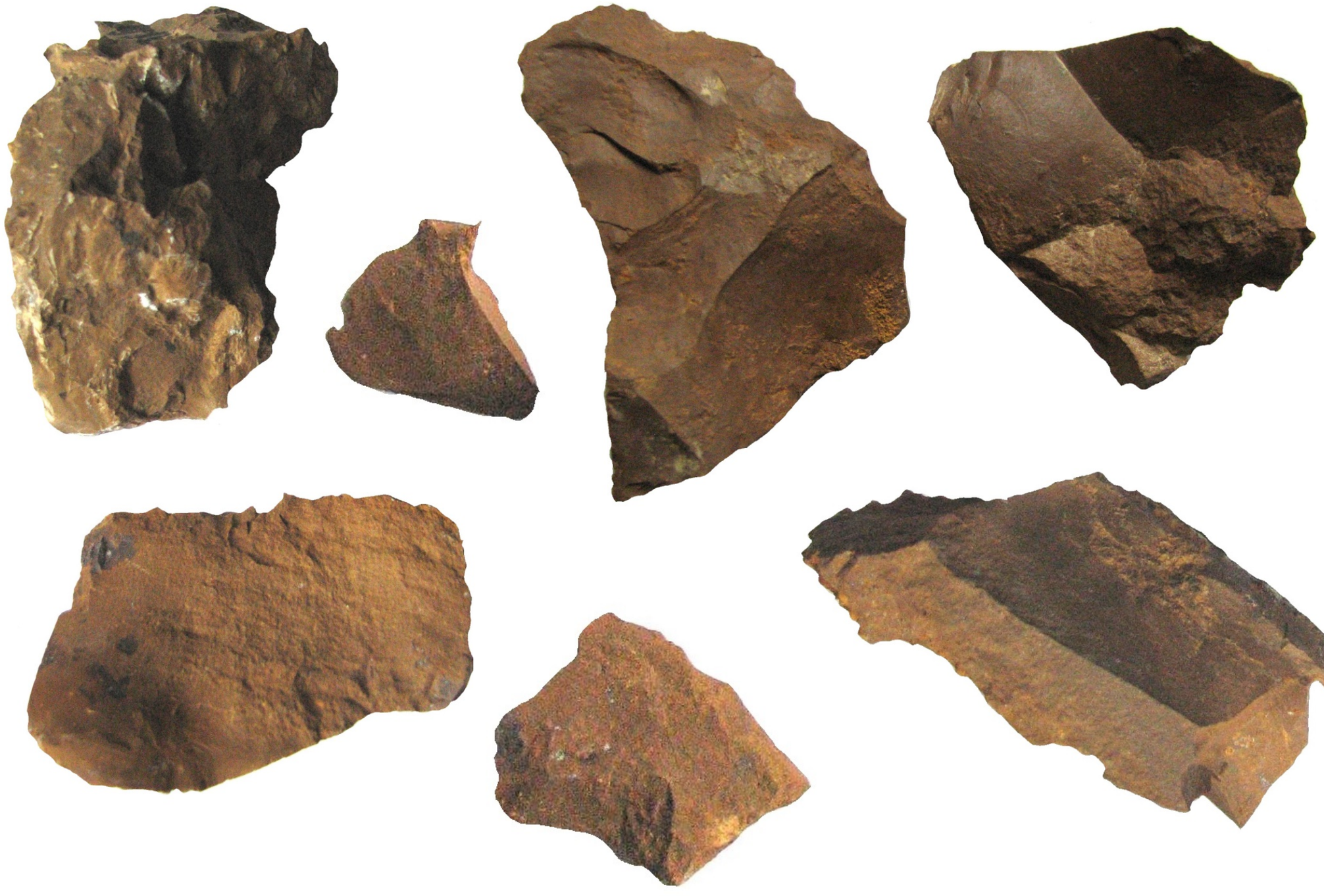


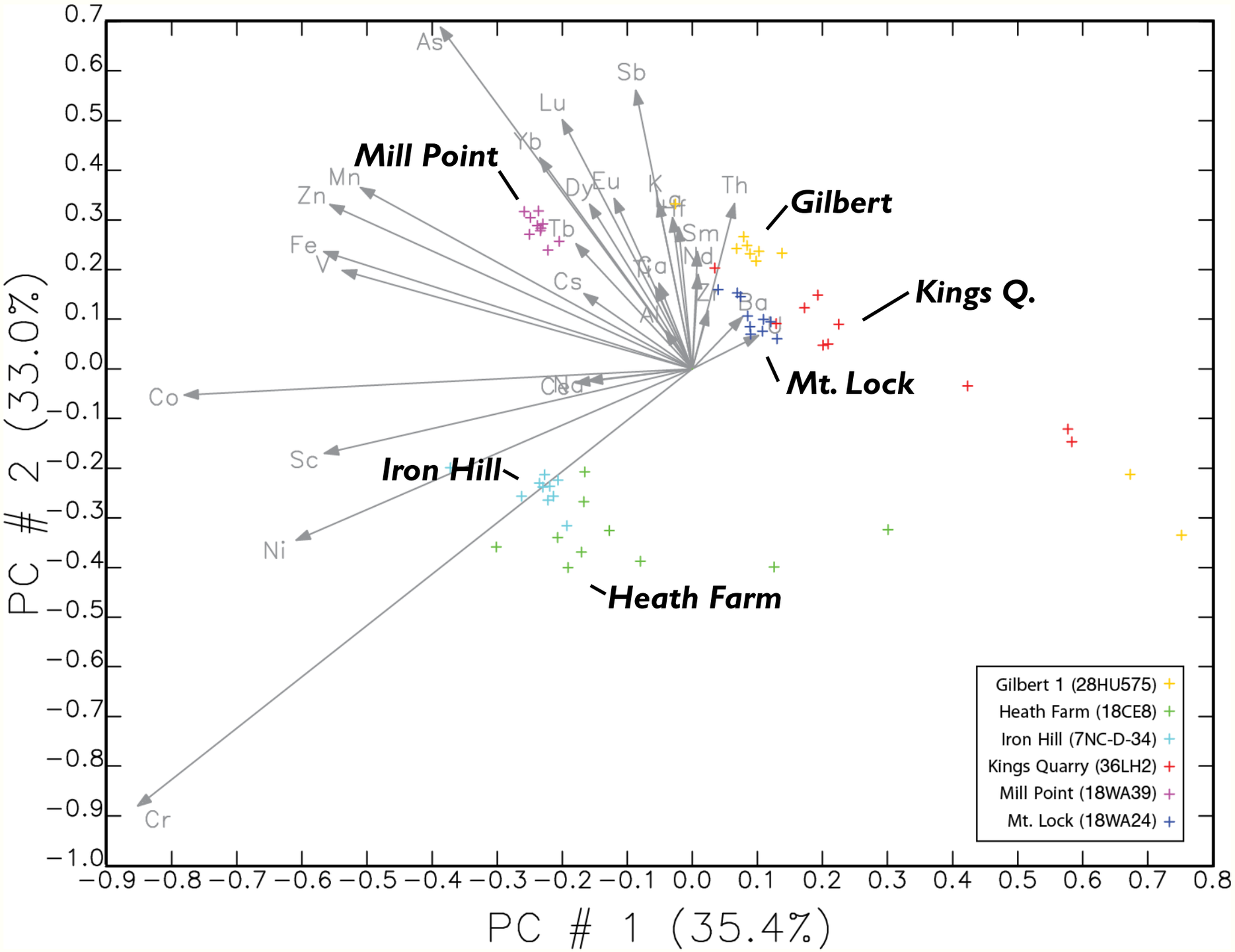
Mill Point (18Wa39)

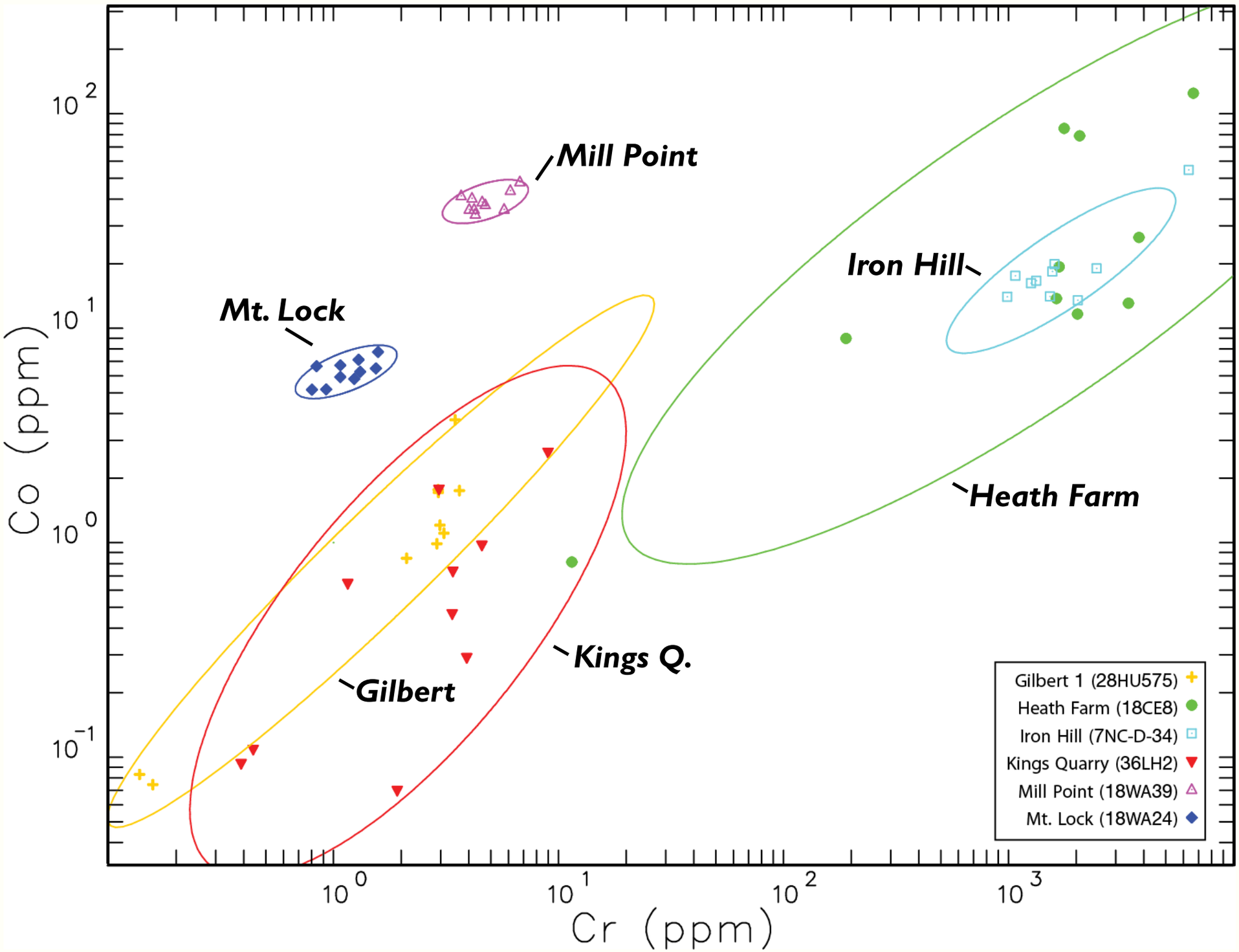
Sources Represented in the MURR Database



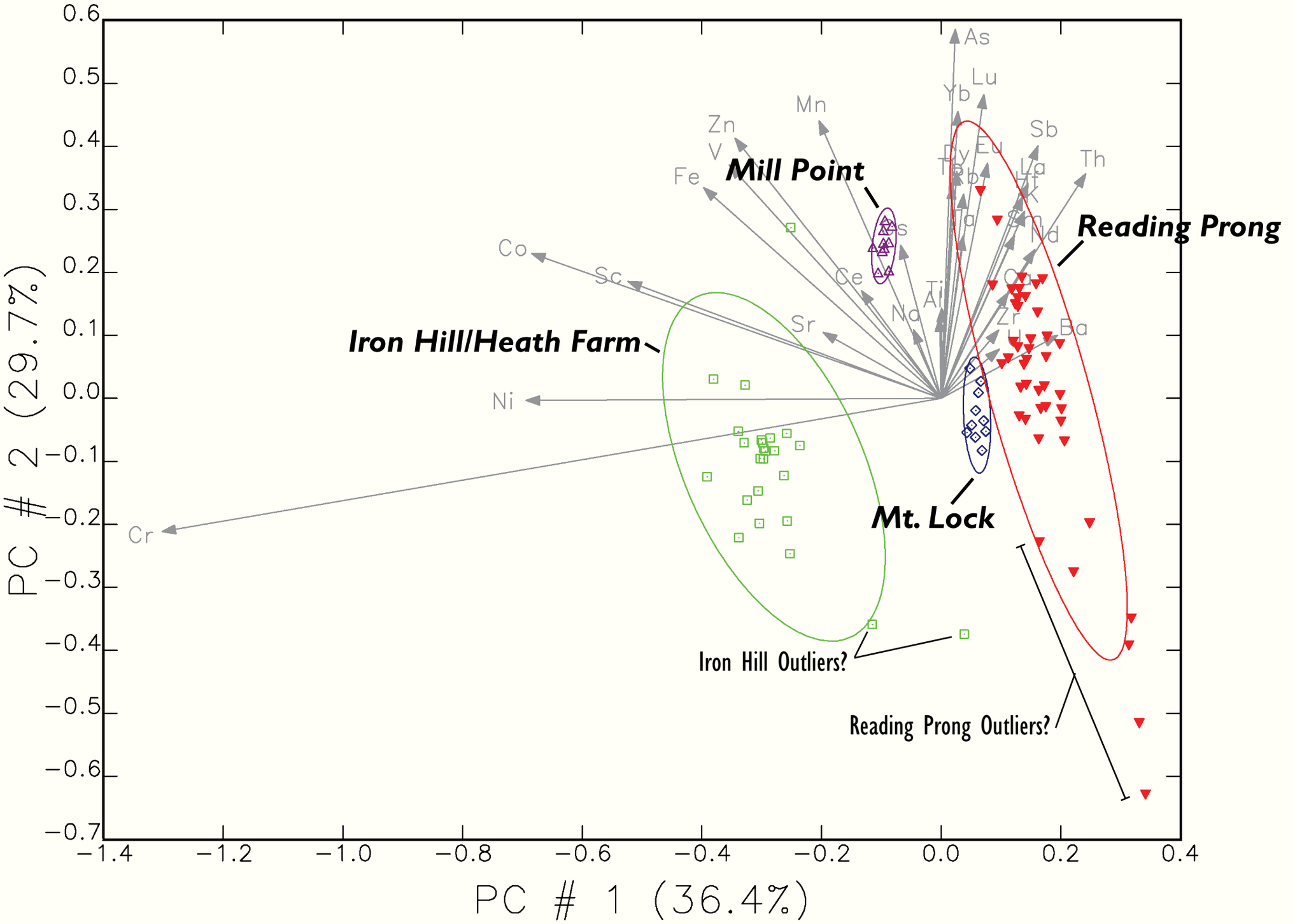
Mt. Lock/Dargan (18Wa24)



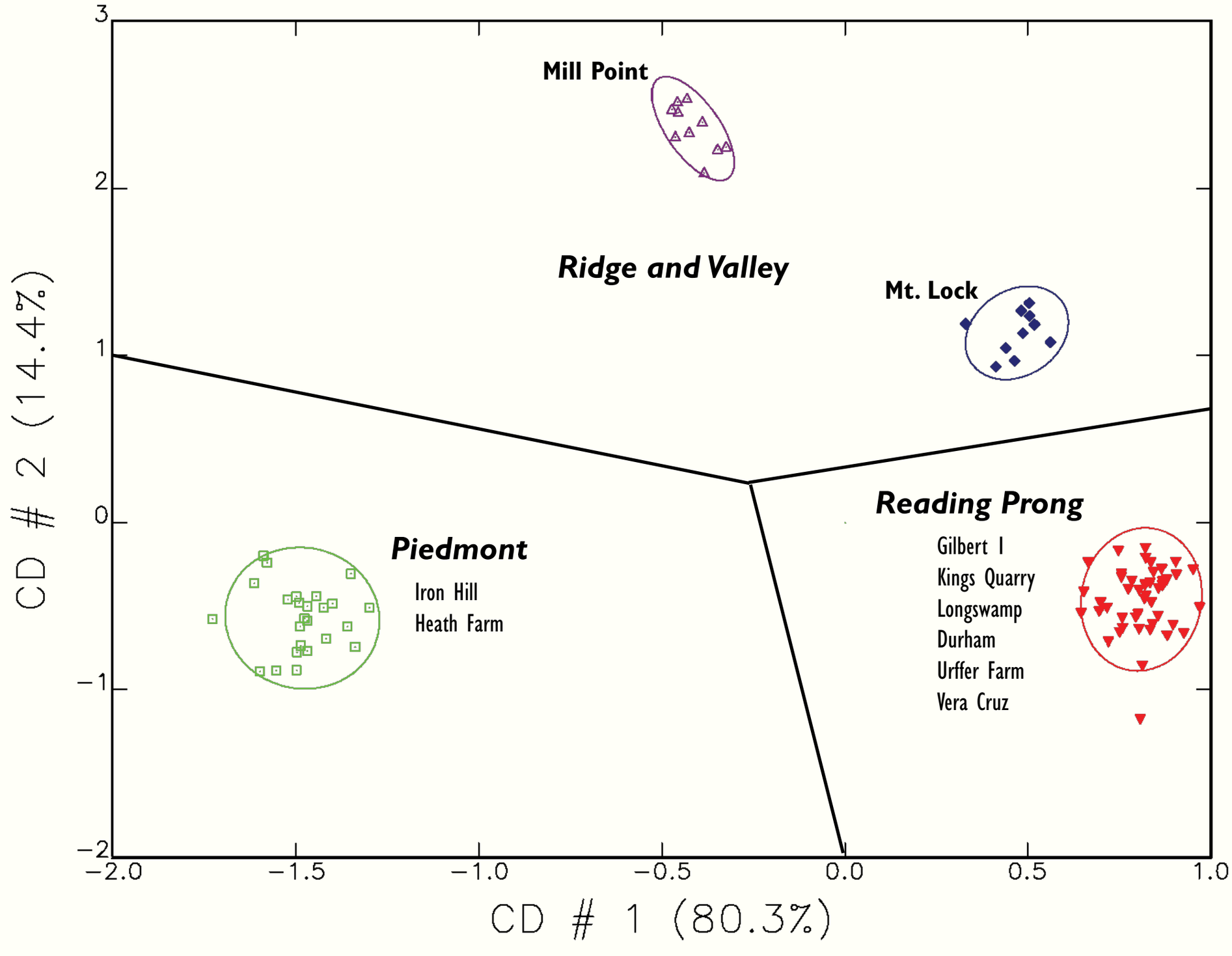

As
Sb
Lu
Yb
Mill Point
Mn
Zn
Dy
Eu
K
La
Th
Gilbert
Tb
Sm
Fe
V
Nd
Ca
Cs
Ba
Kings Q.
Al
Mt. Lock
Co
Sc
Iron Hill
Ni
Heath Farm
Cr
Gilbert 1 (28HU575)
Heath Farm (18CE8)
Iron Hill (7NC-D-34)
Kings Quarry (36LH2)
Mill Point (18WA39)
Mt. Lock (18WA24)
PC # 2 (33.0%)
PC # 1 (35.4%)



Ellipses drawn at 90% confidence interval



Ellipses drawn at 90% confidence interval



Ellipses drawn at 90% confidence interval

Future Prospects…

Summary statistics are not enough

- Publish or digitally distribute raw data for individual specimens

Focus on establishing reliable source profiles

- No need to analyze artifacts until we know that the sources are distinct

Use formal geological terminology and nomenclature

- Avoid using colloquial names or chert "types," these may obscure relationships among disparate projects