U.S. Department of the Interior
Bureau of Land Management

Arizona

District Archaeology Technician Program

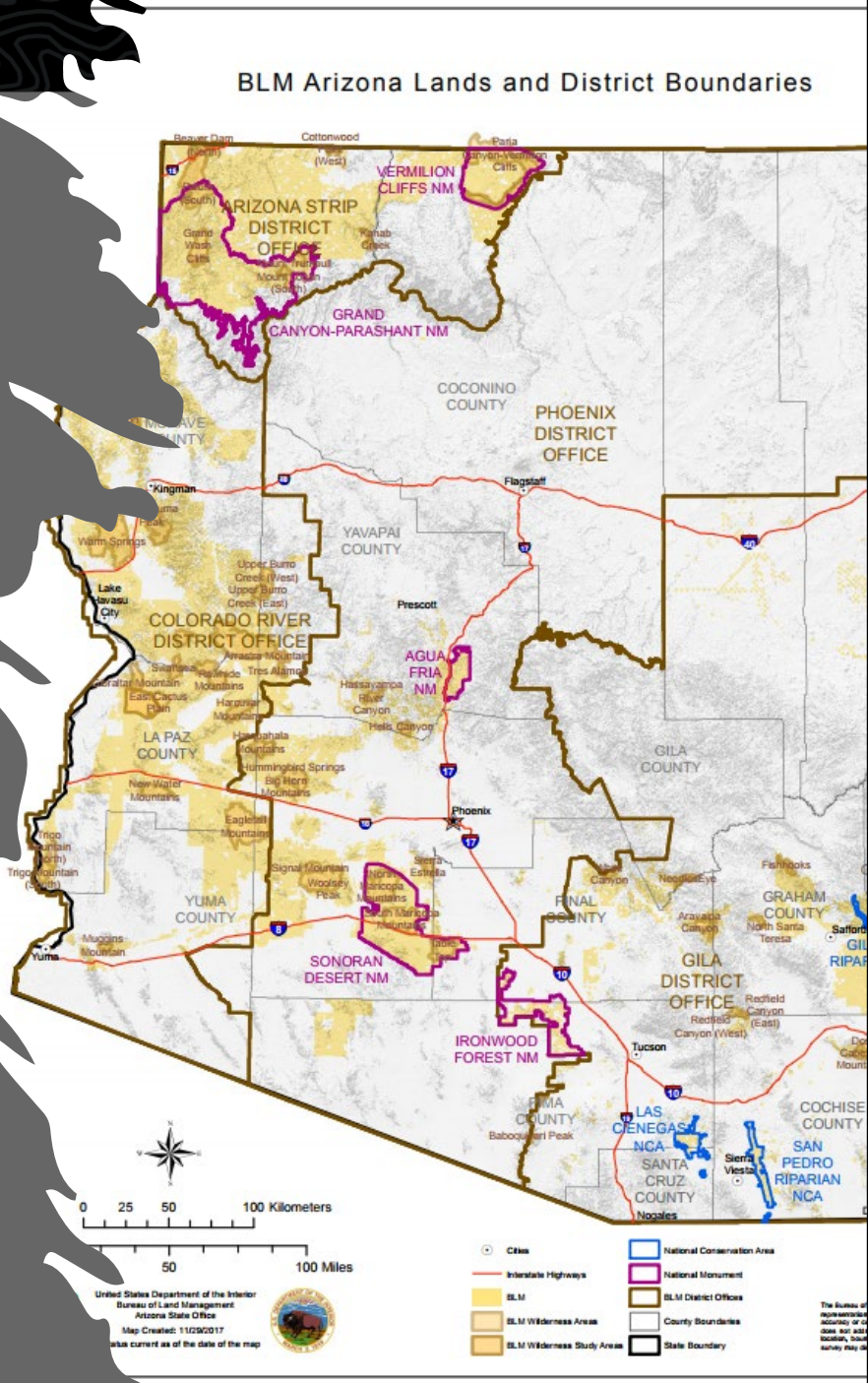
Archaeology and Cultural Resource Management Training

Cultural Heritage Program

- The BLM Cultural Heritage Program provides for the BLM's management of cultural and paleontological resources in accordance with Section 110 of the National Historic Preservation Act (NHPA) and other authorities.
- As of October 2021, 16,755 archaeological sites are currently recorded in GIS, two are National Historic Landmarks, 21 are listed on the National Register of Historic Places, and 18 are interpreted and developed for the public.
- Section 106 of the NHPA requires the BLM to take into account the effects of an undertaking on historic properties.

District Archaeology Technician Program

- To assist District and Field Office Cultural Specialists in implementing the BLM Cultural Heritage Program
- To provide added field capacity in the identification of archaeological resources
- Perform small inventories, record small sites, and write reports of inventories
- Use of DATs subject to approval by the local Cultural Specialist



DATs Observe & Report

- DATs are not professional archaeologists
- DATs do not evaluate National Register significance
- DATs do not assess effects
- DATs do not collect or perform mitigation
- DATs do not survey in areas of high site density
- DATs do not record large or complex sites

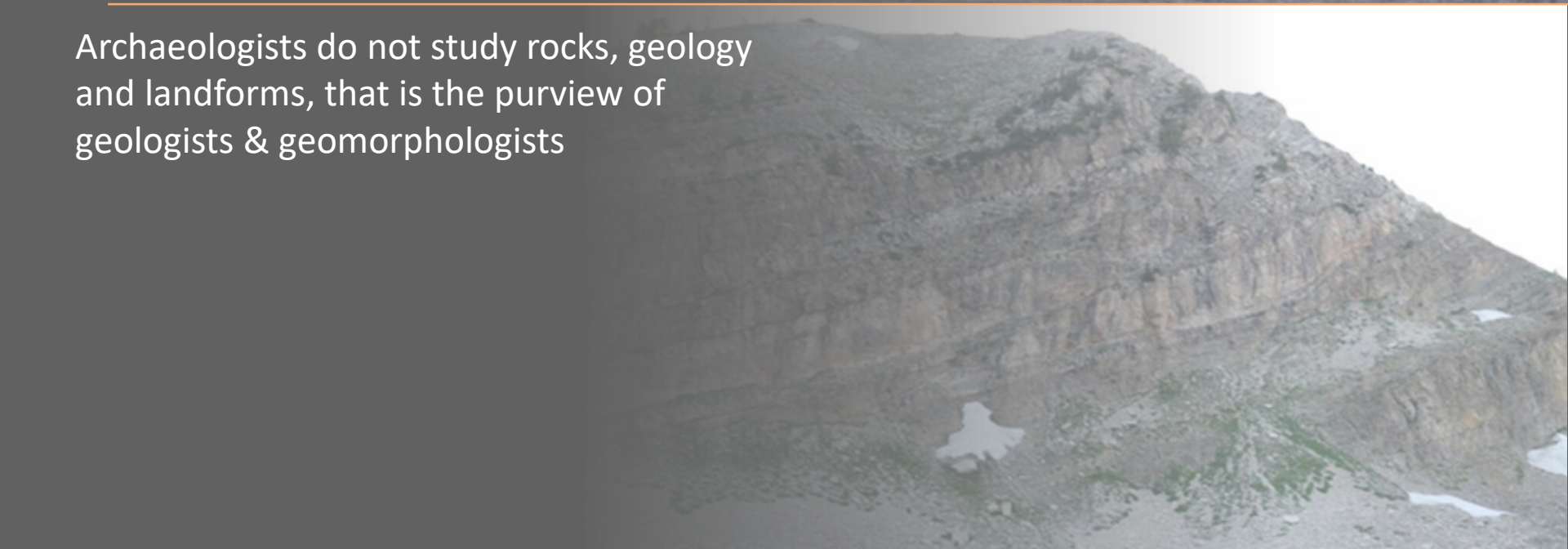
What is archaeology?

What archaeology is not:

Paleontologists, not archaeologists, study fossils and dinosaurs

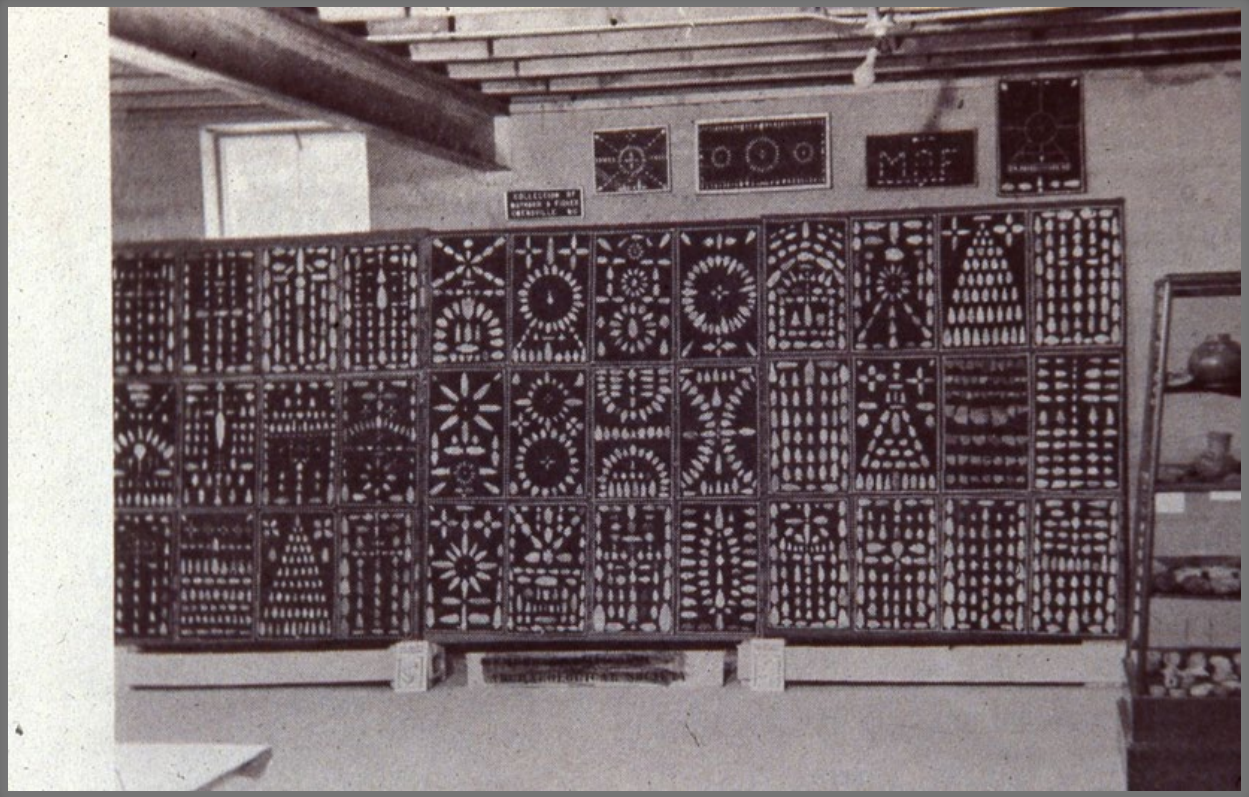
What archaeology is not:

Archaeologists do not study rocks, geology and landforms, that is the purview of geologists & geomorphologists



What archaeology is not:

Archaeology is not the collection of artifacts for personal enjoyment, monetary gain or to fill museums.



What archaeology is not:

Wanton destruction of archaeological sites to “harvest” arrowheads, bottles, coins or other “finds” is not archaeology.

That is looting. And is illegal. Even federal employees can be charged with violations of cultural resources laws.

RESPECT AND PROTECT™

RESPECT AND PROTECT

LOOK, DONT LOOT

It is illegal to take arrowheads, pottery pieces, and other cultural artifacts from America's public lands. Help us respect and protect America's heritage by leaving these artifacts where you find them and reporting looting.

RESPECT AND PROTECT

This Public Service Announcement powered by:

tread lightly! ON LAND AND WATER

602 417 9200
LOOTING and VANDALISM
REPORT

Keep Our Heritage Intact For Future Generations

DON'T BREAK TRADITIONS

602 417 9200
LOOTING and VANDALISM
REPORT

This Public Service Announcement powered by:

tread lightly! ON LAND AND WATER

What is Archaeology?

Archaeology is the scientific study of past cultures through analysis of material remains. In the U.S., archaeology is a subfield of anthropology.

Material Remains:

- **Artifacts**
- **Architecture**
- **Biofacts or ecofacts**
- **Landscapes**

Archaeology helps us understand our past more thoroughly.

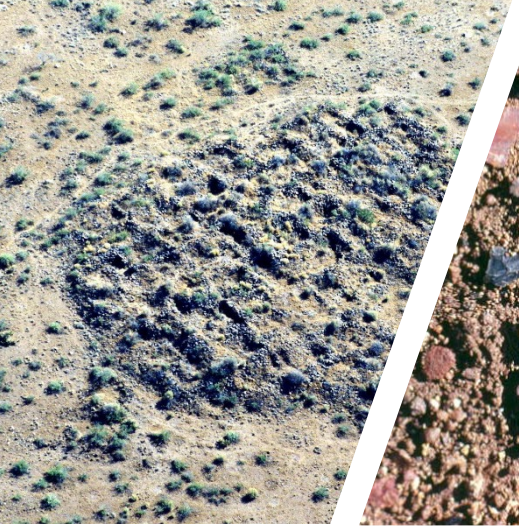
Written history is often focused on the opinions and experiences of the person writing or creating the documents. Since most writers in the past were affluent white males, historic documents typically reflect their view of the world. Knowingly or unknowingly.

Archaeology allows for others to be included in the understanding we have of the past.

- Fieldwork
- Research
- Writing
- Illustration
- Photography
- Computer analysis
- Artifact and ecofact analysis
- Scientific inquiry
- Statistical analysis
- Regulatory compliance

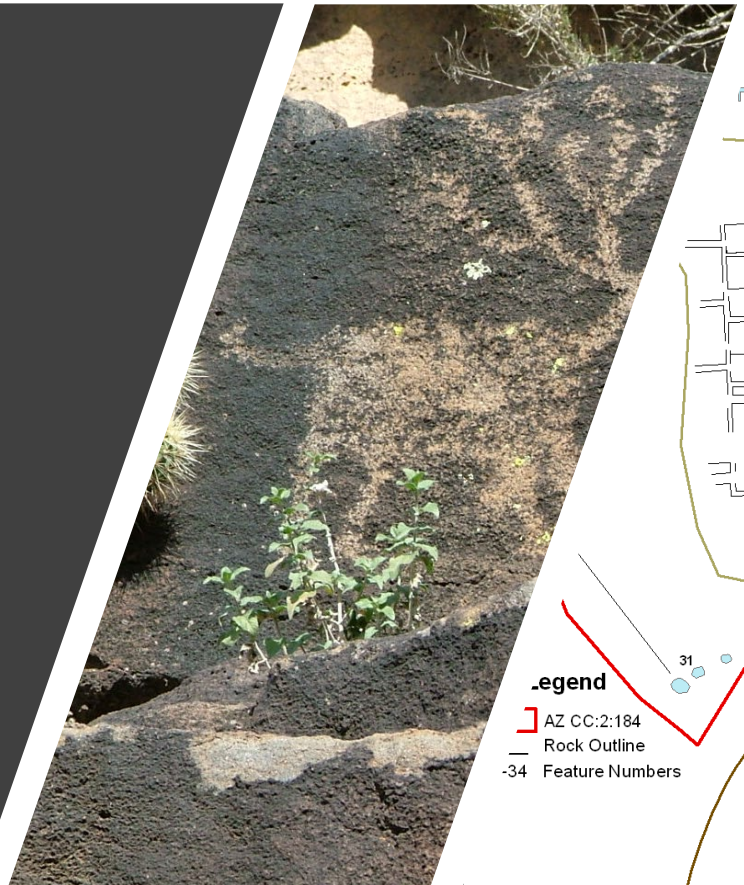
What is Archaeology?

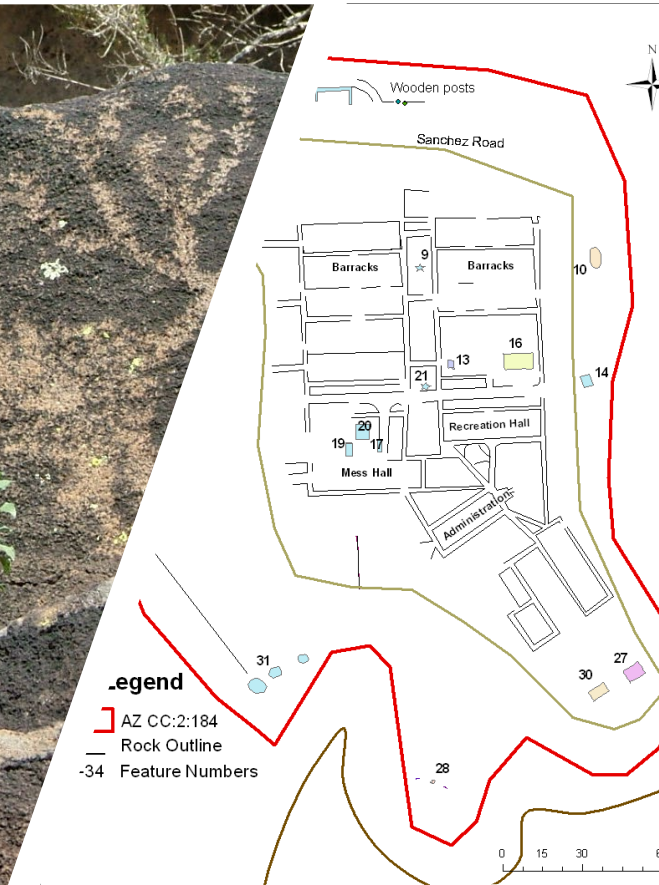
Survey and excavation are only a small part of what an archaeologist does.



What is an archaeological site?

- An archaeological site is a discrete location on the Earth where some sort of human activity took place, and the material remains of that activity are preserved.



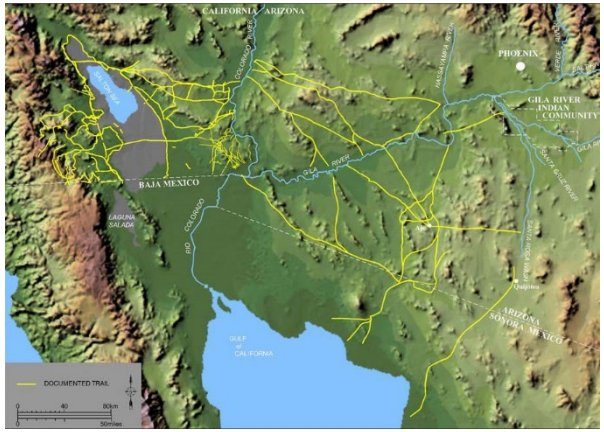


Artifact Scatters

Rock Circles/Alignments

Standing Walls/Architecture

Intaglios/Cleared Circles


CALIFORNIA ARIZONA
PHOENIX
GILA RIVER INDIAN COMMUNITY
BAJA MEXICO
LAGUNA SALADA
RIO COLORADO
GULF OF CALIFORNIA
ARIZONA SONORA MEXICO
DOCUMENTED TRAIL

Trails

Petroglyphs

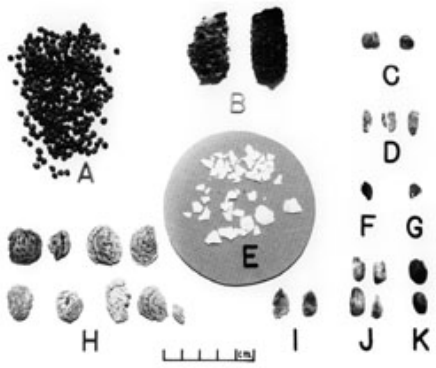
Historic Buildings/Structures

What is an artifact?

Any object made, modified, or used by a human.

What are Features?

Non-portable cultural components (e.g., hearths, wells).



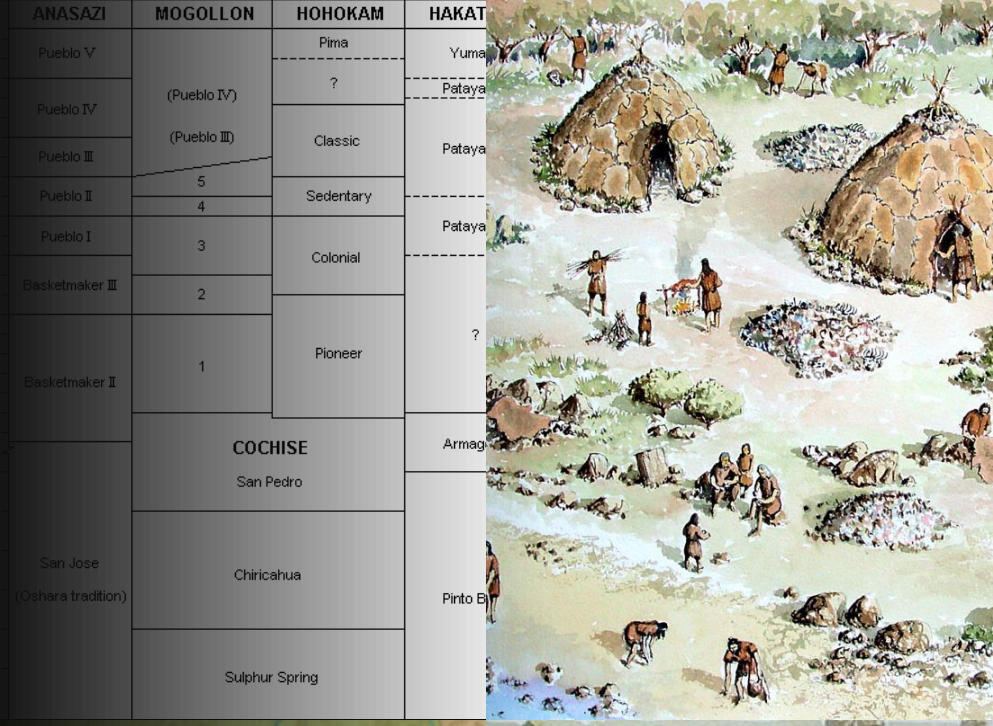
Non-artifactual objects that have not been technologically altered by humans but have relevance for archaeological research, such as shell, seeds, pollen, animal bone, pollen, insects, packrat middens, charcoal, etc.

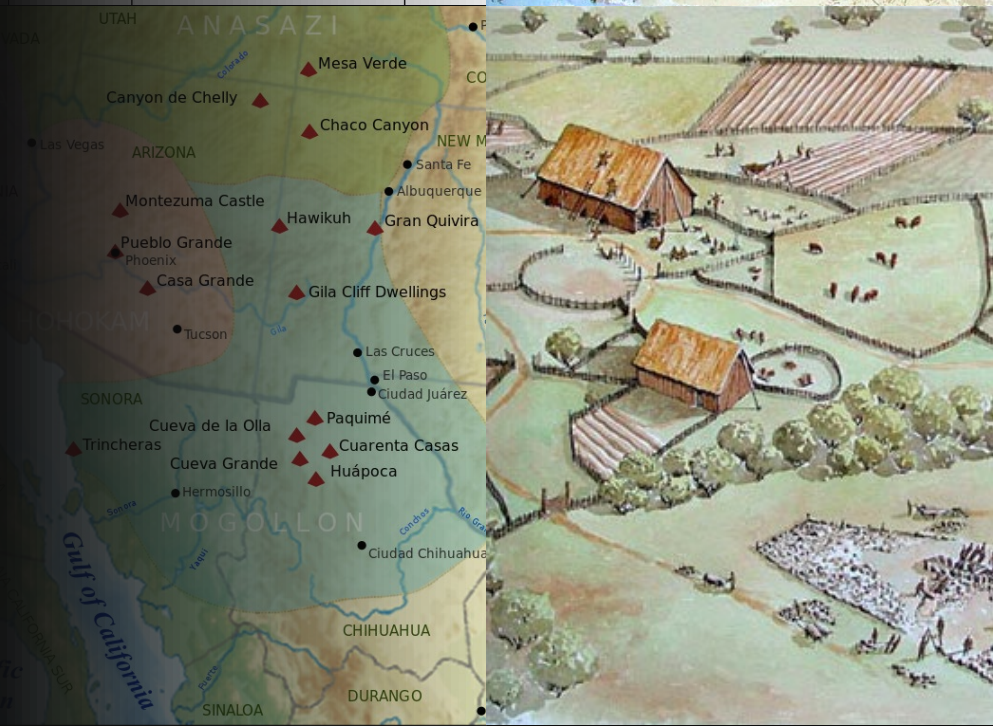
What are ecofacts?

Goals of Archaeology

The goals of archaeology are limitless. But some of the common goals are:

- Reconstruct past lifeways and behaviors
- Establish chronologies
- Establish how humans interacted with their natural environments
- Determine why and how cultures have adapted and changed over time





Historic Contexts

- Artifacts, features, and ecofacts are integral to an archaeologists' understanding of historic context.
- The historic context organizes information based on a cultural theme and its geographical and chronological limits.
- Contexts describe the significant broad patterns of development in an area that may be represented by archaeological resources.
- Historic contexts are the foundation for decisions about identification, evaluation, and treatment of archaeological resources.

When artifacts are looted or when sites are illegally excavated, the historic context is compromised and the relationship of one cultural resource to another harder to understand.

Context is Critical

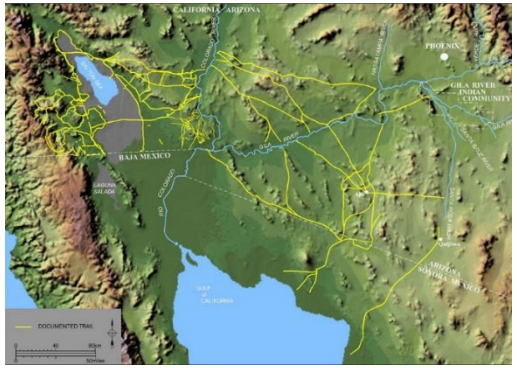
Documenting context is a primary responsibility of an archaeologist and DATs

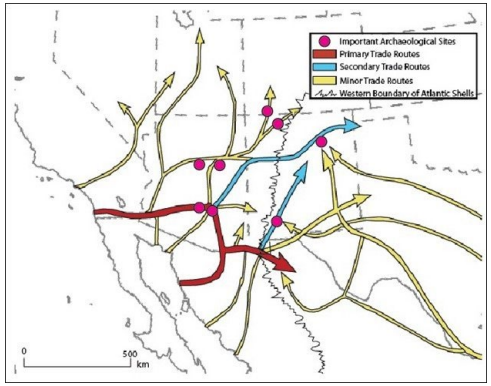
- Precise data collection
- Detailed notes of observations
- Accurate mapping
- Hi-resolution photography

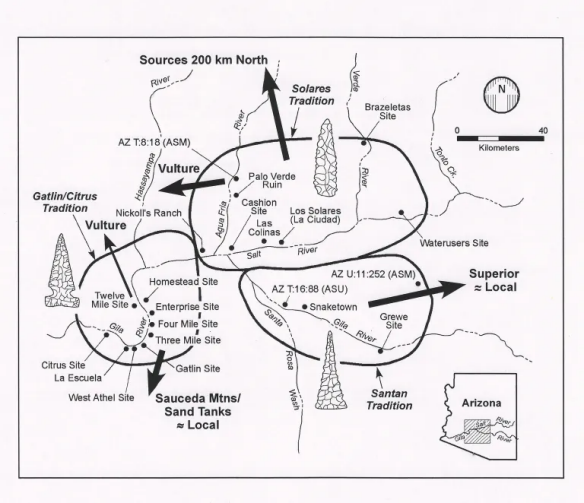
The Science of Archaeology

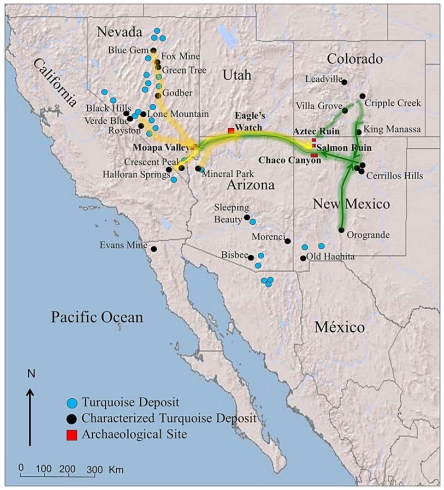
Archaeology can address a wide range of questions about the past, including:

- Age of site
- Subsistence
- Human diet/health
- Technology
- Settlement Patterns
- Trade and economic systems
- Mobility
- Religion
- Mortuary practices
- Social organization
- Transportation
- Physical & Sociopolitical Environment





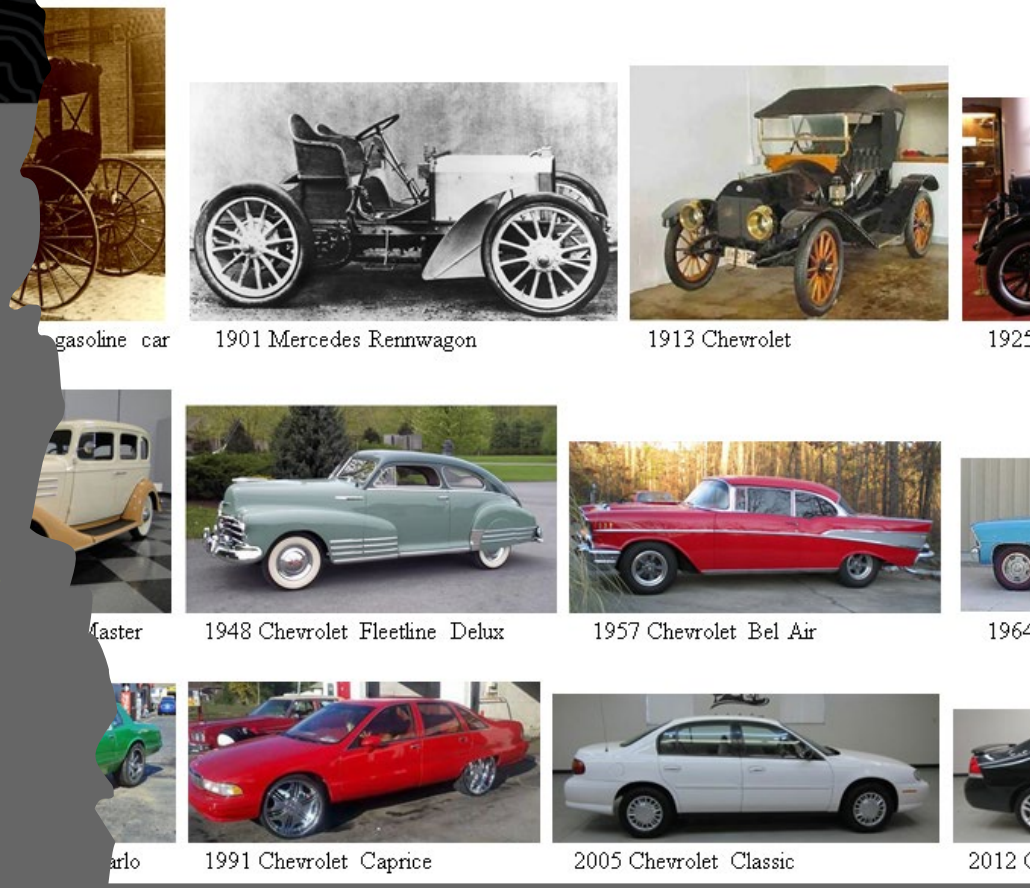


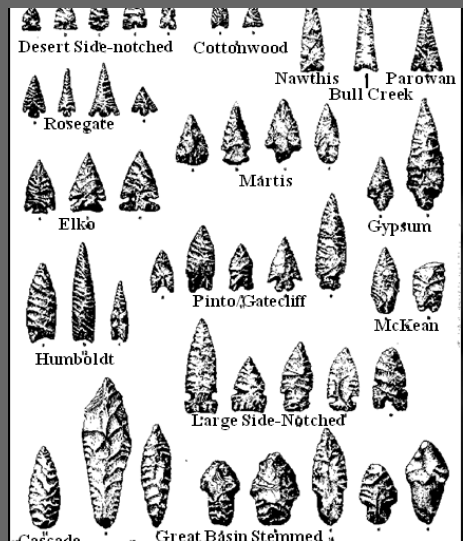


Typology

One of the important concepts in archaeology is typology, which allows for the organization of archaeological materials into useful categories.

Typology – The systematic classification of a specific artifact, feature or site type, usually related to timescale





Determining Age

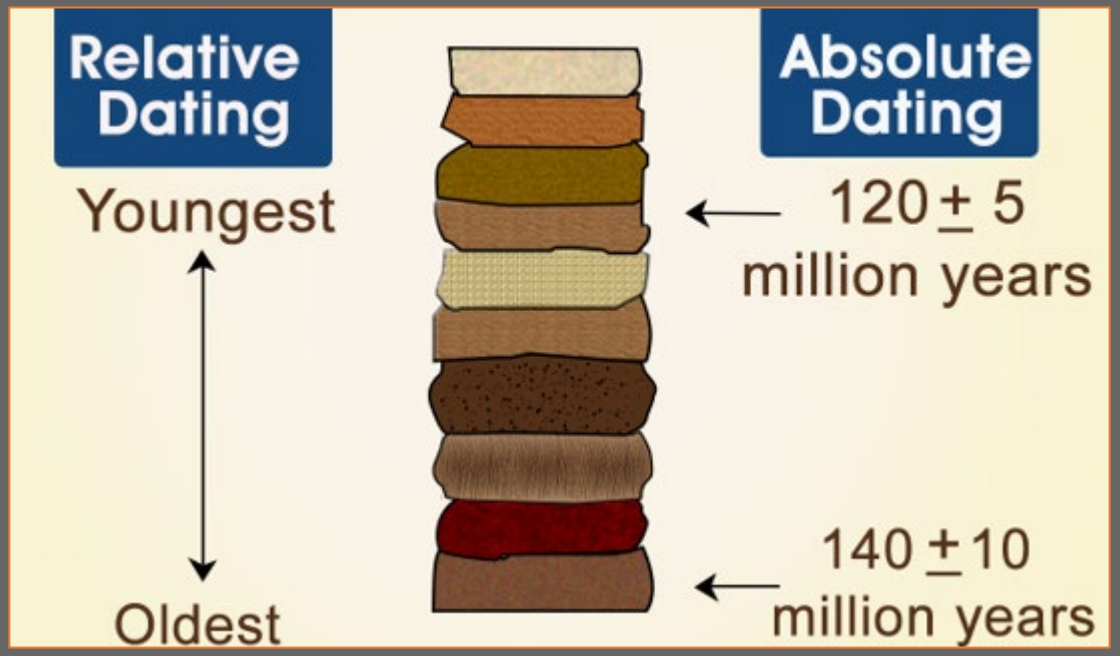
Determining the age of a site is critical for placing a site within a regional chronology and for answering other archaeological questions. There are two types of archaeological dating:

Relative dating

Simply determining whether something is older or younger than another thing

Absolute dating

Assigning a calendar date to an artifact or stratum



Relative Dating

There are two methods of relative dating:

- Cross Dating
- Stratigraphic Location

Cross Dating

Cross-dating works on the principle that a diagnostic artifact dated at one archaeological site will be of the same approximate age as one found elsewhere. Because projectile point styles/types changed over time we can roughly date the age of a site or strata within a site based on the types of artifacts present.

Stratigraphic Location

In depositional environments, soil may be deposited in layers called strata. In undisturbed deposits, the youngest strata are located on top and the oldest at the bottom. This is called the law of superposition.

Absolute Dating

Common absolute dating methods in archaeology include:

- Tree-Ring dating
- Radiocarbon dating
- Thermoluminescence dating
- Obsidian Hydration

Tree-Ring Dating

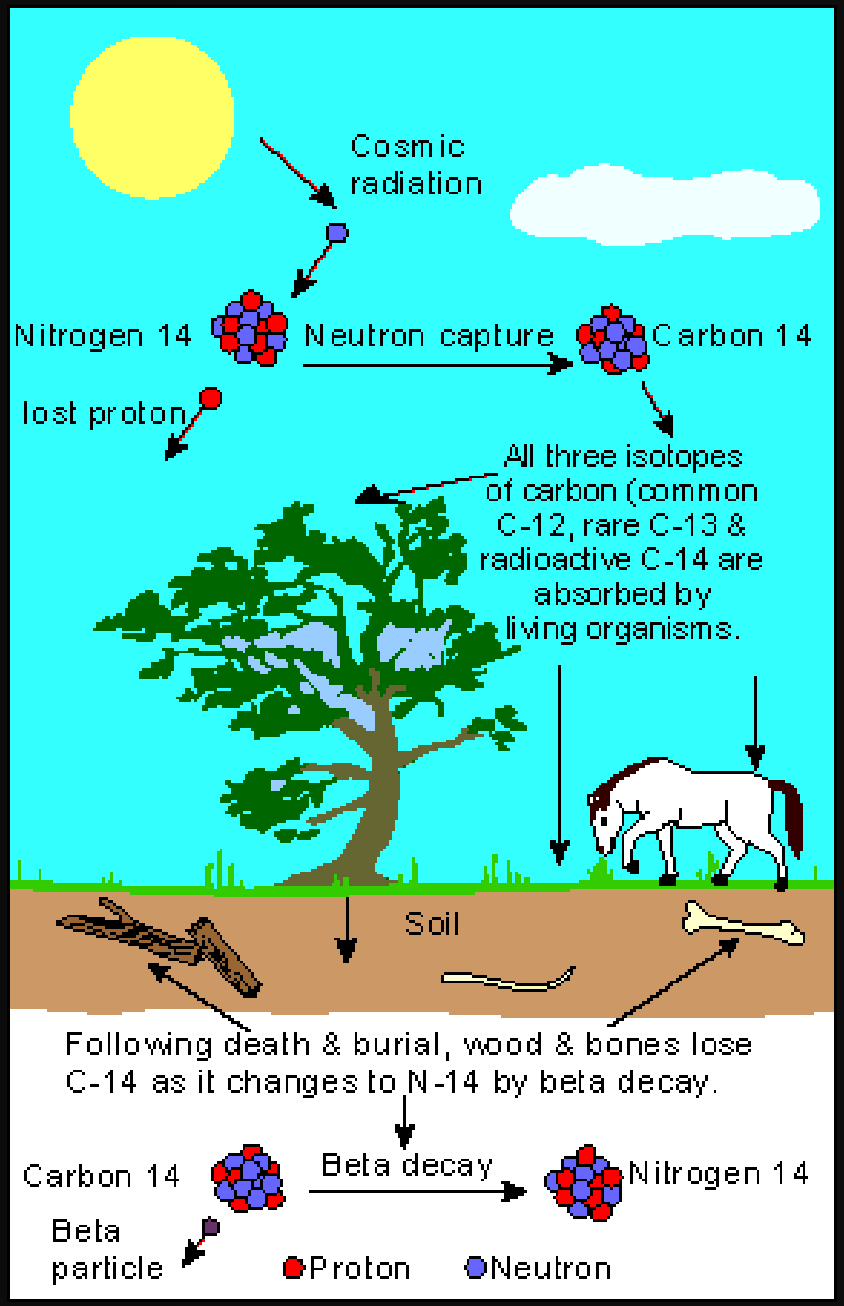
Tree-ring dating, or dendrochronology, is based on the principal that many tree species put on a single growth ring every year. The age of the tree can be determined by counting the number of rings.

Radiocarbon Dating

C-14 dating is based on the ratio of carbon 14 to carbon 12 in the remains of dead plants and animals.

Radiocarbon Dating

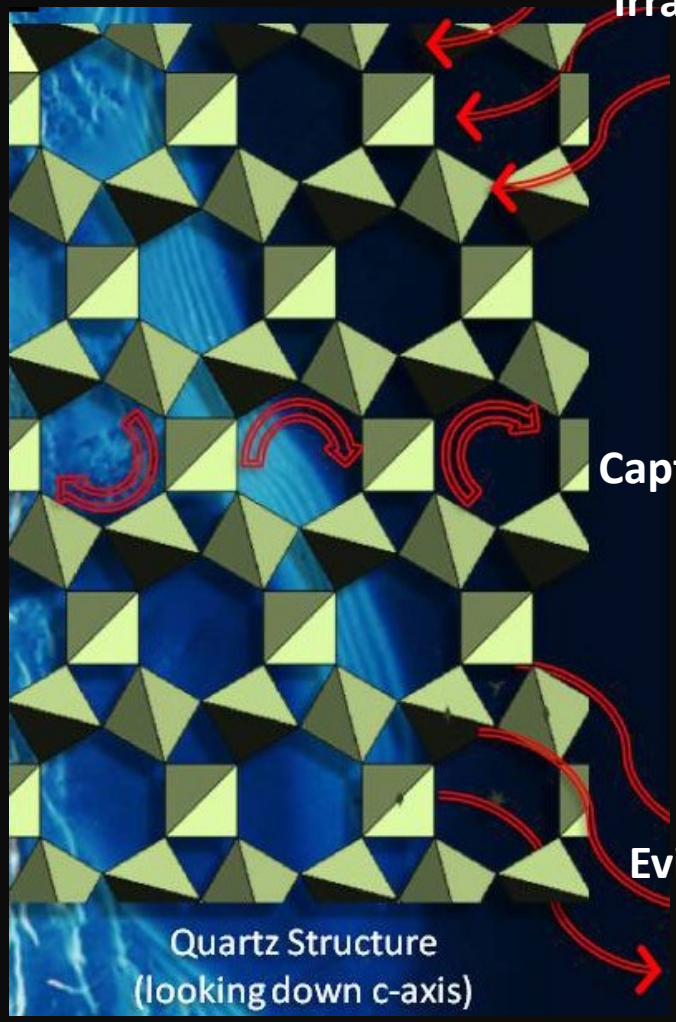
- Carbon 14 decays to nitrogen 14 by emitting an electron and an antineutrino, while changing one of its neutrons to a proton.
- It takes 5,730 years for half the Carbon-14 in an object to decay into Nitrogen 14. By determining the ratio of C-14 to C-12 it is possible to determine when the object died.



Thermoluminescence Dating

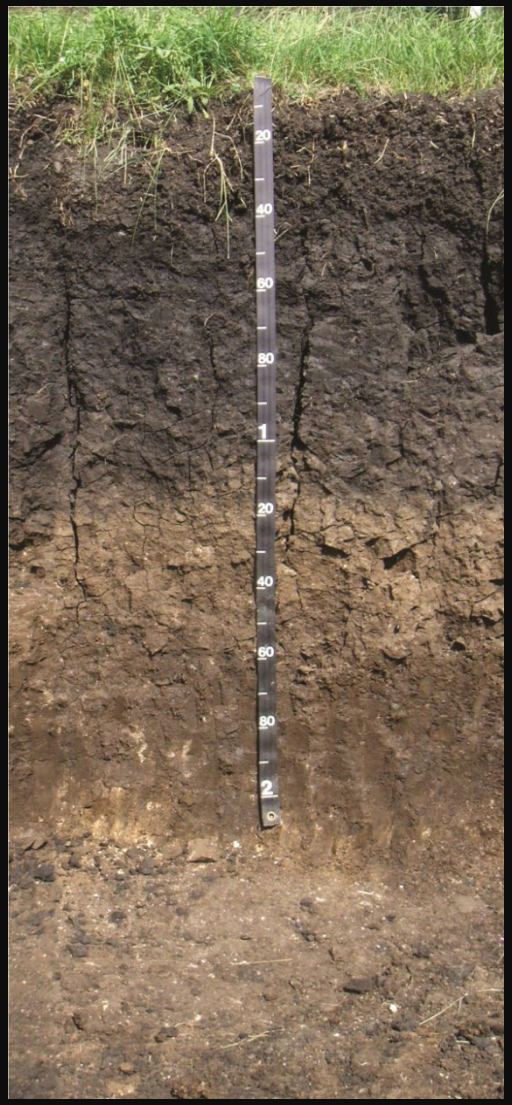
Used for artifacts like ceramics with "crystal structures" that have been previously heated.

- Objects emit electrons when heated "zeroing out" the number of trapped free electrons.
- Over time these objects again slowly absorb electrons from their surroundings at a known rate.
- In the laboratory these artifacts are reheated under controlled conditions, releasing the trapped electrons and emitting light. The released radiation dose is measured providing a date when the artifact was last heated



Thermoluminescence Dating

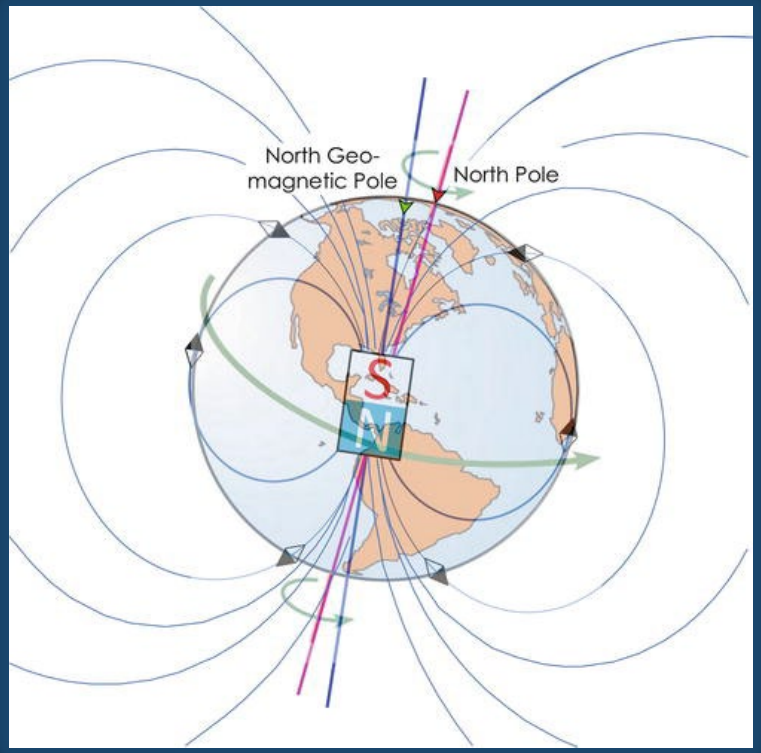
Fire Cracked Rock



Ceramics

Exposure of soils to sunlight also “zeros out” trapped electrons allowing dating of buried sediments

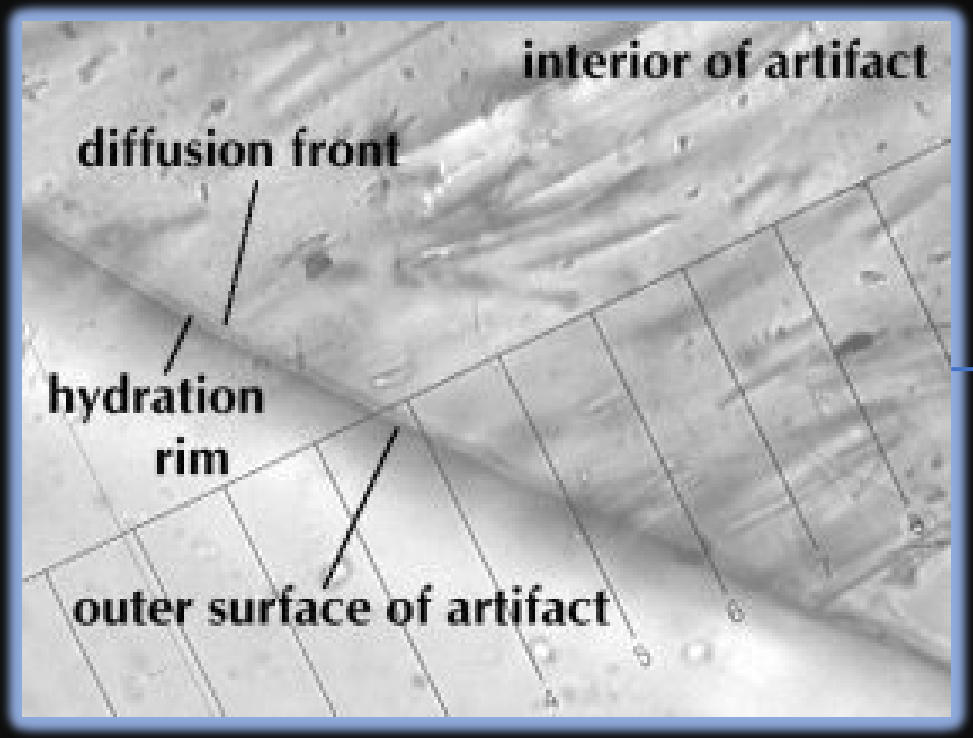
Archaeomagnetic Dating



Microscopic iron particles in soil align with the north pole which shifts positions over time. Particles in clay soils like an ancient hearth are frozen in place if heated above the curie point, allowing calculation of the age of the hearth based on known orientation of the north pole thru time.

Obsidian Hydration Dating

Obsidian absorbs water at the molecular level, creating a microscopically visible band. Older artifacts have a thicker band than younger artifacts.



Subsistence

How do we figure out how people made a living?

Plant Foods

The presence of certain tools can suggest, at a general level, that plants were being processed.

Mortar and Pestle, were usually used with roots or hard nuts

Manos and metates were typically used for grinding hard shelled seeds

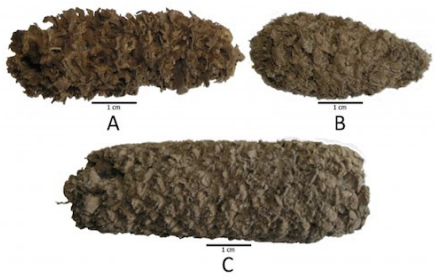
House floor with storage pits and post holes

Hearth

Plant Foods

Micro and Macro plant remains as well as chemical residues may survive in hearths, house floors, storage pits, other features and coprolites.

Quids, (fiber from chewed plant leaves, roots or stems)



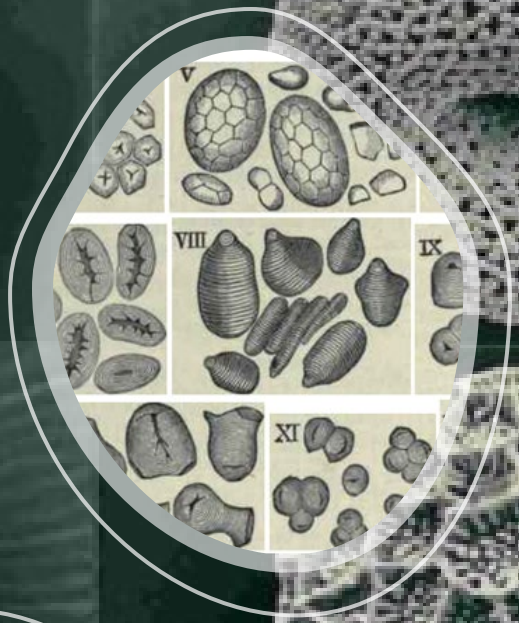
Corn Cobs

Prickly pear pads

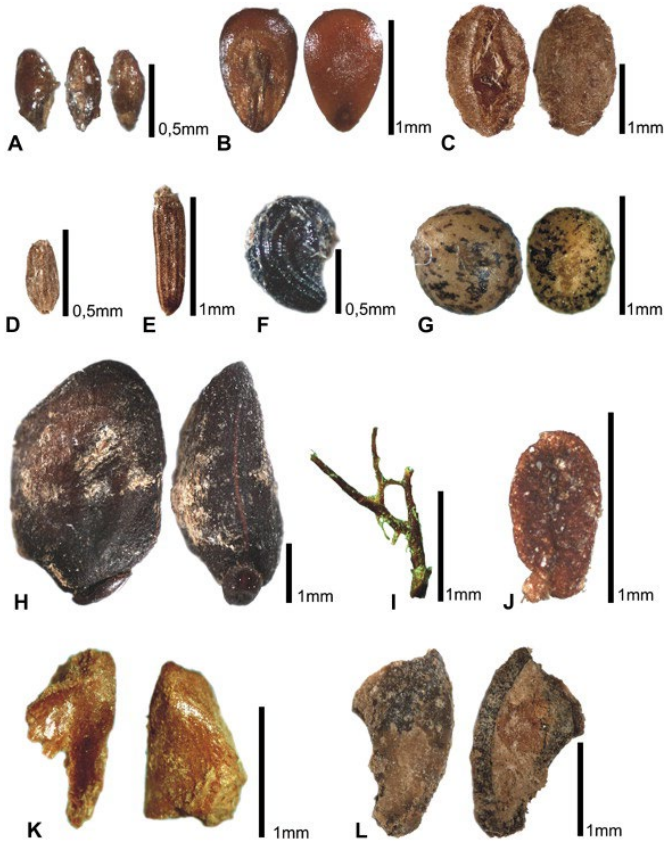
The arid climate of the Desert Southwest results in remarkable preservation of plant remains

Microscopic Plant Remains

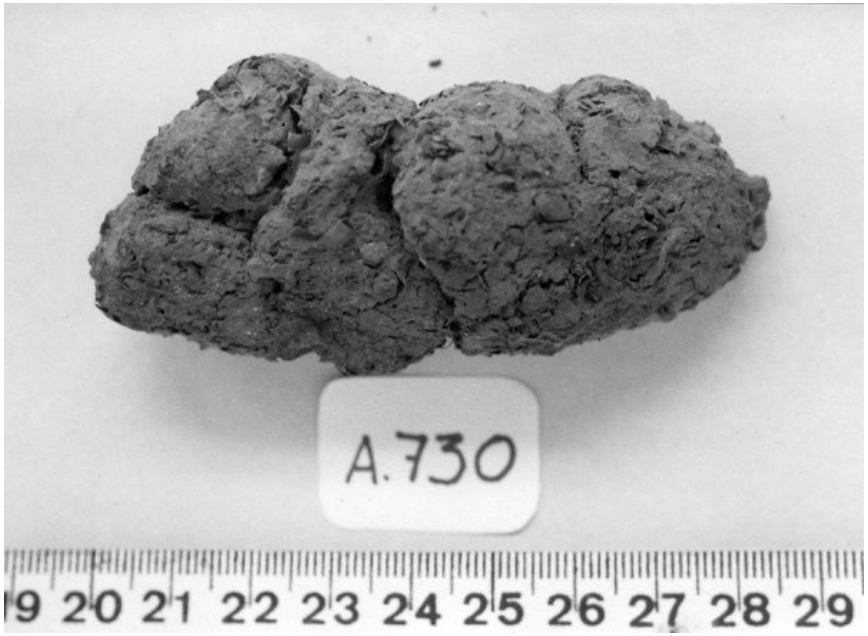
Pollen grains, starch granules, and phytoliths.



Plant remains from coprolites



Seeds and fruiting body fragments



Grinding Stones

Pottery

Stone Tools

Sediments & Soils

Food and other plant remains may be found on:

Animal Foods

Certain tools and features can point to generalized animal food acquisition

Animal trap made of juniper limbs

Hunting Blinds

Spear and Projectile Points

Animal bones and shells in archaeological sites can be evidence of hunting & meat consumption

1. Burned bones
2. Butchering cut marks
3. Large animals
4. Bones smashed to extract marrow
5. Small animals

Technology & Tool Use

Humans are not particularly strong or fast when compared to other animals, but we have been able to conquer the world through technology.

An important part of archaeology is the study of the many technologies and approaches people have used to adapt to various environments.

Generalizations regarding technology can be made based on the types of artifacts present.

Lithic Technology

People around the world used stone to produce tools for every-day use. Stones such as obsidian, chert, basalt, rhyolite, quartzite, quartz crystal that break with a conchoidal fracture were used to make flaked stone tools such as spear points, knives, scrapers, etc.

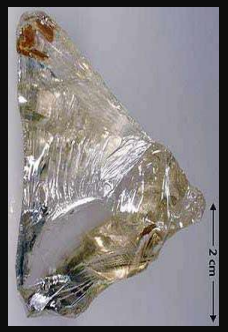
Obsidian

Fine grained basalt

Chert

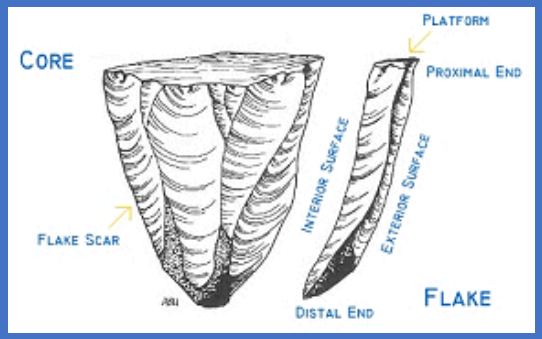
Rhyolite

Quartzite

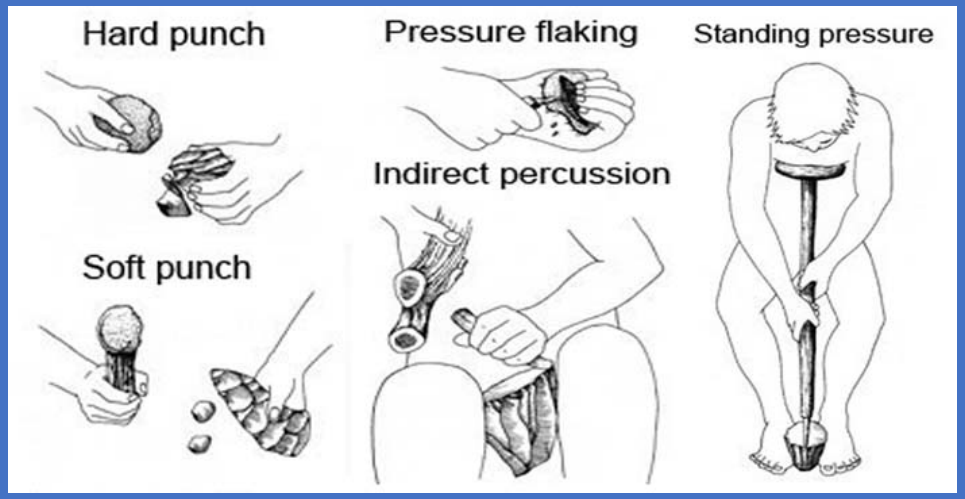


Quartz crystal

Flintknapping

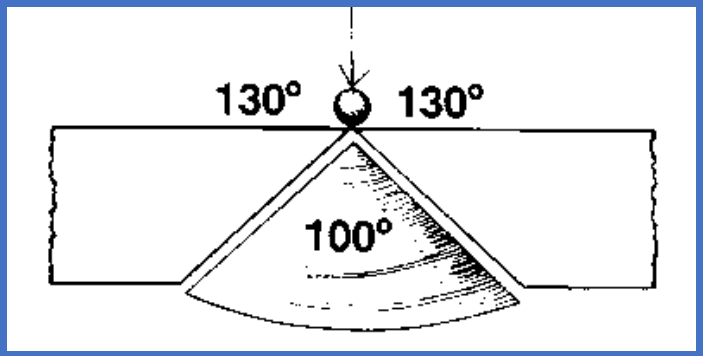


Stone tool manufacturing (a.k.a. flint knapping) requires the proper amount of force at the proper angle to remove flakes from a piece of stone, shaping it into the desired tool.

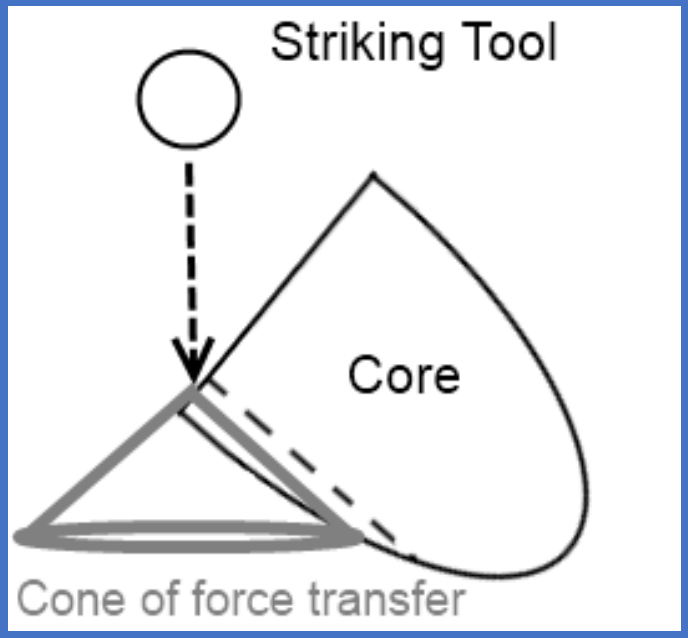


Flintknapping

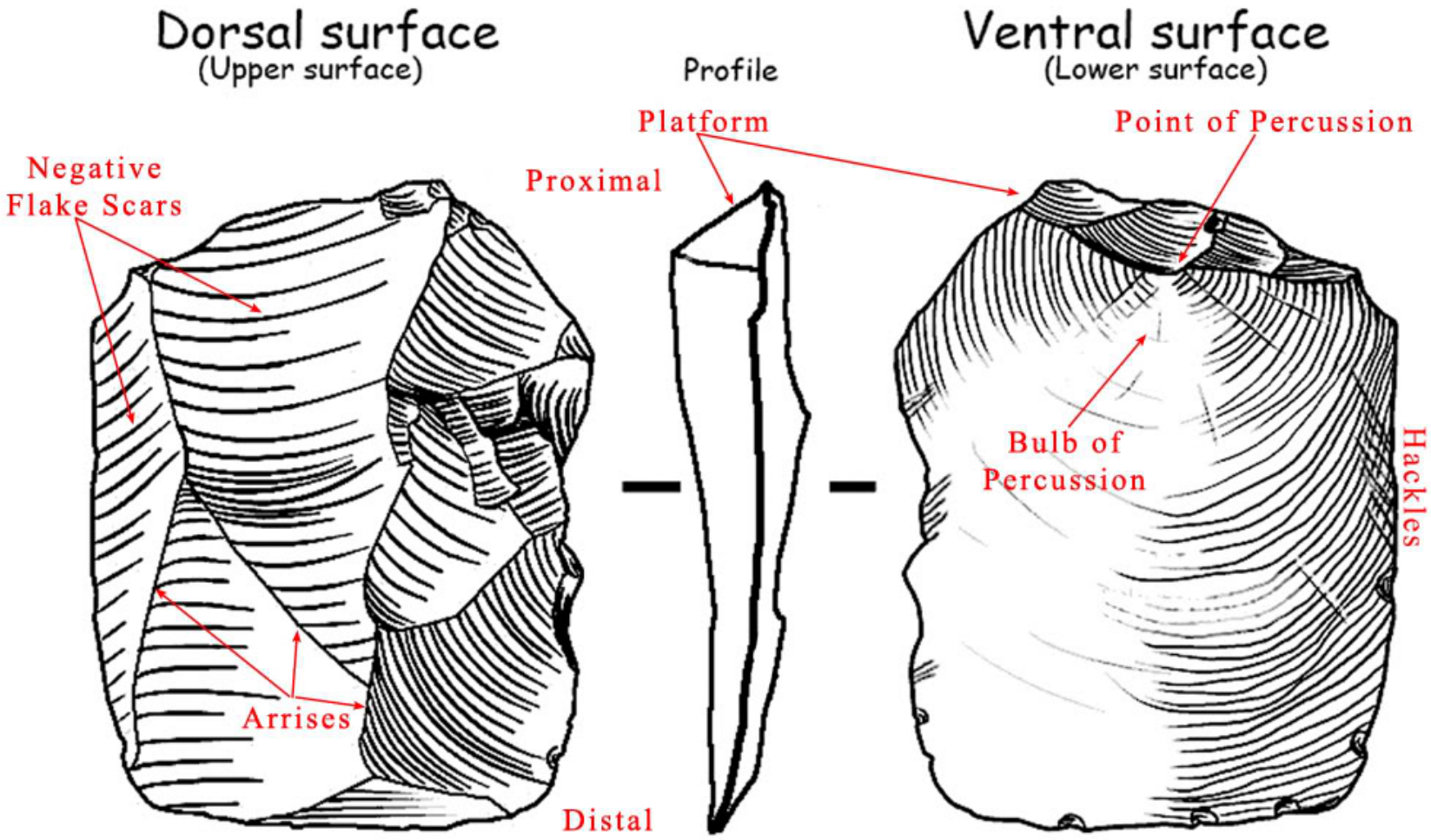
Fine-grained rocks fracture conchoidally and when sufficient force is applied to the center of a piece, such as a BB striking a window, a perfect cone is produced.



But when the force is applied to the edge of a piece of stone such as in flint knapping only the edge of the cone is produced. This is what we call a flake.



Typical Characteristics of a Flake



Collateral

Oblique Parallel

Random Pressure

Transverse

Random Percussion

Parallel

The types of flakes present at a site indicate the stage(s) of lithic production.

Raw Material

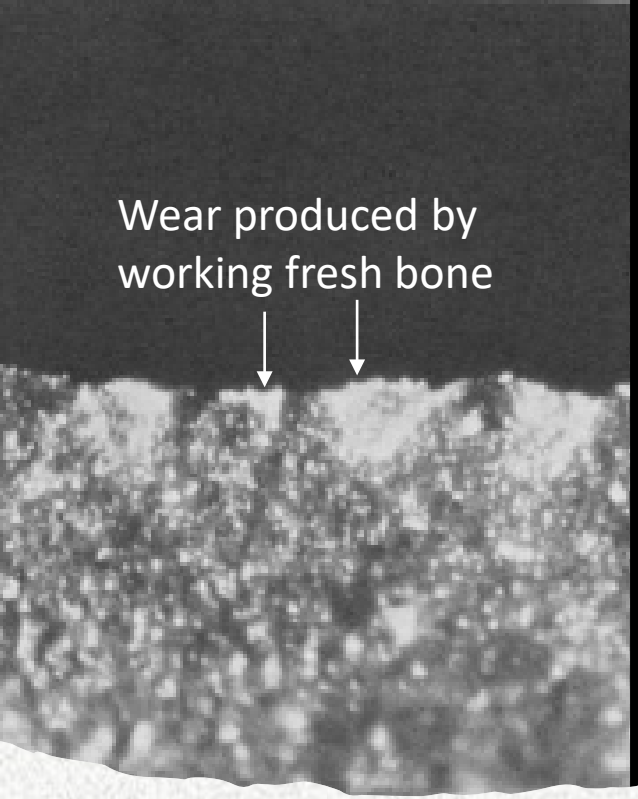
Hard Hammer

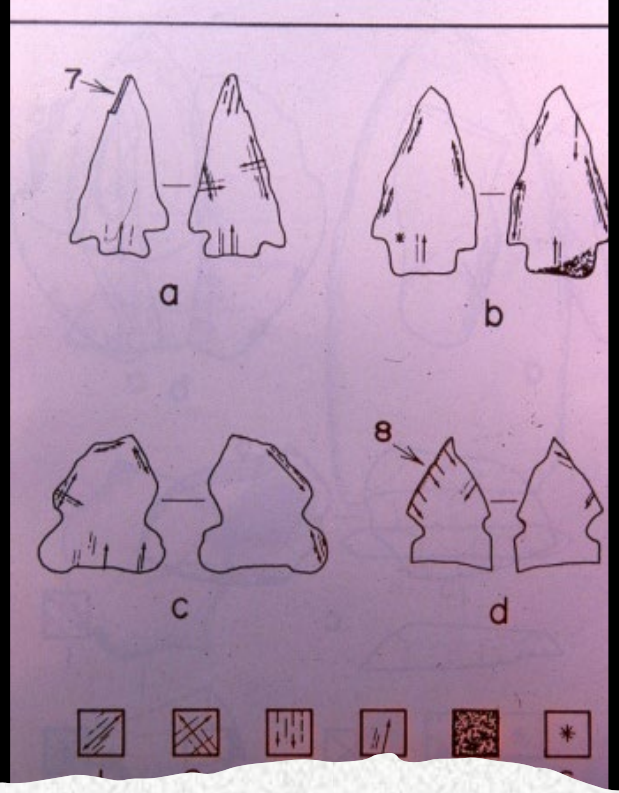
Hard Hammer

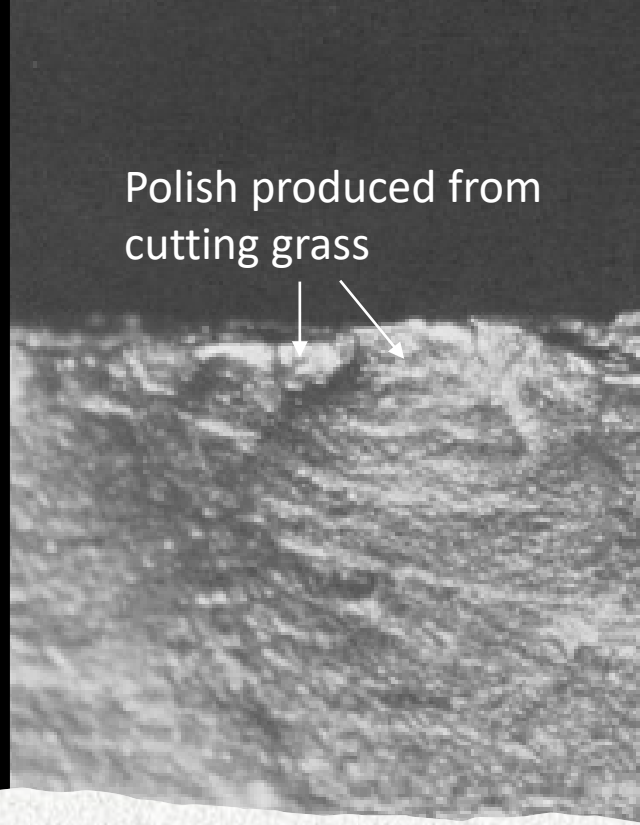
Soft Hammer

Pressure

Pressure

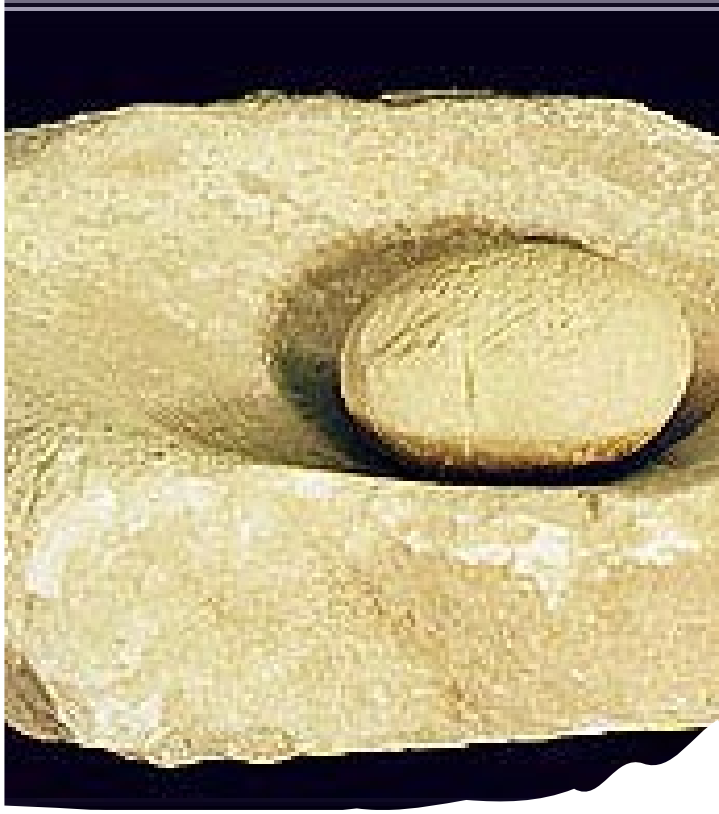




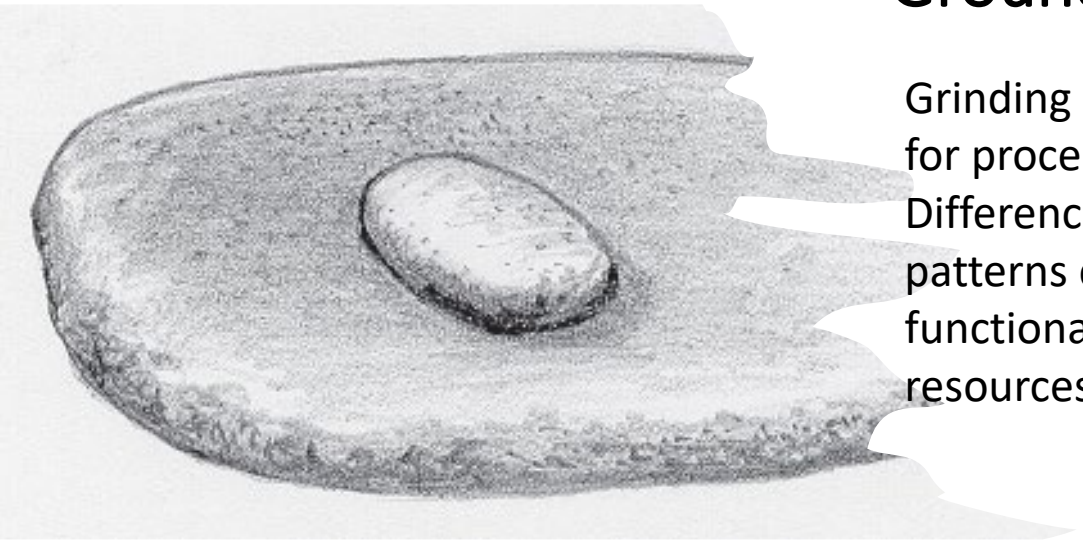


Use-wear analysis

Microscopic analysis can determine how stone tools were used and on what substrate.



Ground Stone Technology



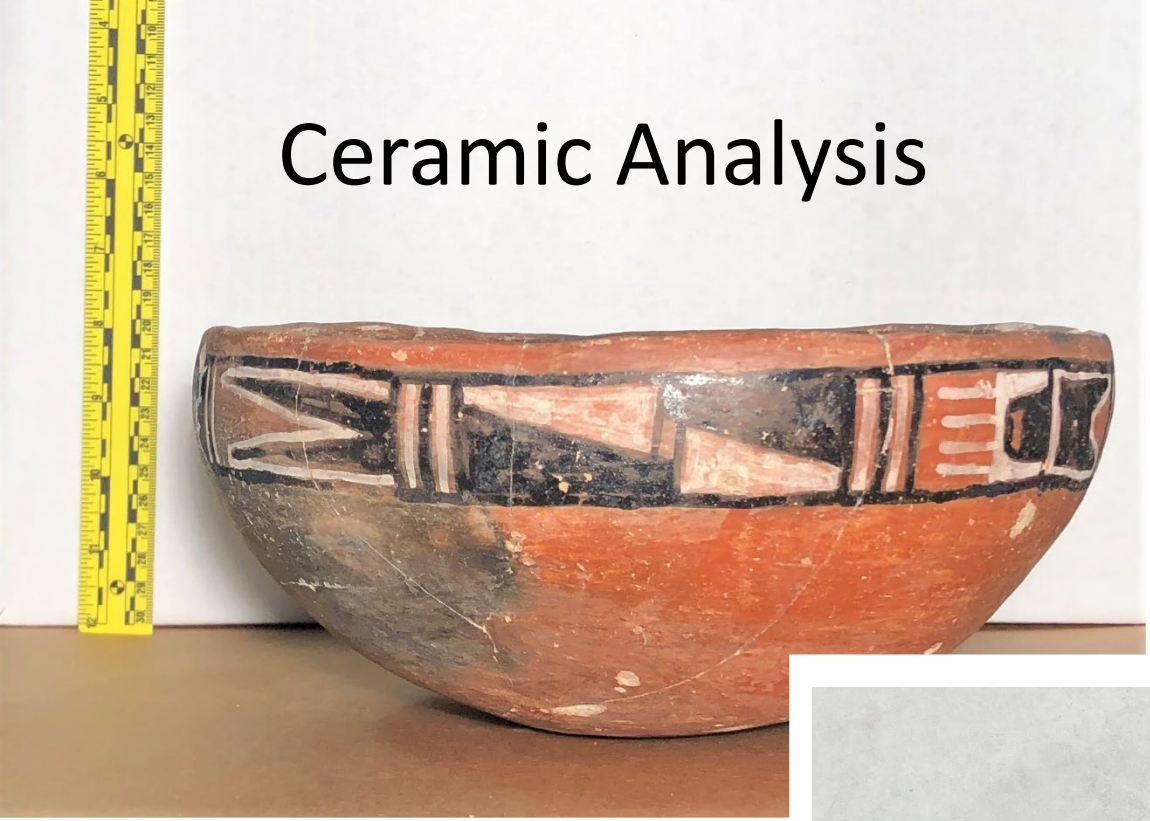
Grinding stones were used by most cultures for processing foods, particularly plant foods. Differences in form, manufacture and wear patterns can inform us of cultural and functional differences, and the types of resources that were processed.

Textile Analysis

Basket making and weaving techniques for important items like this sandal were handed down from generation to generation.

In Arizona, Yucca fibers were used to make baskets, sandals, and rope. Yucca are important to modern Tribal people for traditional use gathering and maintaining cultural heritage and identity.

Ceramic Analysis



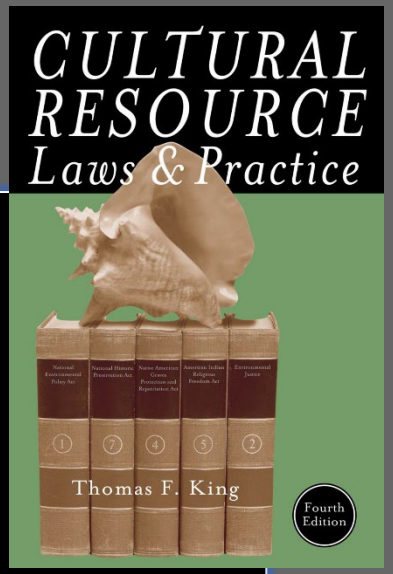
Archaeologists can study ceramics to learn more about how people in the past lived. Vessel form, rims, and design elements provide important information. Archaeologists can also source the clay, temper, minerals, and other organic materials to learn more about the past through examination of ceramics.

Thus far we have discussed a rudimentary overview of archaeology. Some key points discussed include:

- Federally recognized Indian Tribes are deeply connected to the archaeology of Arizona, and it represents their cultural heritage and ancestry
- Goals of archaeology
- Context
- Material culture
- Sites
- Methods of dating
- Types of analysis

In the second part of this training, we will discuss various cultural resources laws and the basics of archaeological fieldwork.

Cultural Resources Laws & Executive Orders



- Antiquities Act of 1906
- Historic Sites Act of 1935
- National Historic Preservation Act of 1966
- Archaeological and Historic Preservation Act 1974
- American Indian Religious Freedom Act of 1978
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Curation of Federally Owned and Administered Archaeological Collections (36 CFR 79 issued in 1990)
- EO 11593 Protection & Enhancement of the Cultural Environment
- EO 13007 Indian Sacred Sites
- EO 13175 Consultation & Coordination with Indian Tribal Governments
- EO 13287 Preserve America

NHPA Preamble

1966 National Historic Preservation Act (NHPA)

The Congress finds and declares that-

- the spirit and direction of the Nation are founded upon and reflected in its historic heritage;
- historic properties significant to the Nation's heritage are being lost or substantially altered, often inadvertently, with increasing frequency;
- the preservation of this irreplaceable heritage is in the public interest so that its vital legacy of cultural, educational, aesthetic, inspirational, economic, and energy benefits will be maintained and enriched for future generations of Americans;

Section 110 of the NHPA

- Title 54 § 306102 establishes the BLM Cultural Heritage Program
- Each Federal agency shall establish a preservation program for the identification, evaluation, and nomination to the National Register, and protection, of historic properties.
- Provides the statutory authority to appropriate federal funding for historic preservation (BLM = L1050 Subactivity)
- L1050 Program Elements captures these non-project related preservation activities required by the law

Section 106 of the NHPA

54 U.S.C. 306108

The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted **undertaking** in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, **take into account the effect of the undertaking on any district, site, building, structure, or object** that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a **reasonable opportunity to comment** with regard to such undertaking.

In short…

Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and afford the ACHP an opportunity to comment.

Section 106

- All federal agencies under the executive branch of the U.S. government are subject to Section 106
- Compliance with Section 106 is a federal agency responsibility
- Section 106 process is to ensure that federal agencies consult with interested parties to:
  - Identify & evaluate historic properties
  - Assess the effects of their undertakings on historic properties
- Section 106 encourages a preservation outcome, but does not require it
- Section 106 ensures that a federal agency assumes responsibility for the consequences of its undertakings on historic properties

Section 106 is a procedural law, not a disclosure law like NEPA. If there are adverse effects, an agency must resolve the effects to be compliant.

36 C.F.R. part 800

36 C.F.R. 800 implements the Section 106 Process

- Title 54 § 304101 established the Advisory Council on Historic Preservation (ACHP)
- Title 54 § 304108 directs the ACHP to promulgate the regulations
- The Section 106 process is found in 36 C.F.R. 800 Subpart B, and specifically in 800.3 – 800.

36 C.F.R. part 800

36 C.F.R. 800 “Protection of Historic Properties”

- Implements Section 106 of the NHPA
  - Mandates the historic preservation review process
  - Sometimes referred to as the Section 106 Process

- There is no such thing as a “Section 106 clearance”
  - Conduct Section 106 review and analysis
  - We do not “clear land” - we “review undertakings”

36 C.F.R. part 800

1. Purposes
2. Participants in the Section 106 process
3. **Initiation of the Section 106 process**
4. **Identification of historic properties**
5. **Assessment of adverse effects**
6. **Resolution of adverse effects**
7. **Failure to resolve adverse effects**
8. Coordination with NEPA
9. Council review of Section 106 compliance
10. Special requirements for protecting NHLs
11. Documentation standards
12. Emergency situations
13. Post-review discoveries
14. Federal agency program alternatives
15. Tribal, State, and Local Program Alternatives
16. Definitions

Section 106 Process

1. Initiate Section 106 Process
2. Identify Historic Properties
3. Assess Effects
4. Resolve Adverse Effects

The steps in the 106 process, as in most processes, must be completed sequentially.

Initiate the 106 Process

- Establish undertaking
- Identify appropriate SHPO/THPO
- Plan to involve the public
- Identify other consulting parties

Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval.

Identify Historic Properties

Determine scope of identification efforts

- Define the Area of Potential Effects (APE)

Identify historic properties

- Class I inventories, Class II & III surveys, Ethnographic studies, oral histories, GIS modeling, aerial imagery

Evaluate historic significance

- Evaluate site for its National Register eligibility

Area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

Assess Effects

Apply criteria of adverse effect (Defined in 36 CFR 800.5)

800.5(a)(1) An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

800.5(a)(2) Examples of adverse effects include physical destruction or damage; alteration not consistent with the Secretary of the Interior's Standards; relocation of a property; change of use or physical features of a property's setting; visual, atmospheric, or audible intrusions; neglect resulting in deterioration; or transfer, lease, or sale of a property out of Federal ownership or control without adequate protections

There are only 3 outcomes or findings of effect in the 106 process: 1) Adverse Effect; 2) No Adverse Effect; and 3) No Historic Properties Affected

Resolve Adverse Effect

Continue consultation

- Invite the ACHP to participate
- Continue consultations with SHPO, THPO, public, and other consulting parties

Develop a MOA or project specific PA

- MOAs are described in 36 CFR 800.6
- PAs are described in 36 CFR 800.14
- Legally binding contracts in courts of law
- Evidences agency's compliance with 106

Effects must be resolved and any MOA/PA executed before DRs, RODs, and NTPs are issued to be compliant.

Section 106 Review Process

36 CFR § 800.3-7

INITIATE the process

- Determine undertaking
- Coordinate with other reviews
- Identify SHPO/THPO, Indian tribes/NHOs, and other parties
- Plan to involve the public

No undertaking with potential to affect historic properties?

NO

IDENTIFY historic properties

- Determine APE and scope of effort
- Make reasonable and good faith effort to identify
- Determine National Register eligibility
- Consult SHPO/THPO, Indian tribes/NHOs, and other parties
- Involve the public

No historic properties present or affected?

NO

ASSESS adverse effects

- Apply Criteria of Adverse Effects
- Consult SHPO/THPO, Indian tribes/NHOs, and other parties
- Involve the public

No historic properties adversely affected?

NO

RESOLVE adverse effects

- Develop and consider alternatives or modifications to avoid, minimize, or mitigate adverse effects
- Notify the ACHP
- Consult SHPO/THPO, Indian tribes/NHOs, and other parties
- Involve the public

AGREEMENT or Council Comment

PROCEED

CONSULTATION

National Register Evaluations

There are 5 property types:

- Sites
- Buildings
- Structures
- Objects
- Districts

Landscapes can be accommodated by using the District property type.

National Register Evaluations

Must meet one or more of the four criteria:

A. Events
B. Persons
C. Works of a master
D. Information

NPS National Register Bulletin 15 provides more detail on these criteria.

National Register Evaluations

Must also retain integrity in at least one of seven aspects:

1. Location
2. Design
3. Setting
4. Association
5. Feeling
6. Workmanship
7. Materials

NPS National Register Bulletin 15 provides more detail on these aspects of integrity.

Types of Inventory

There are three types of inventory recognized by the BLM:

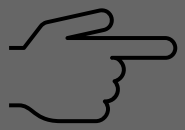
1. Class I
2. Class II – Probabilistic Sample
3. Class III – Intensive Survey

The 8110 manual recognizes Reconnaissance Surveys, but the lands subjected to these types of surveys are not considered "inventoried".

Archaeological Fieldwork

Archaeological Fieldwork conducted by DATs will mainly consist of:

1. Survey
2. Site recording
3. Monitoring/Site Protection

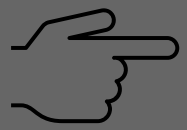


Safety first!

Archaeological Surveys

Archaeological surveys are systematic studies that examine the surface for material remains.

- Conducted in transects spaced no greater than 20-m apart.
- Usually conducted on North-South or East-West headings.



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Archaeological Site Recording

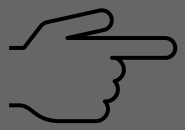
Archaeological site recording consists of:

- Completion of a Site Card
- Producing plan view drawings (sometimes called a site map)
- Producing site location maps
- Photographing the site and diagnostic material remains
- Recording Global Positioning System information

Archaeological Site Monitoring

Archaeological site monitoring consists of:

- Closely observing ground disturbing activities to ensure no damage to cultural resources occurs
- Halt ground disturbance if resources are observed
- Contact field office archaeologist ASAP



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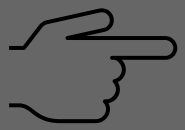
Archaeological Site Flagging

DATs may also be asked to flag cultural resources for avoidance. This usually entails:

- Using GPS/GPS-enabled tablets to identify the boundary of site
- Creating a buffered perimeter around the site using flagging tape
- Cultural Specialist will determine buffer



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Next steps in DAT certification

- Completion of open-book test
- Two-days of survey and site recording

Safety first! Always wear PPE

Questions?