U.S. Department of Housing and Urban Development, Office of Policy Development and Research

Culturally and Environmentally Responsive Design:

Case Studies in Sustainable Design & Planning in Indian Country

Presented by
Daniel J. Glenn, AIA, NCARB
Principal, 7 Directions Architects/Planners

Little Big Horn College
Crow Agency, Montana
December 10-11, 2013

Thank you to the Little Big Horn College for graciously hosting this training session.

HUD Sustainable Construction in Indian Country Initiative

- Created to support and increase sustainable construction practices in Native communities.
- Administered through HUD's Office of Policy Development and Research (PD&R) in partnership with HUD's Office of Native American Programs (ONAP).
- Congressionally mandated initiative

Medicine Wheel – Bighorn Mountains, Wyoming

"Everything the Power of the World does is done in a circle… Our tepees were round like the nests of birds, and these were always set in a circle…But the Wasichus have put us in these square boxes. Our power is gone and we are dying, for the power is not in us anymore. You can look at our boys and see how it is with us. When we were living by the power of the circle in the way we should, boys were men at twelve or thirteen years of age. But now it takes them very much longer to mature. Well, it is as it is."

Black Elk

7 Directions
ARCHITECTS
PLANNERS

Culturally and Environmentally Responsive Design:
Case Studies in Sustainable Design & Planning in Indian Country

Tuesday AM, December 10:

8:30 am – 9:00 am	Registration
9:00 am – 9:30 am	Introductions and Expectations
9:30 am – 10:30	**Learning from Our Elders:** Lessons learned from traditional Native American architecture
10:30 am – 10:45 am	Break
10:45 am – 11:00 am	Excerpt from: ***Aboriginal Architecture / Living Architecture***
11:00 am – 11:45 am	**Sustainable Design for Tribal Communities:** Case Study: Re-envisioning Crow Agency: Little Big Horn Campus/ Apsaalooke Nation Capitol Case Study: 200 Unit Solar Village Master Plan - Salt River Pima/Maricopa
11:45 am – 12:00 pm	Discussion
12:00 pm –1:00 pm	Lunch – on your own

7 Directions
ARCHITECTS
PLANNERS

Culturally and Environmentally Responsive Design:
Case Studies in Sustainable Design & Planning in Indian Country

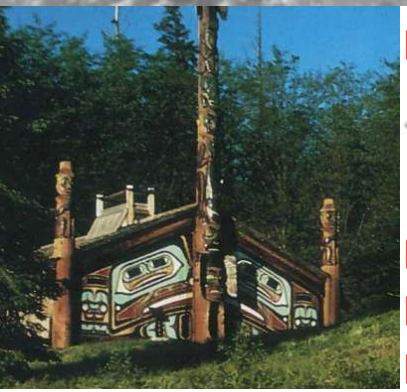
Tuesday PM, December 10:

1:00 pm – 2:30 pm	**Tour of Key Spots on the Campus and community**: Dance Arbor / Entrance Gateway Monument Cultural Learning Lodge / Drifting Lodges Classroom Building Library/Archive Administration Building Wellness Center Future site of the Apsaalooke Nation Capitol Complex
2:30 pm – 2:45 pm	Break
2:45 pm – 3:30 pm	**Community Engagement Process** Case Study: University of Montana Payne Family Native American Center (LEED Platinum) Case Study: Klamath Tribes Medicine Rock Wellness Center
3:30 pm – 4:30 pm	Discussion/Breakout groups to discuss projects/issues in participant communities

Iglu

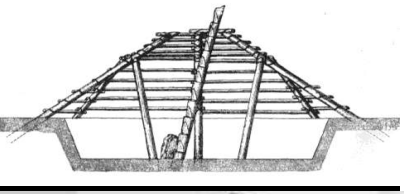
Tipi

Wigwam



Plank Long House

Long House



Pit House

Earth Lodge

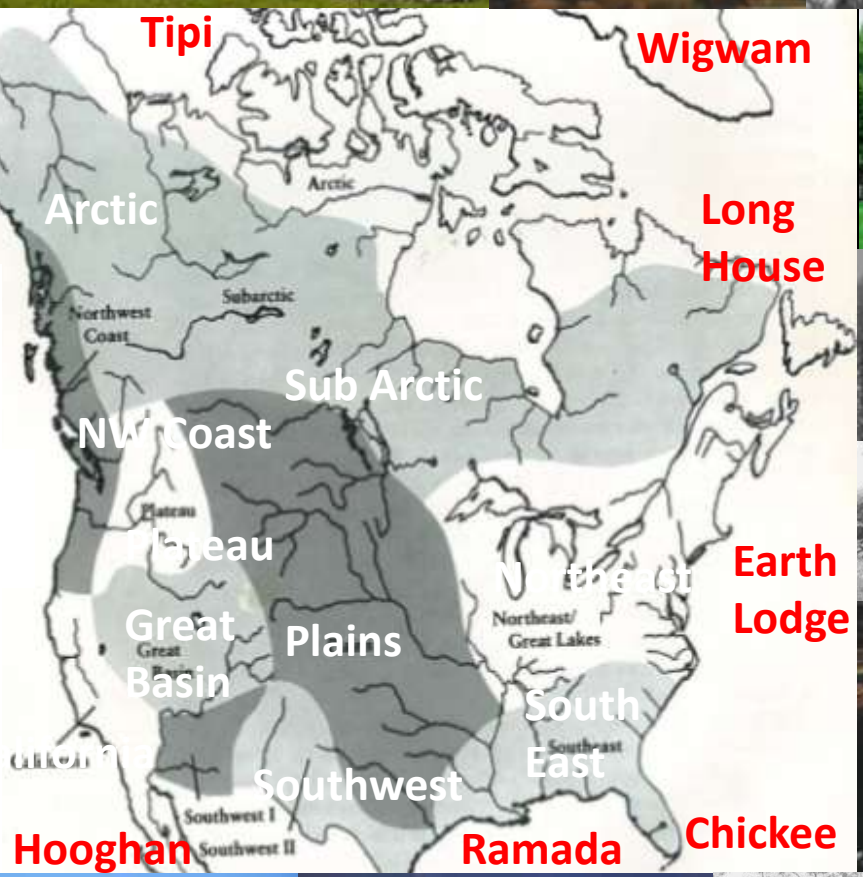
Matt House

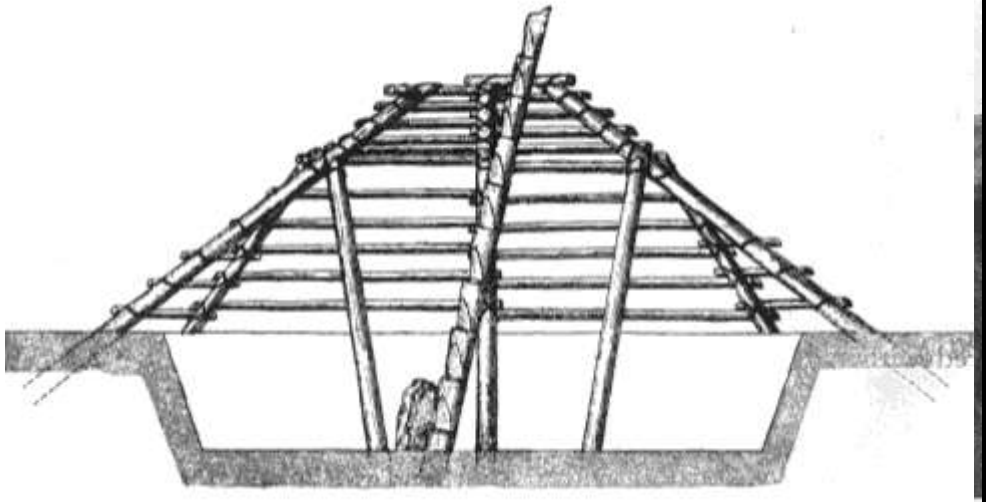
Pueblo

Hooghan

Ramada

Chickee





Plateau

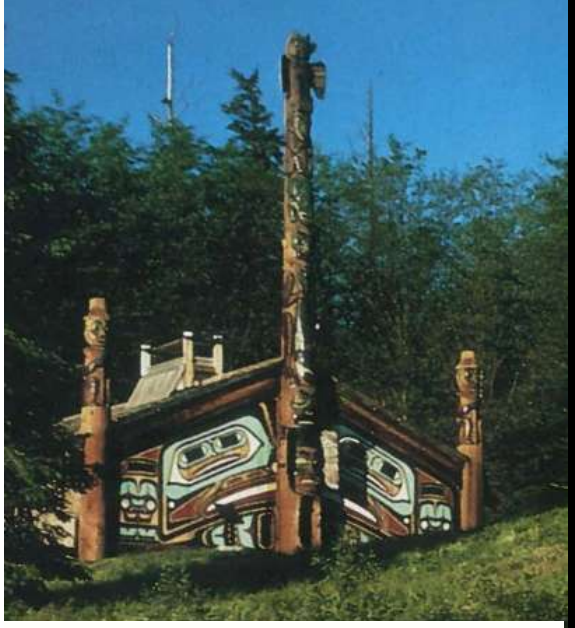
Climate:
Continental steppe Highlands

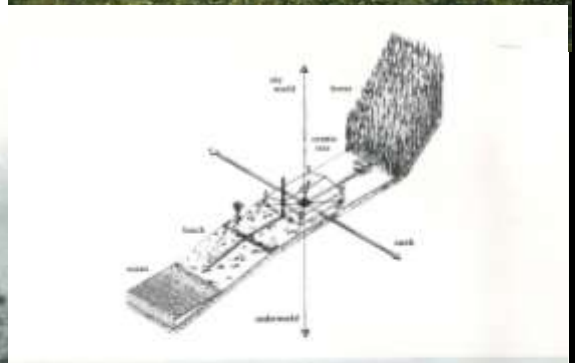
Ecology:
Forest, prairie

Materials:
Timber, saplings, sod, reed, canvas

Building Type:
Pit house, tipi, elongated tipi

Cultures include:
Nez Perce, Klamath, Flathead, Kutenai





Northwest Coast

Climate:
Temperate

Region:
Forest, islands, waterways

Materials:
Cedar Timber, split planks, bark

Building Type:
Plank House

Cultures include:
Haida, Tlingit, Chinook, Kwakiutl, Salish

Arctic

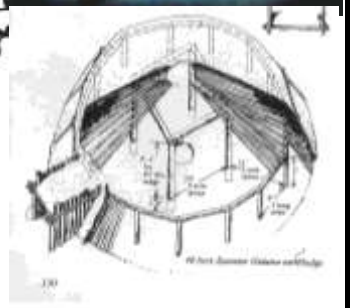
Climate:
Arctic / Subarctic

Ecology:
Tundra, mountains
Forests, waterways

Materials:
Snow, sod, timber, seal skin, stone, hide, canvas

Building Type:
Iglu, tent, barabara, kasim, wigwam, tipi

Cultures include:
Aleut, Inuit, Beaver, Sekani, Cree, Naskapi



Plains

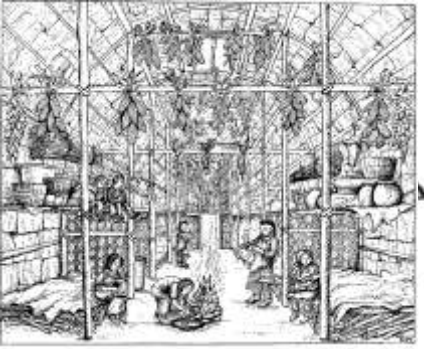
Climate:
Temperate, Continental Steppe

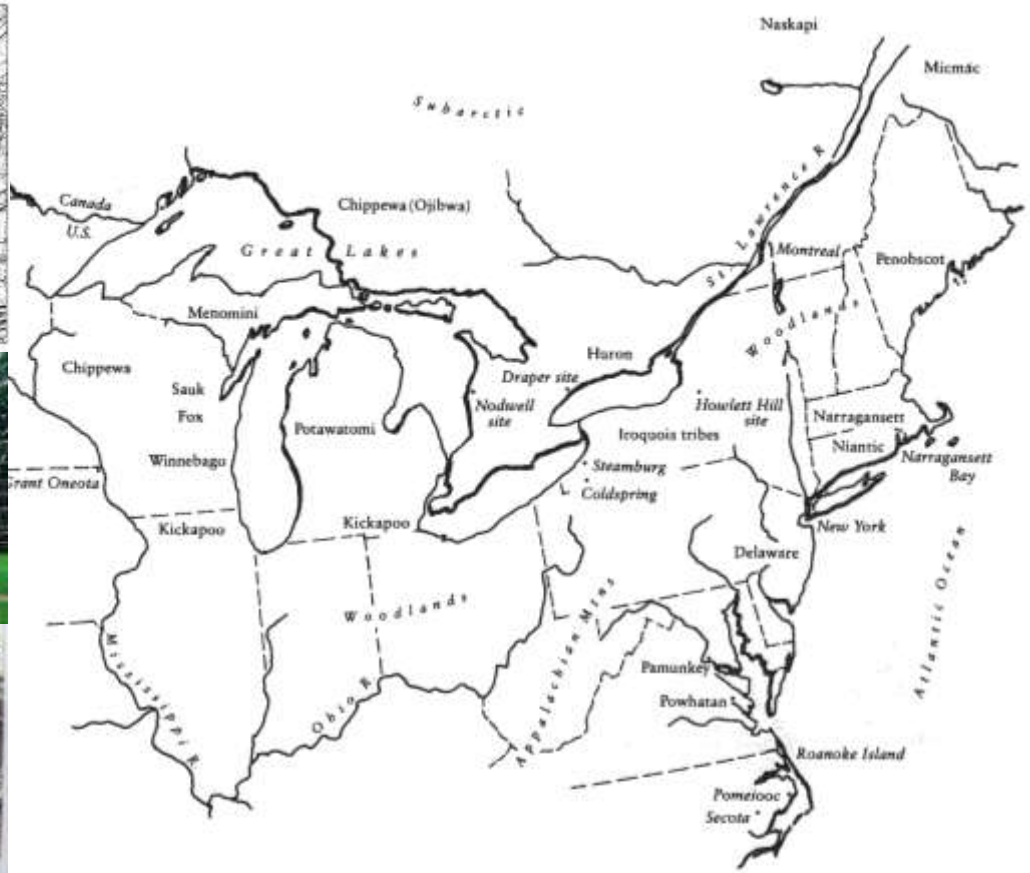
Ecology:
Prairie

Materials:
Timber, sod, grass, hide, canvas, earth

Building Types:
Earthlodge, grass house, tipi

Cultures include:
Assiniboine, Crow, Dakota, Hidatsa Mandan, Osage, Arapaho, Blackfeet, Cheyenne, Kiowa





Northeast

Climate:
Temperate

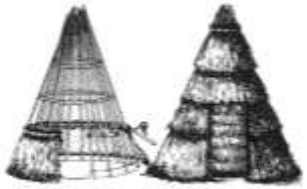
Ecology:
Woodlands

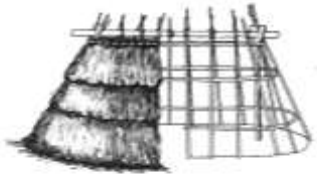
Materials:
Saplings, birch and elm bark, sinew, reed

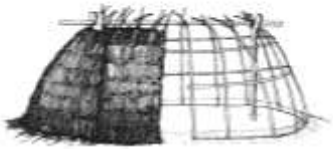
Building Type:
Wigwam, longhouse, subarctic tipi

Cultures include:
Penobscot, Chippewa, Sauk, Menominee, Huron, Iroquois, Mohawk, Oneida

California







California diversity

The California region contained the widest variety of native languages, ecological settings, and house types of any North American culture area. The oldest illustration *(above)* of California Indian life, engraved by Theodore de Bry in 1599, depicts a conical lodge of the coastal Miwok, with a central fire and earth banking. The Wintu Indian pit house village *(below)* with its acorn caches was located near Redding, was drawn by Henry B. Brown in 1852.

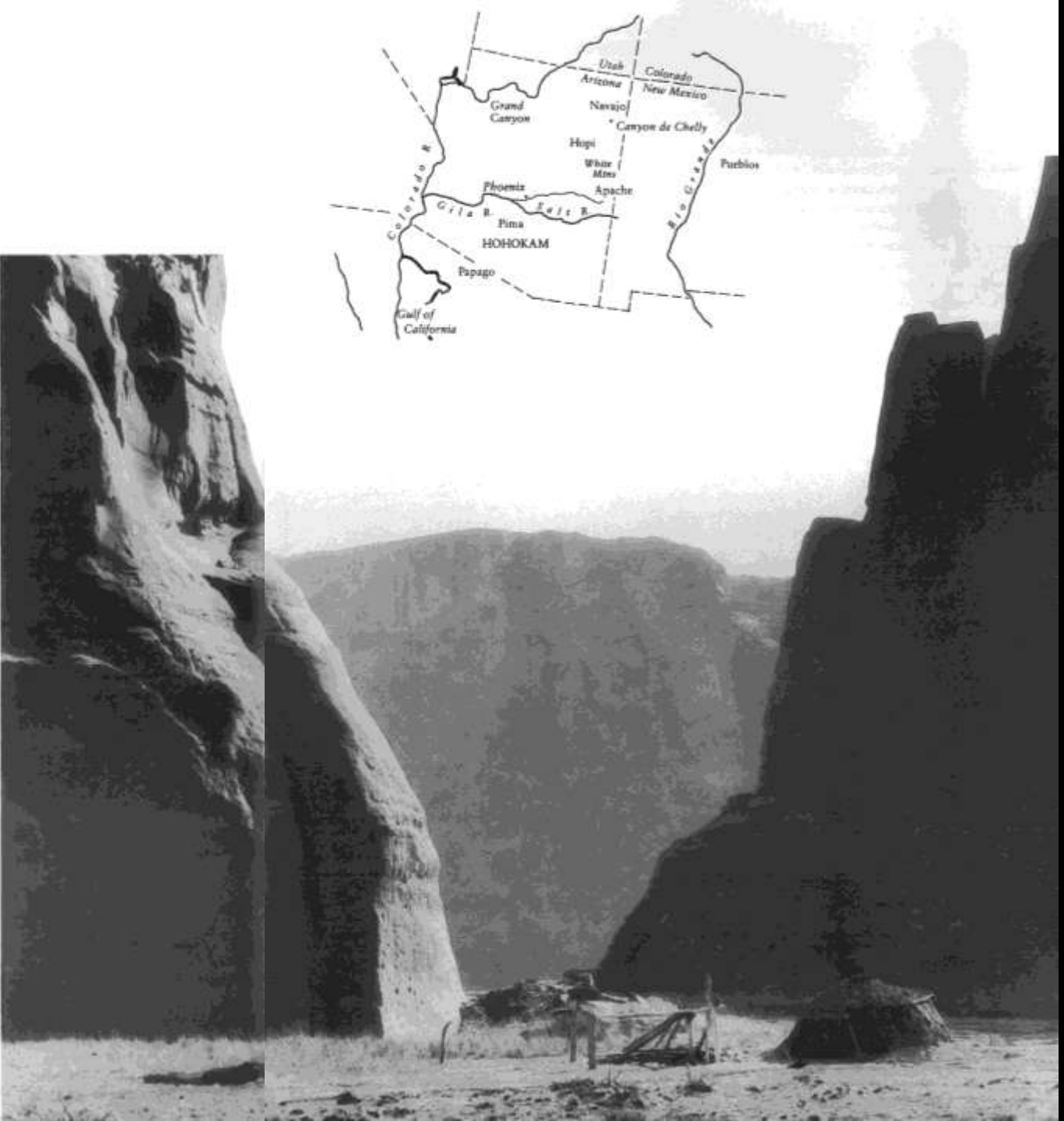
Climate:
Temperate, subtropical

Ecology:
Forest, mountains, valley, desert

Materials:
Redwood timber and planks, earth, saplings, brush, reed

Building Types:
Plank House, earthlodge, wikiup, bark tipi

Cultures include:
Hupa, Pomo, Serrano, Modoc, Nomlaki, Yuki, Havasupai, Maricopa, Bannock, Shoshone



Southwest I

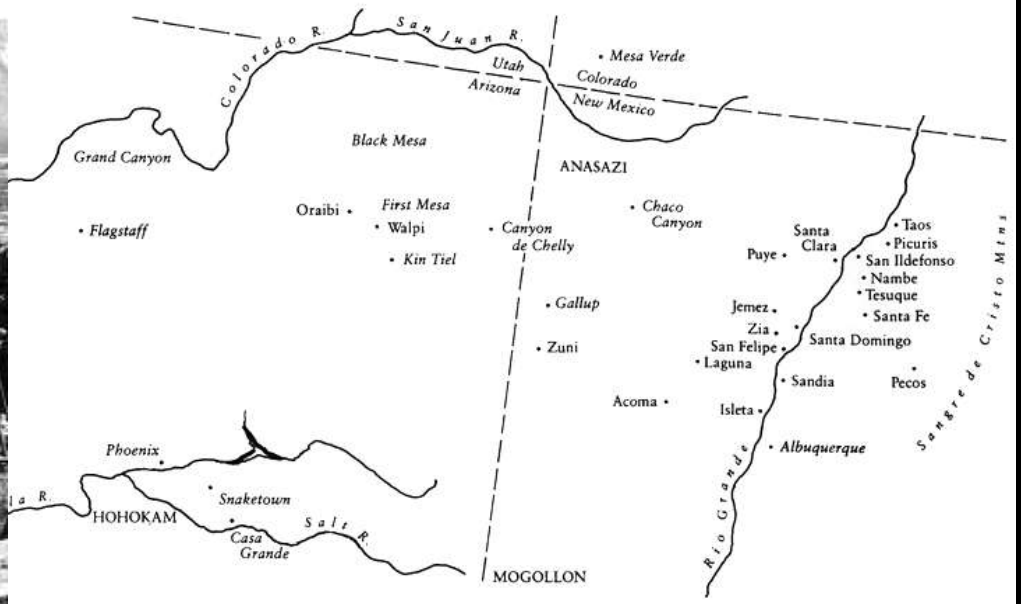
Climate:
Hot arid

Ecology:
Desert, valley, rivers

Materials:
Adobe, timber, brush

Building Type:
Hogan, wikiup, ki, ramada

Cultures include:
Navajo, Apache, Pima, Tohono O'Odham



Southwest II

Climate:
Hot arid

Region:
Desert , valley, rivers

Materials:
Adobe, stone, timber, brush

Building Type:
Pueblo, kiva

Cultures include:
Pueblo, Zuni, Hopi, Yaqui, Tahono O'odham, Pima

Southeast

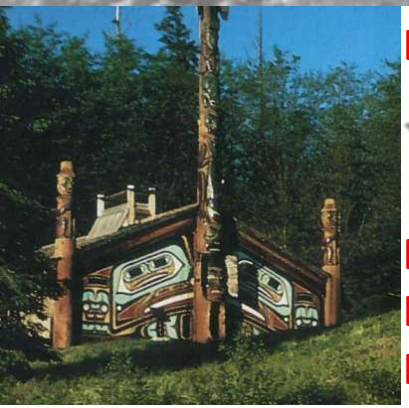
Climate:
Sub tropical

Ecology:
Subtropical woodlands, tropical

Materials:
Saplings, wattle-and-daub, palmetto, thatch

Building Type:
Town house, chickee

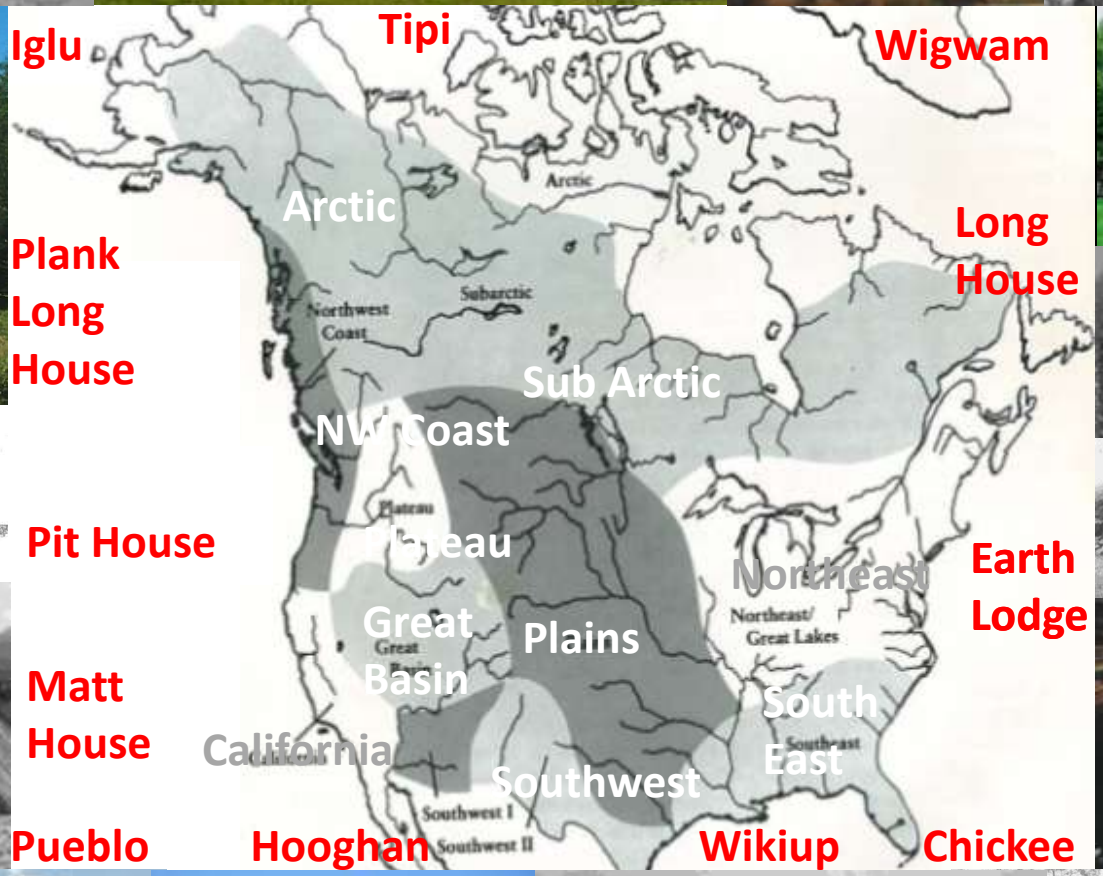
Cultures include:
Chickasaw, Choctaw, Seminole, Creek, Cherokee



Iglu

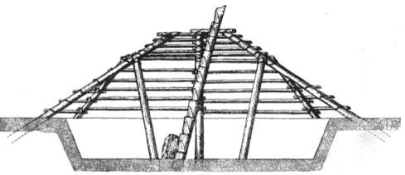
Tipi

Wigwam



Plank Long House

Long House



Pit House

Earth Lodge

Matt House

Pueblo

Hooghan

Wikiup

Chickee

1970

Arctic
Arctic
Northwest Coast
Subarctic
Sub Arctic
NW Coast
Plateau
Northeast
Great Plains
Great Basin
Plains
Northeast/ Great Lakes
Southeast
California
Southwest
California
Southeast
Southwest I
Southwest II

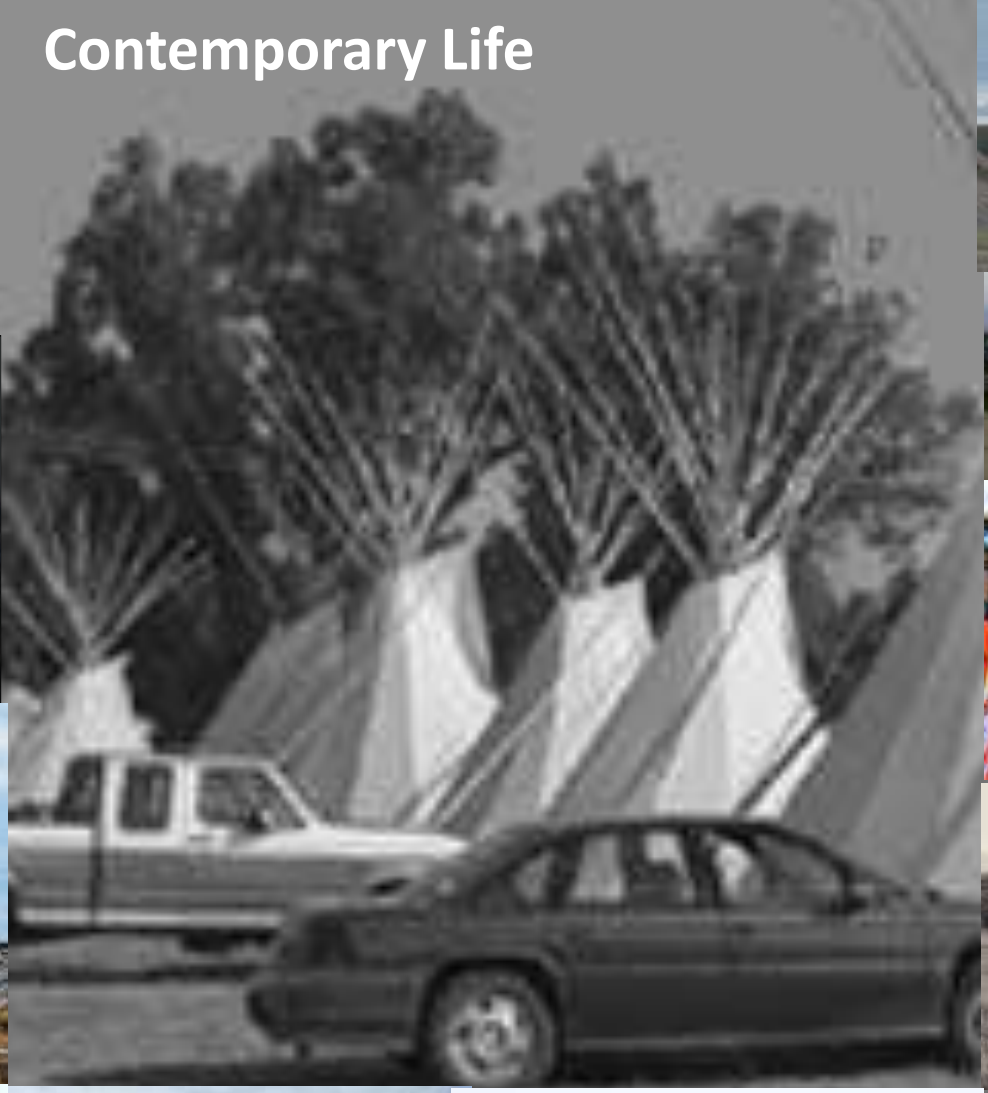
Diversity

SHOSHONI
CHEYENNE
APACHE
OSAGE
CHOCTAW
CREEK
NAVAJO
COMANCHE

Apsaalooke (Crow)
People of the Large Beaked Bird

Uniformity

Contemporary Life

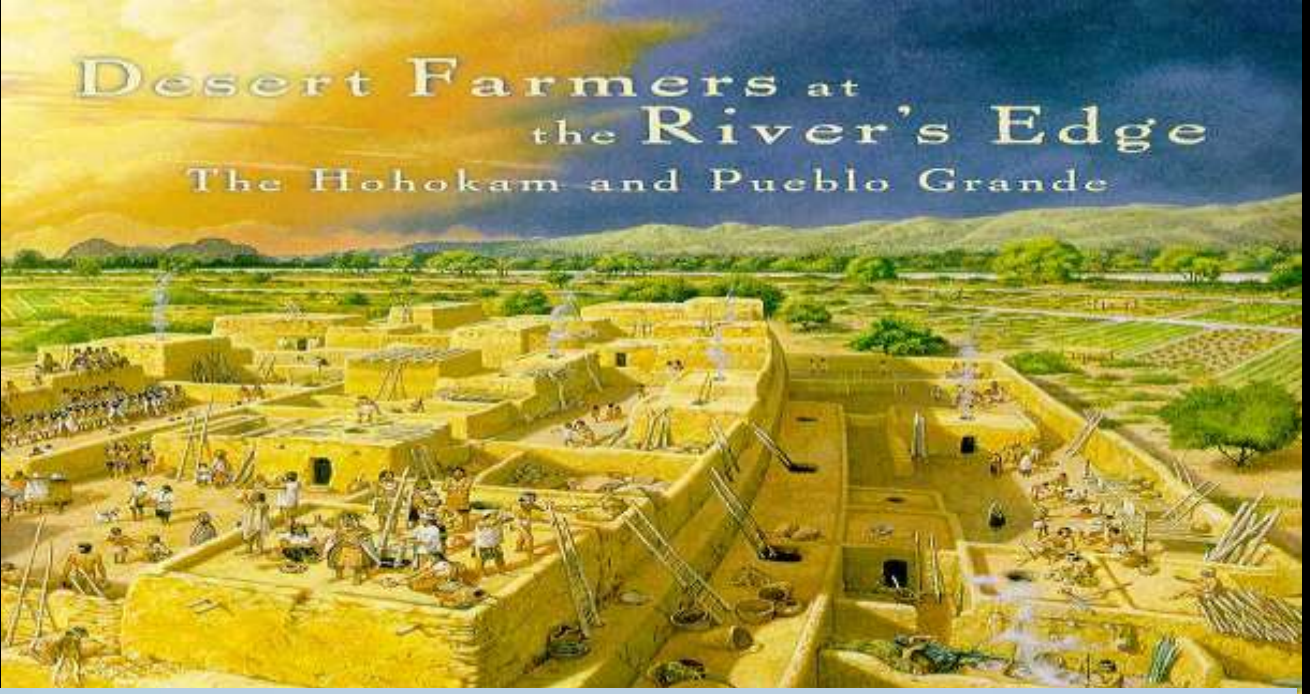


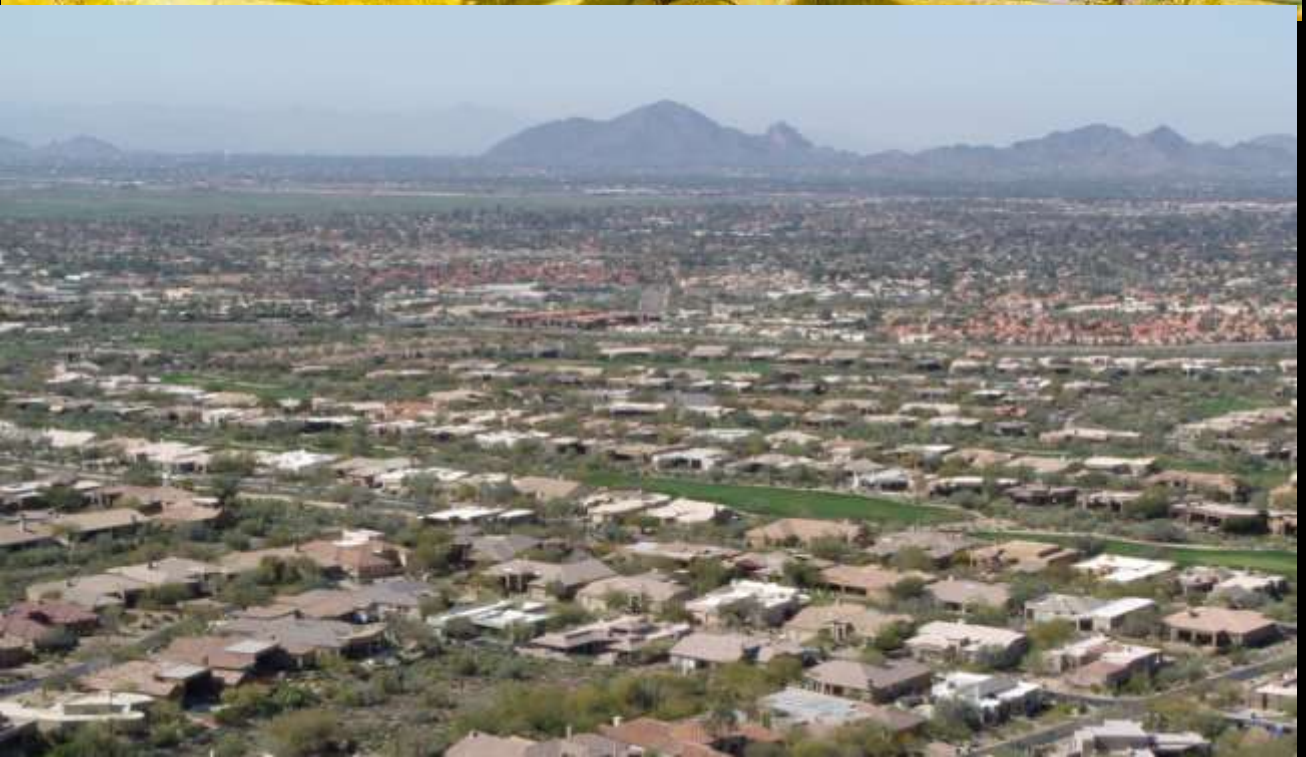
Subdivision:

Crow Agency, Montana
Crow Reservation

Subdivision:

Crownpoint, New Mexico Navajo Reservation





Phoenix, AZ

1200

Compact , multi-use development preserved open space for agriculture, local renewable and massive materials suited to desert climate

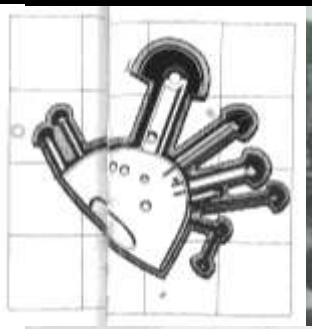
2012

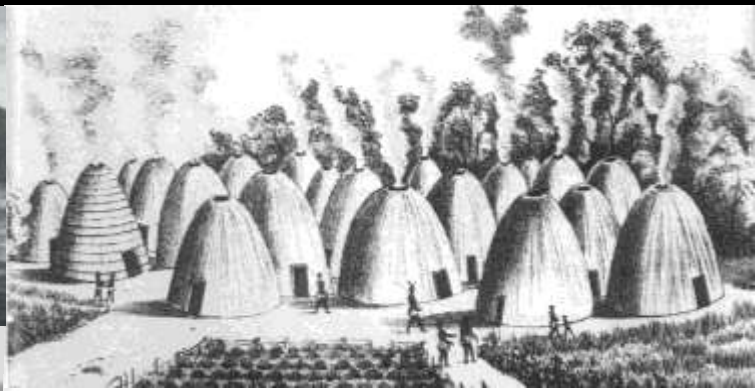
Low-density suburban sprawl, separation of uses, urban heat island effect , loss of agricultural land, non-local materials unsuitable to desert

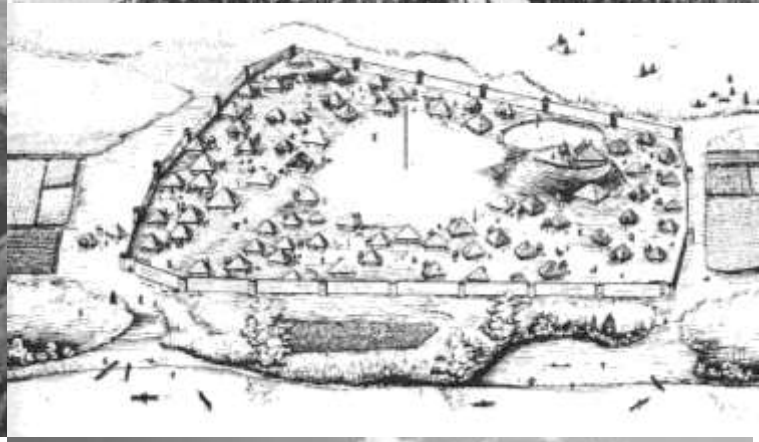
- There are over 76 million residential and 5 million commercial buildings in the U.S.
- Collectively, these buildings consume:
  - *65% of electricity and 37% of primary energy*
  - *25% of all water supplies and 30% of all wood & materials*
- Collectively, these buildings generate:
  - *35% of solid waste*
  - *36% of CO2 and 46% of SO2 emissions*
  - *19% of NOx and 10% of fine particulate emissions*

(LEED US Green Building Council)

Community: Clustered communities minimize impact on the landscape, create strong social integration, integrate gathering space with dwelling, integrate work, play, learning, ceremony together.

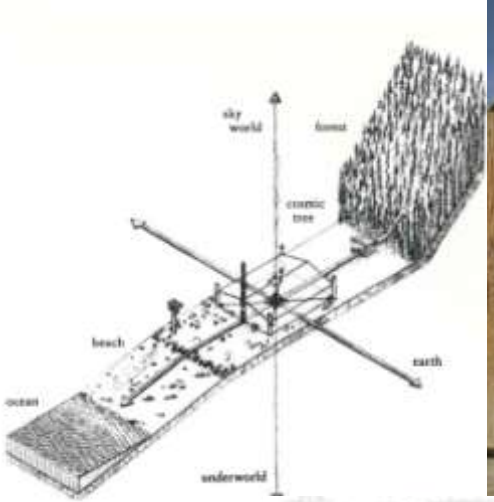


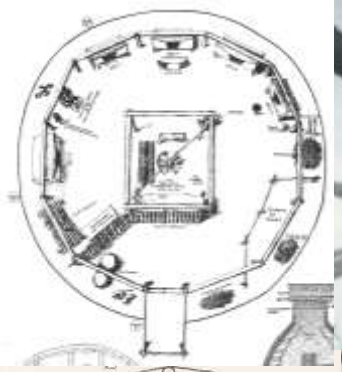


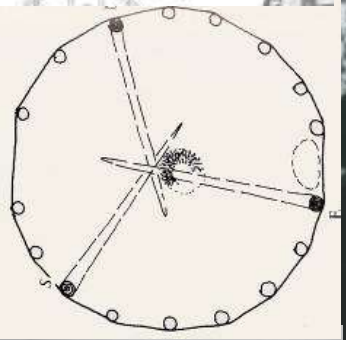


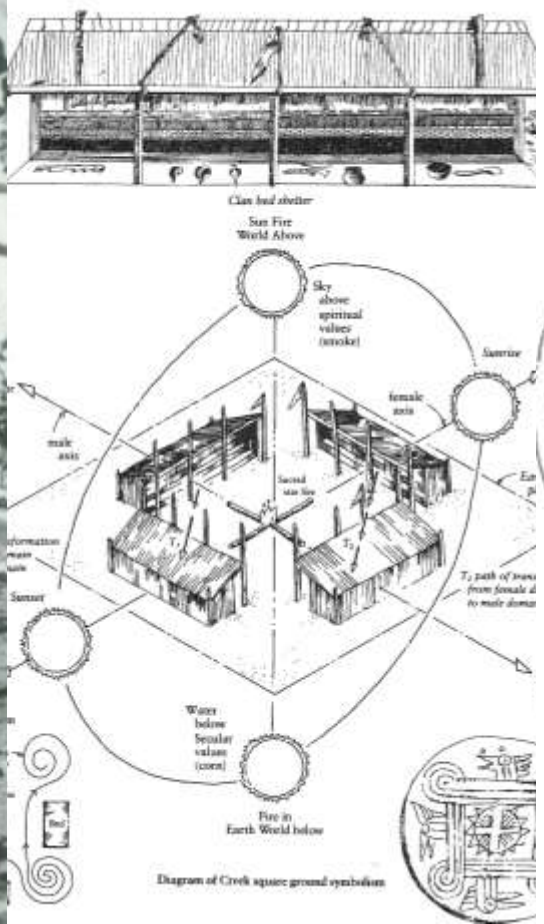
Culture:

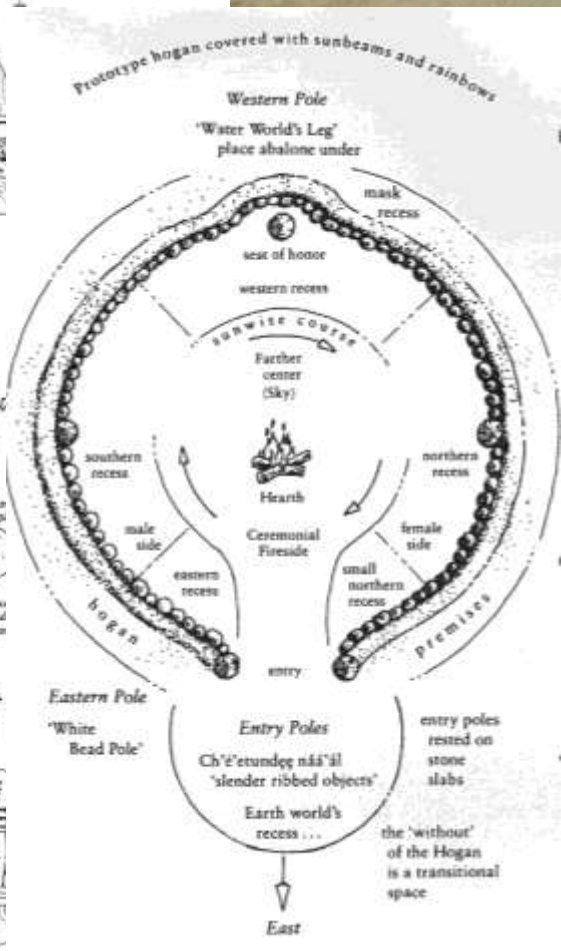
Cosmology, seven directions, eastern entry, the sacred circle, ceremonial spaces and structures, spirituality, solstices, numerology, sacred plants….











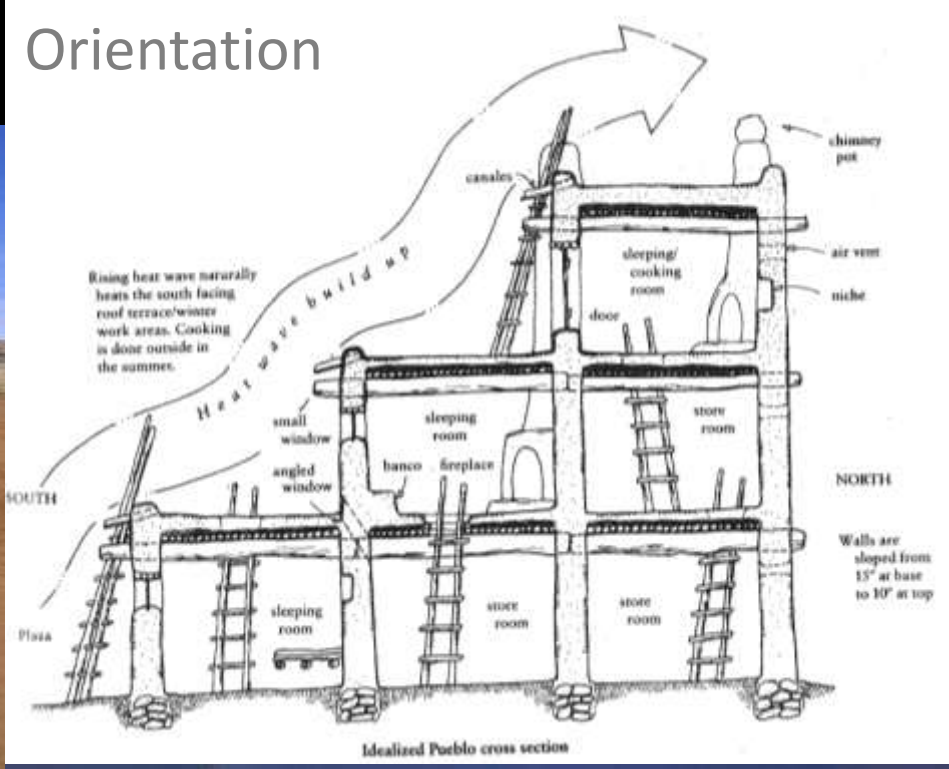
Culture: Expression

Climate: Hot / Dry

Earth

Mass

Orientation



Idealized Pueblo cross section

Shade / Ventilation

Climate: Hot / Humid

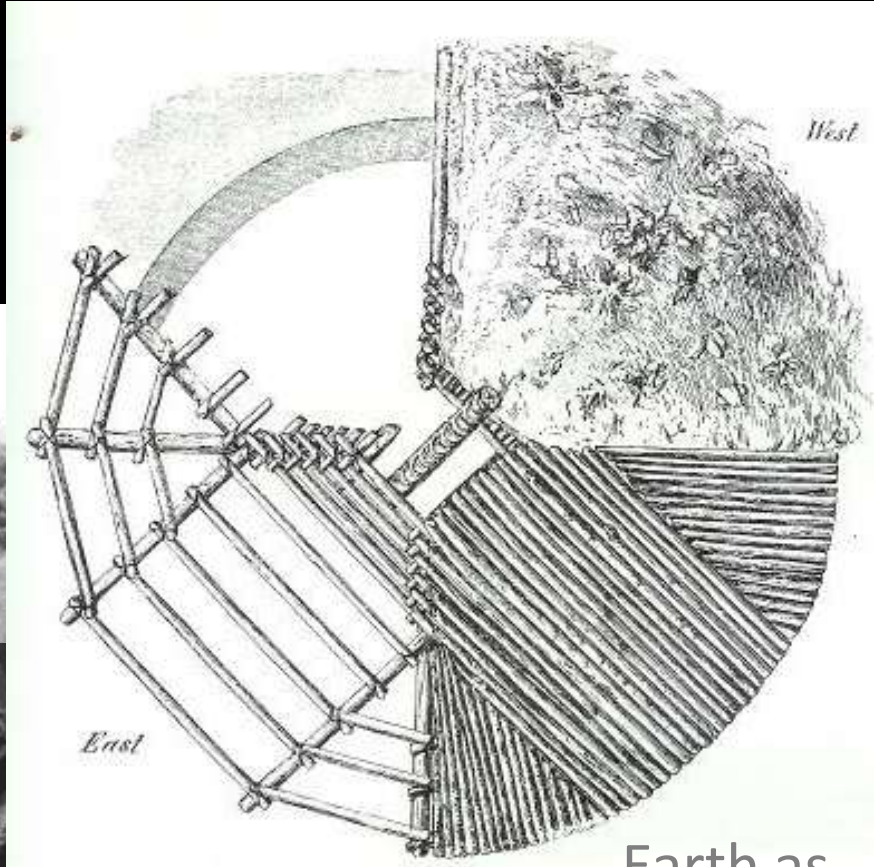
Shade / Ventilation / Elevated structures

Energy

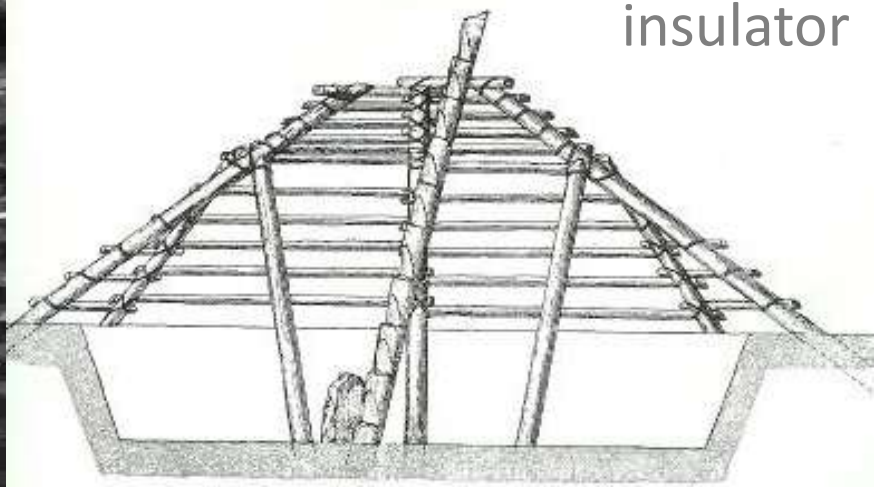
Daylight

Green roof

Compact spaces / thick walls



Earth as insulator

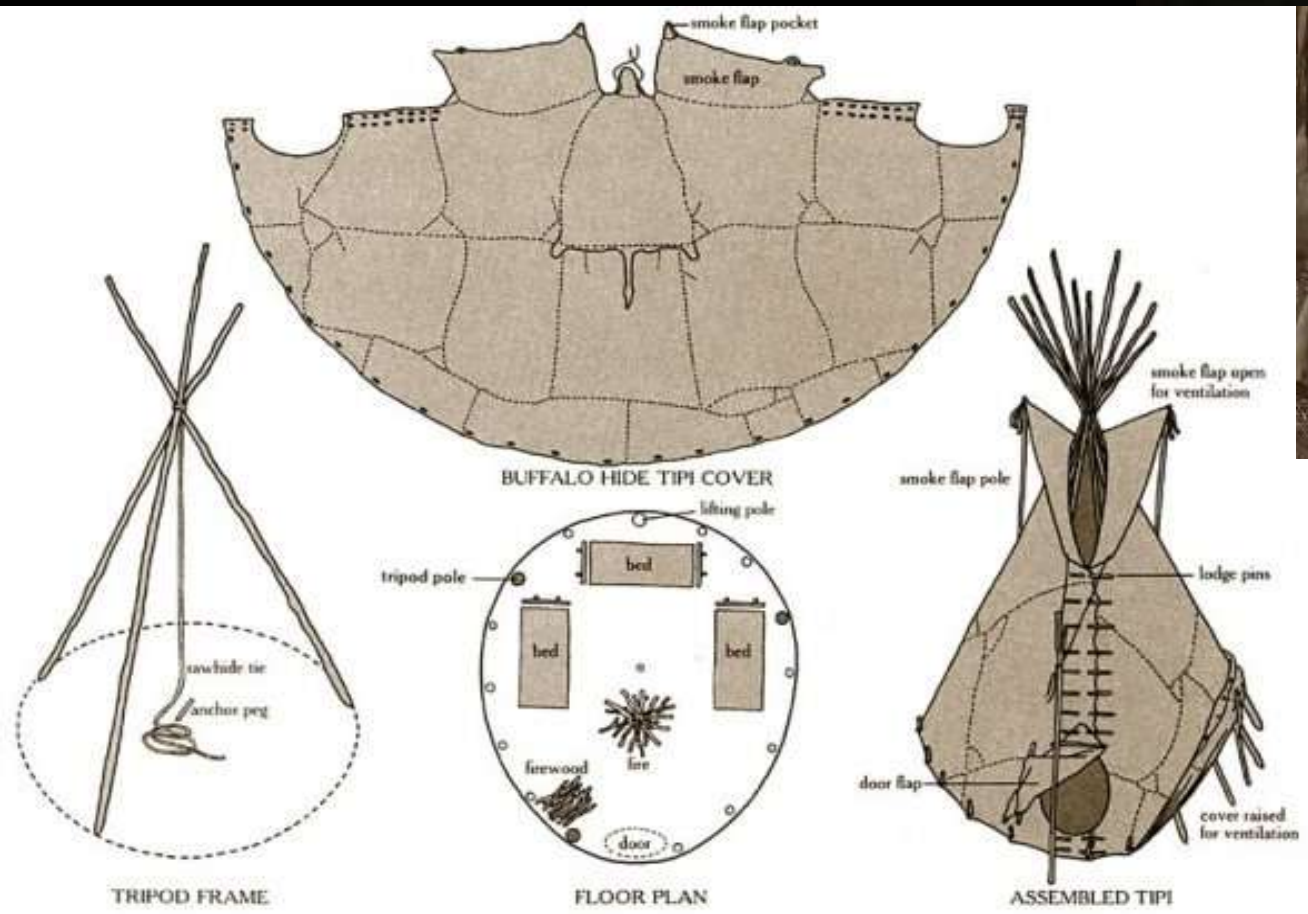


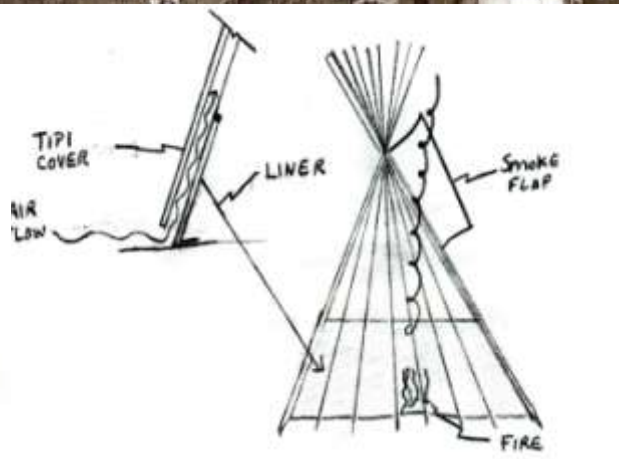
Tipi Technology

Canvas

Sustainability defined: do more with less

Buffalo hide





Climate Response:

Dynamic Structure responds to climate extremes – hot summers / cold winters:

"In the winter, our villages stood on low, sheltered ground near the river, where the wind and cold could not reach us; in summer they were moved to higher ground where they could catch the cool winds."

The Arapaho Way
Althea Bass

Summer Condition –

Shade / ventilation / open location to catch prevailing breezes

Winter Condition –

Double wall insulation / central heat / sheltered location

Traditional Native American Architecture's Relevance to Today's Tribal Communities

Integrative Design

Holistic designs which respond to climate, culture and place

Location

Choosing locations that preserve the natural landscape, protect habit, and provide beneficial micro-climates

Site

Minimizing the impact on the land, integration of uses, clustered communities, walkability

Water

Conservation, collection and utilization of rainwater, retaining the natural landscape

Energy Efficiency

Small, efficient designs requiring minimal renewable heat source, natural ventilation, passive solar gain, solar/wind orientation, shading devices, utilization of wind for cooling, use of the earth's natural cycles

Traditional Native American Architecture's Relevance to Today's Tribal Communities

Materials Beneficial to the Environment

Local, renewable resources: wood, earth, fiber, hide, stone
Re-use of

Healthy Living Environment

Non-toxic materials, natural ventilation, indoor/outdoor living, exercise integrated into daily life, healthy locally grown non-toxic food source,

Operations and Maintenance

Efficient simplicity, readily replaceable materials, durability, replicable parts, modular design

CULTURE

Community Process

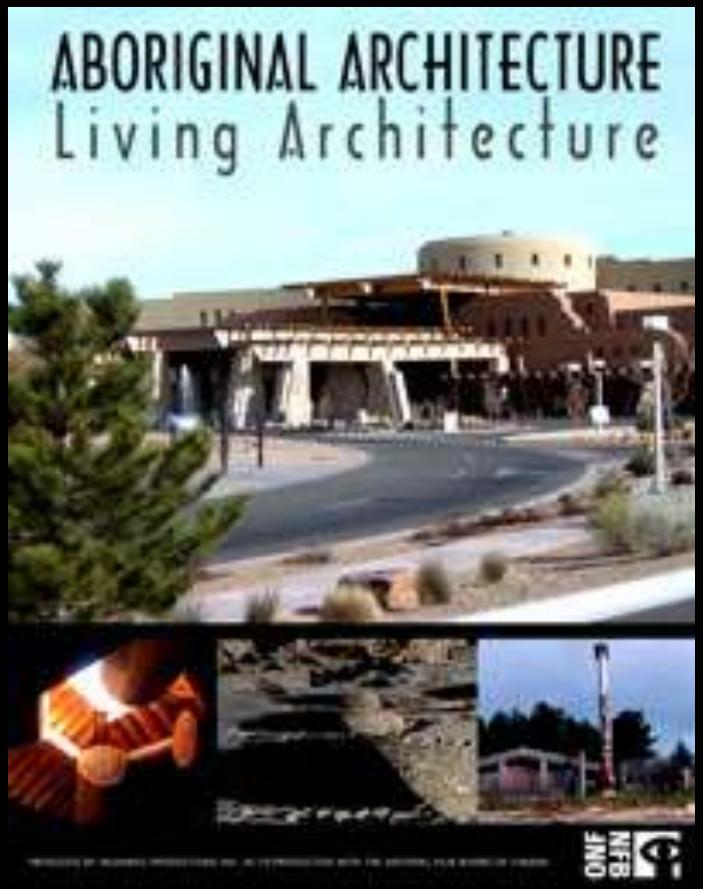
CLIMATE

Design w/ Climate

A R C H I T E C T U R E

&

P L A N N I N G



Aboriginal Architecture
Living Architecture

New structures in seven North American Native communities that reinterpret traditional forms for contemporary purposes.

93 minutes

Directed by Paul M. Rickard

Produced by Mushkeg Productions Inc. and the Native Film Board of Canada