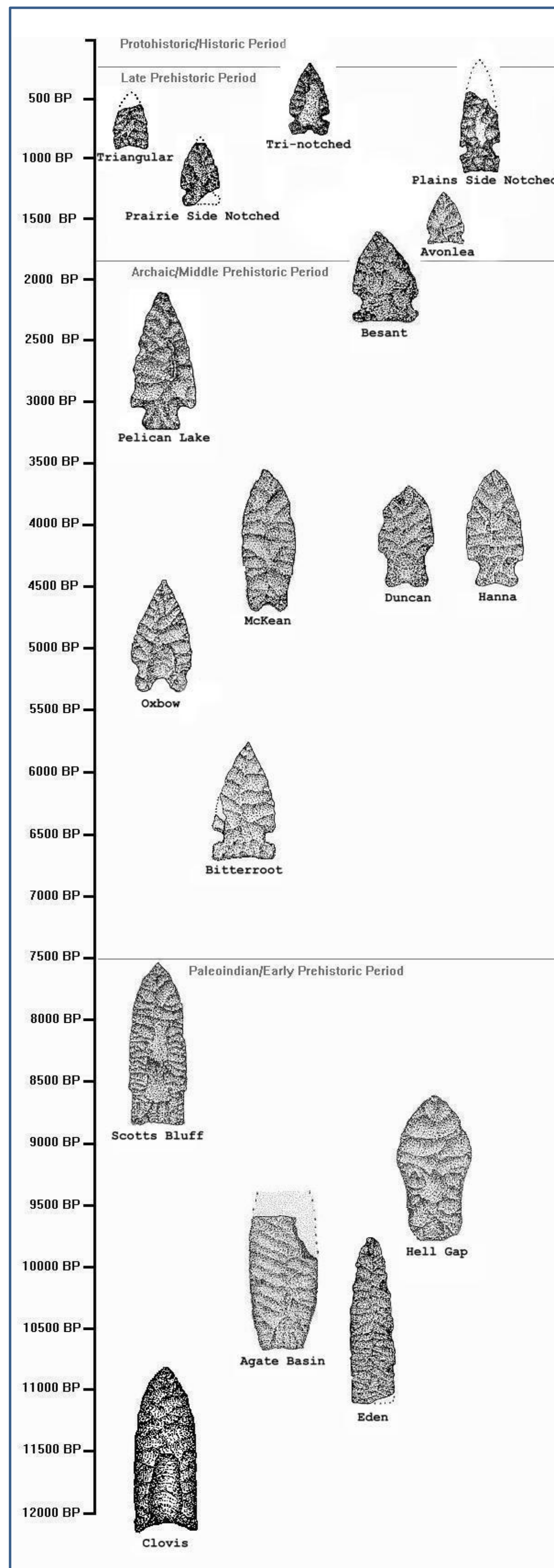


Construction of a Projectile Point Classification For the Northwestern Plains Through a Knowledge Elicitation Protocol Utilizing a Computer-Based Anonymous Decision Tool, "SIGGI-AACS"

By E.S. Lohse, D.Sammons, C. Schou, K. Turley-Ames, K. Lohse and C. Moser

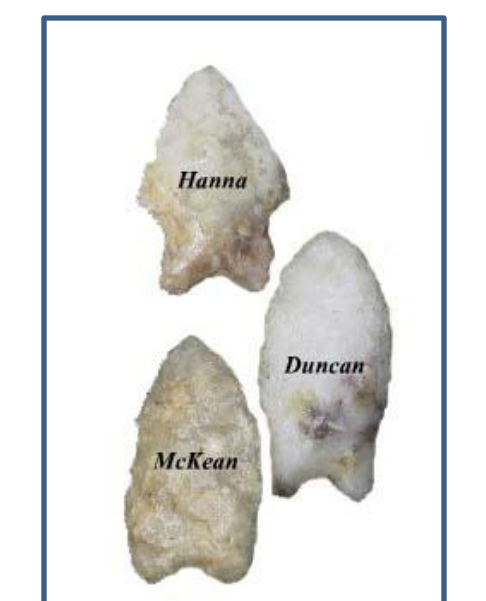


This project is a unique collaboration among researchers in archaeology, psychology, informatics, and education. It proposes to create a projectile point typology for the Northwestern Plains of North America by eliciting knowledge from expert archaeologists through a computer-based anonymous collaboration and decision tool, as those experts interact with each other and with an artificial intelligence (AI) that is an automated expert classification system. The project has a number of significant outcomes:

- The project will refine a new typology for projectile point typologies from the Northwestern Plains.
- This typology will result from the consensus of human experts, from the automatic classification of projectile points by the automated expert system (known as "SIGGI"; see Lohse, various), and from the interaction between the human and automated experts.
- The project will pilot the use of knowledge elicitation protocols in both expert-expert and expert-SIGGI interactions.
- The project will pilot the use of knowledge elicitation protocols in an archaeological context.
- The project will pilot the use of the Simplot Decision Support Center (SDSC) as the appropriate facility for the knowledge elicitation exercise and as a venue for social science research.
- The project will produce an on-line research and learning tool that allows other researchers, land managers, and the general public, and land managers to access and use the Northwestern Plains typology, as well as other SIGGI typologies.

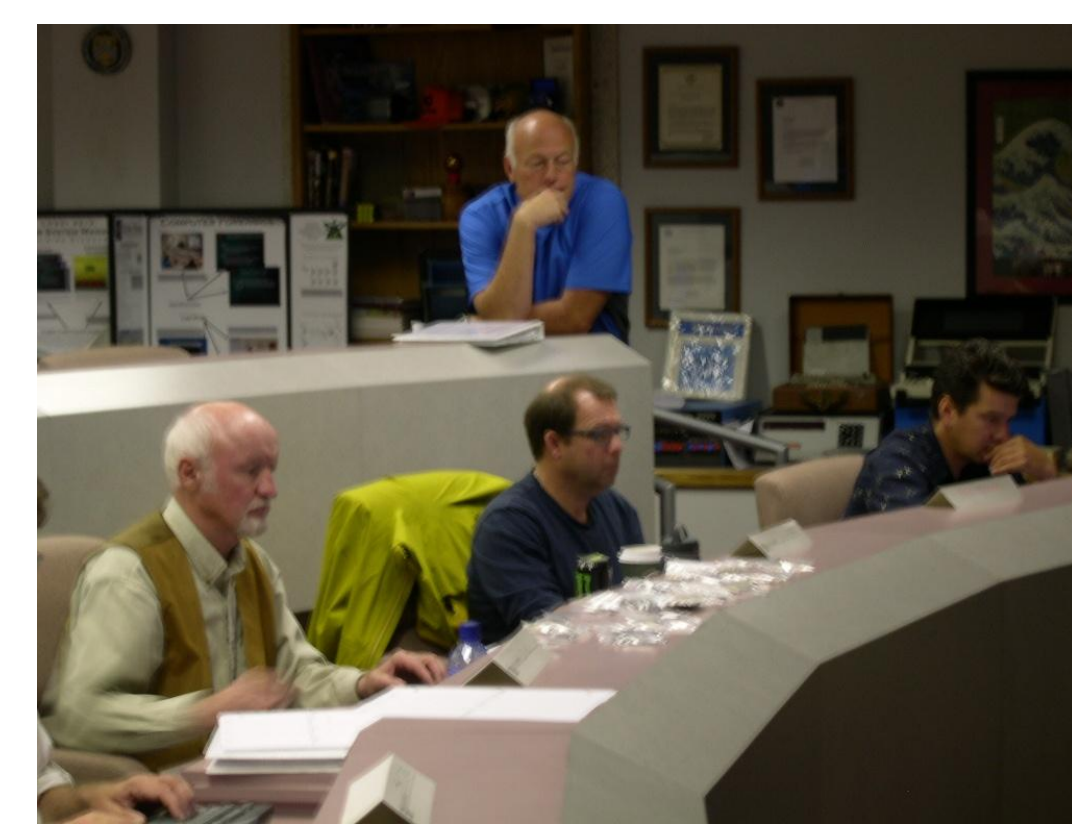
Bringing archaeological experts together in a research conference to train SIGGI to apply the Northwestern Plains classification system presents challenges. Using a neural agent also promises potential for recognizing and resolving issues and problems in culture area classification as in definition of types and type series.

Issues and Problems: Types Or Series? Duncan-Hanna-McKean example

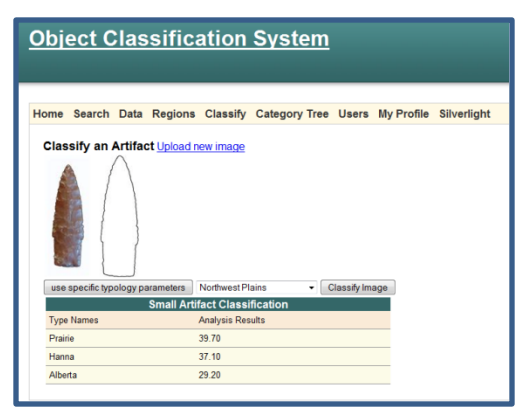
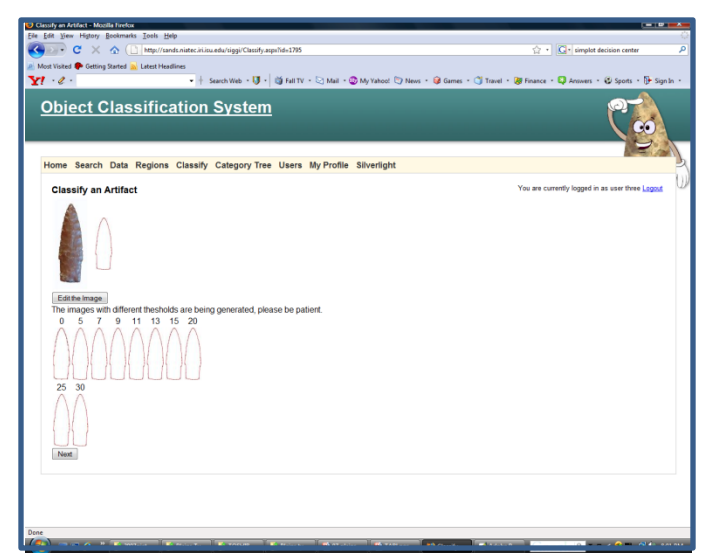


Dates: 5000 to 3500 yr BP
Lithics: Lithic raw material was mainly local although exotic material does occur. There are three distinctive point types associated with this phase: McKean, Duncan and Hanna. McKean and Duncan are basally notched while Hanna are corner and basally notched. The exact relationship between these points is still unclear.
McKean Complex DEFINITION: A Middle Plains [archaic complex](#) dating to c 5000-3000 BC and occupying parts of the northwestern Plains of North America. Its [type site](#) is in northeast Wyoming and has a McKean [projectile point](#) -- a stemmed, [lanceolate form](#).

Simplot Decision Center, Idaho State University
http://www.isu.edu/research/facilitiesubs/simplot_decision_center.shtml



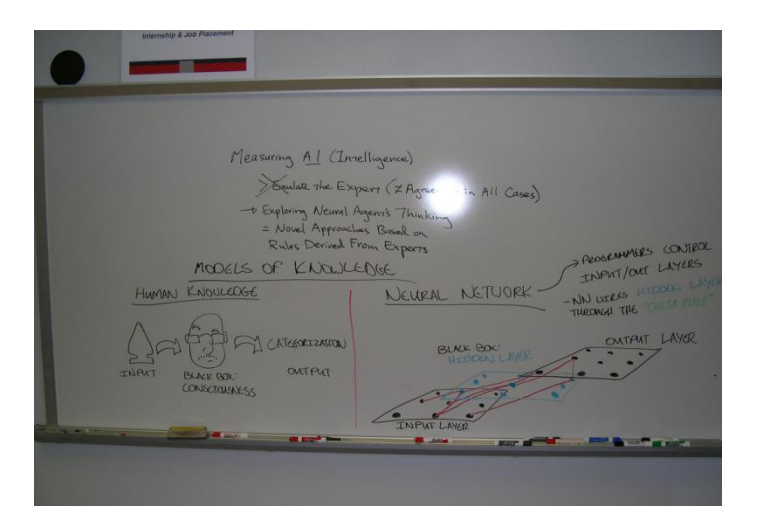
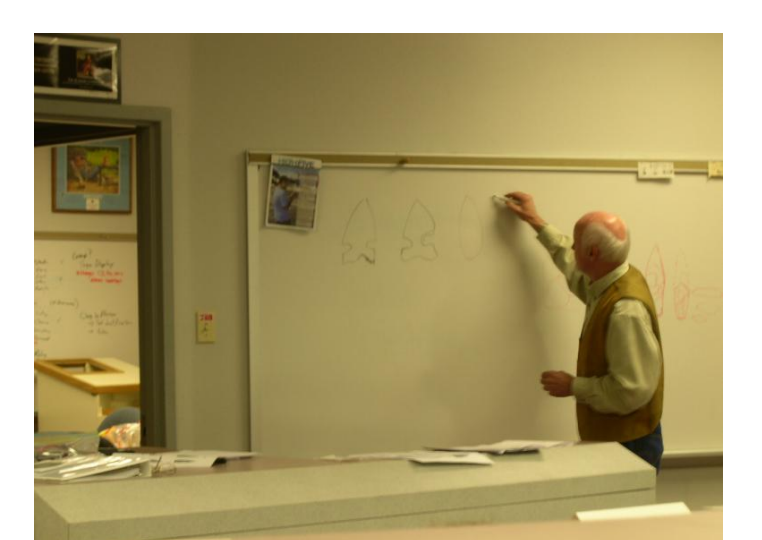
Chuck, Ken and Paul are tough critics: no pleasing these guys.



Experts interact with SIGGI by picking the "best" computer-generated outline for a specimen. This is classified to type and vector scores given.



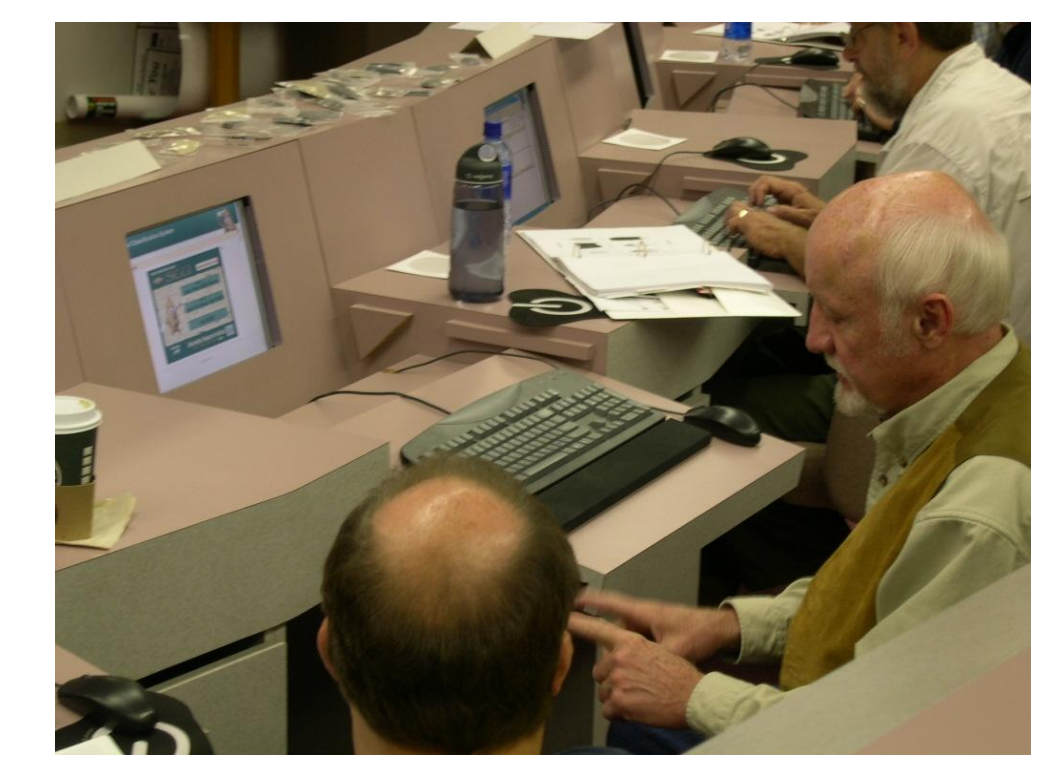
The Team mugshot: left to right: Ian Dyck, Dale Walde, Chuck Reher, Ken Cannon, Keith Lohse, Paul Santarone, Skip Lohse, Jack Ives, Kandi Turley-Ames, Jim Frost.



Sketching ideas for SIGGI



Ken Cannon does his homework: Type catalog for training needs weeding.



Chuck Reher knows what he wants.

Sliding Scale of Alberta acceptance

Description: Question: 10 is a great match, 1 is not a match at all We seek those A.Hs that are troublesome to describe. You are provided a sheet of projectile point images, which image fits the description of Alberta?

Evaluation Source
The evaluation was executed against root level folders.

Criteria Source
No criteria selected

Question / Description
10 is a great match, 1 is not a match at all We seek those A.Hs that are troublesome to describe. You are provided a sheet of projectile point images, which image fits the description of Alberta?

Evaluation Charts

Results Summary												
No criteria selected												Total
	1	2	3	4	5	6	7	8	9	10	Average	STD
cody100-1	0	0	0	0	0	0	1	2	2	8	6.7	1.21
cody100-6	1	0	0	0	0	0	1	2	2	7.83	3.43	47
cody100-2	0	0	0	0	0	0	1	1	1	7.5	1.52	45
cody100-5	1	0	0	0	0	1	1	1	1	6.83	3.19	41
cody100-3	1	0	1	0	0	0	1	0	1	5.67	3.27	34

User Vote Detail

SLIDING SCALE #2 of Agate Basin

Description: Question: 10 is a great match, 1 is not a match at all We seek those A.Hs that are troublesome to describe. You are provided a sheet of projectile point images, which image fits the description of Agate Basin?

Evaluation Source
The evaluation was executed against root level folders.

Criteria Source
No criteria selected

Question / Description
10 is a great match, 1 is not a match at all We seek those A.Hs that are troublesome to describe. You are provided a sheet of projectile point images, which image fits the description of Agate Basin?

Evaluation Charts

Results Summary												
Agate Basin												Total
	1	2	3	4	5	6	7	8	9	10	Average	STD
Agate Basin 102	0	0	0	0	1	1	0	1	3	8	6.7	1.75
Agate Basin Unnumbered 3-01	1	0	0	0	0	0	0	1	4	8.33	3.61	50
Agatebasin03 copy	0	1	0	0	0	0	0	2	3	8.33	3.14	50
Agate Basin Unnumbered 4-01	1	0	0	0	0	1	0	1	3	7.83	3.54	47
Agatebasin01	1	0	0	0	1	1	1	2	7.5	3.39	45	
Agate Basin Unnamed 2-01	1	0	0	1	0	0	2	2	7.33	3.61	44	
Agatebasin02	1	0	0	0	1	2	1	1	7.17	3.19	43	
Agate Basin Unnamed 1-01	1	0	1	0	0	0	1	0	2	6.4	4.16	32

User Vote Detail

Use of the SDSC allows tracking of expert interactions with SIGGI. Coding these transcripts allows finer understanding of how experts classify points, which in turn allows better training of SIGGI.

This research was supported by an Idaho State University Humanities and Social Science Research Committee award, an Idaho State University Faculty Research award, And with support from the Informatics Research Center, Idaho State University.