
LA PALMA REPRESO AZULITOS
BISBEE LA MESA REPRESO
ALTAR CINTURA ESCALANTE
PICACHOS EL CHANATE CHINO
ANTUNEZ CAMAS MESA QUEMADA
CERRO SAN LUIS TULITO DURAN
LOS TANQUES LOS TUBOS NOGAL
COCOSPERA MORITA LA BEBELAMA
LISTA BLANCA EL AMOL MURAL
ARROYO SASABE BACUCHI
CHUPURRATE ARIVECHI ANITA
TUAPE AGUILA CEJA SAHUARO
EL MACHO CALOSO POZO DURO
EL CUMARO CERRO DE ORO
CABULLONA PACKARD PICACHOS

Problemática

- Gran cantidad de nombres
- Sinonimia
- Homonimia
- Procedimientos y formas inadecuadas para: asignación y abandono de nombres, cambios en contenido, rango, etc.

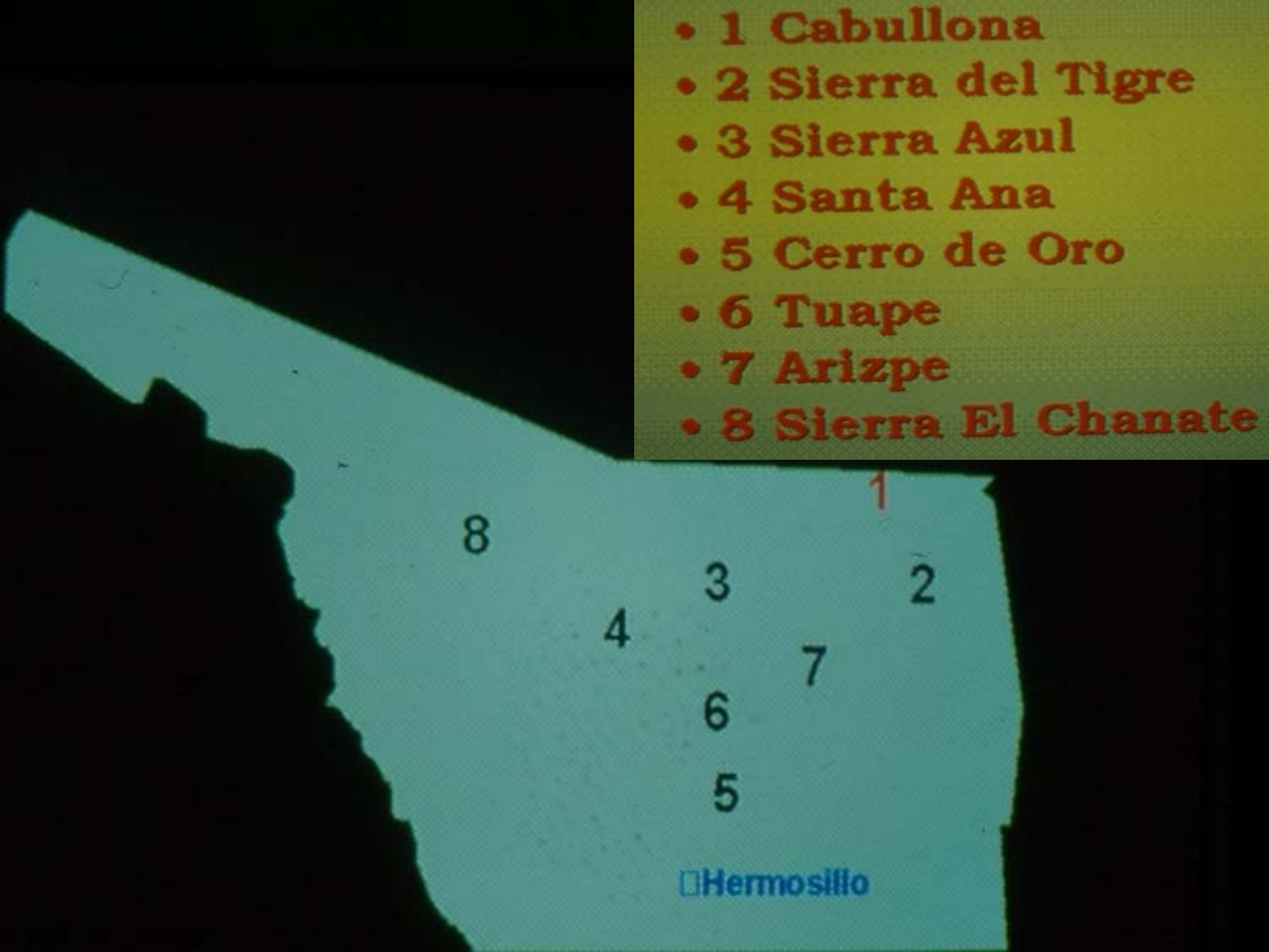
EL USO DE NOMECLATURA ERRONEA

PROBLEMAS

- CORRELACIONES
- ANALISIS DE FAÇIES
- ANALISIS DE CUENCAS
- RECONSTRUCCIONES PALEOGEOGRAFICAS

- REDEFINICION
- REVISION
- ABANDONO

DE UNIDADES
ESTRATIGRAFICAS


• 1 Cabullona
• 2 Sierra del Tigre
• 3 Sierra Azul
• 4 Santa Ana
• 5 Cerro de Oro
• 6 Tuape
• 7 Arizpe
• 8 Sierra El Chanate
1
2
3
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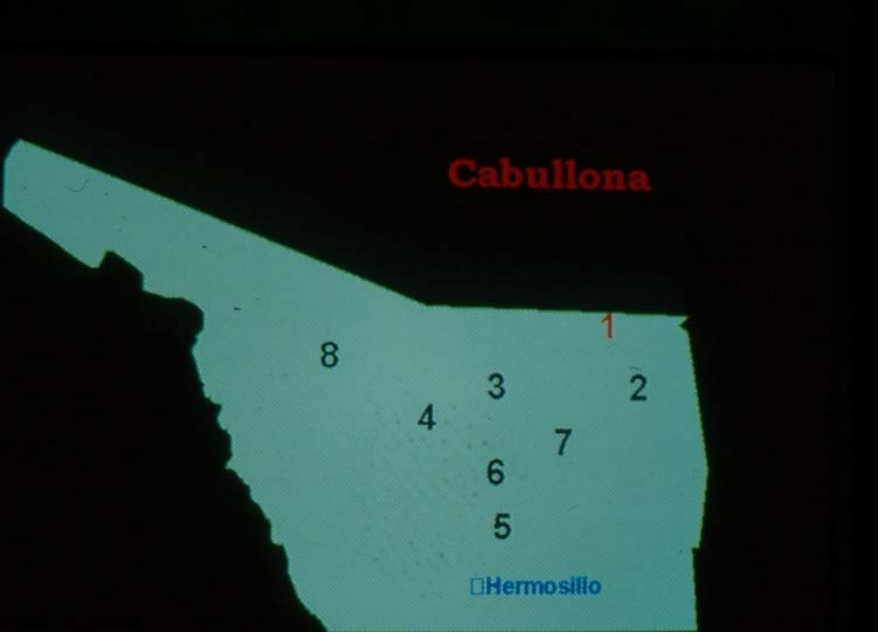
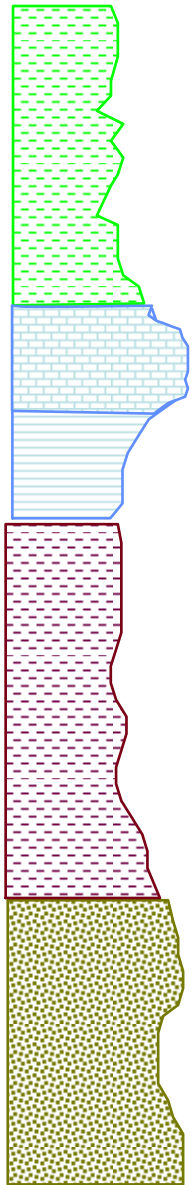
Hermosillo



Bisbee Group

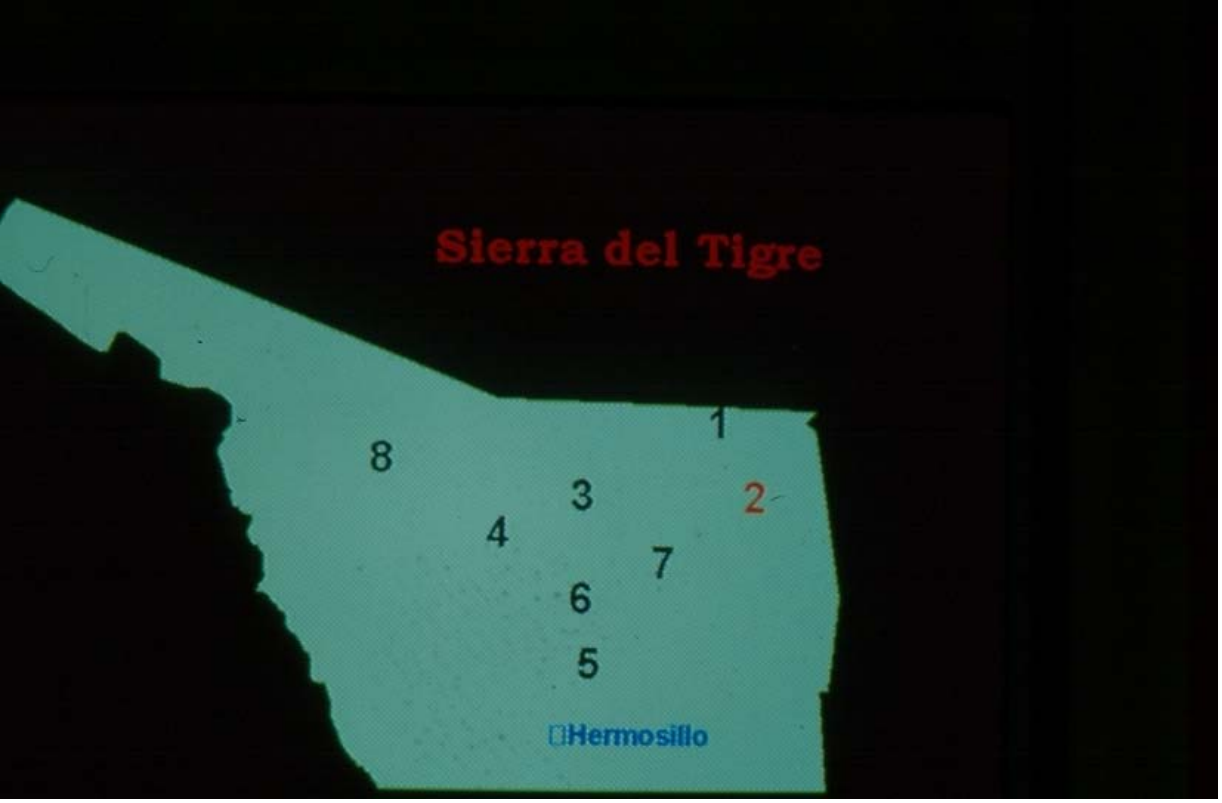


Cintura

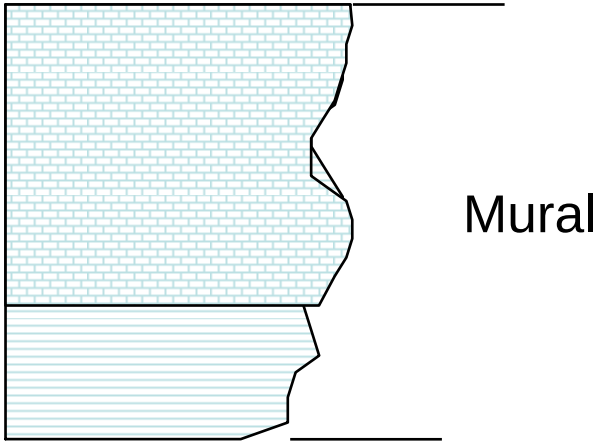
Mural

Morita

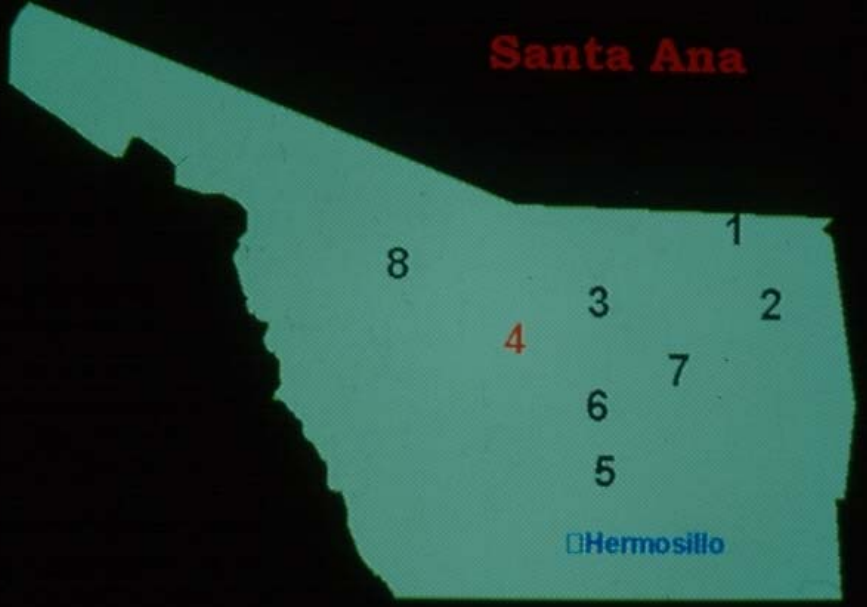
Glance



Sierra
El Tigre

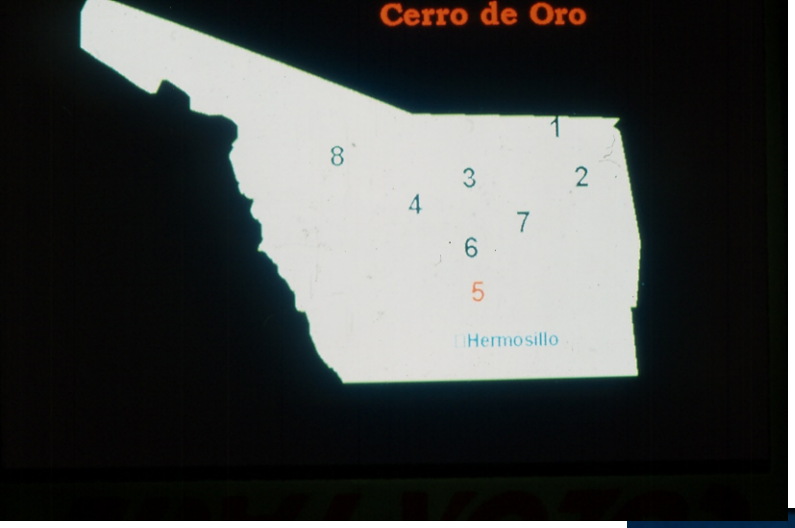


Mural



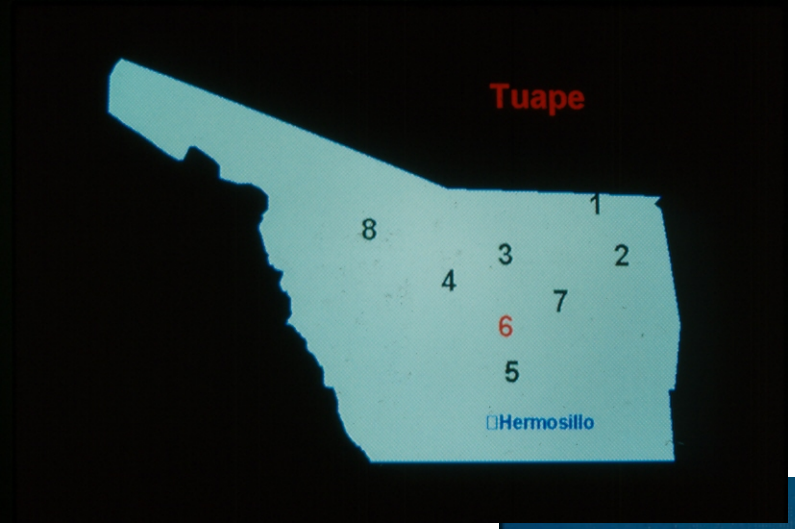
Santa Ana

Salas (1968)	Morales (1984)	Navarro y Tellez (1988)		Navarro (1989)		Jacques (1993)		This work	
						Pozo Duro Fm.			
		BISBEE GROUP	Cintura Fm.	BISBEE GROUP	Cintura Fm.	BISBEE GROUP	Cintura Fm.	BISBEE GROUP	Cintura Fm.
Represo Fm.	? Represo Fm. ?		Represo Fm.		Mural Fm.		Mural / Arroyo Sásabe		Mural Ls.
			Morita Fm.		Morita Fm.		Morita Fm.		Morita Fm.



Cerro de Oro

Castro & Morfin (1988)		González & Jacques (1988)		González & Lucas (1995) This work	
Cerro de Oro Group	Los Valles formation		La Palma Formation		La Palma Formation
	Antunes limestone	Bisbee Group	Cintura Formation	Bisbee Group	Cintura Formation
			Mural Formation		Mural Formation
	La Palma formation		Morita Formation		Morita Formation
			Cerro de Oro Formation		Cerro de Oro Formation

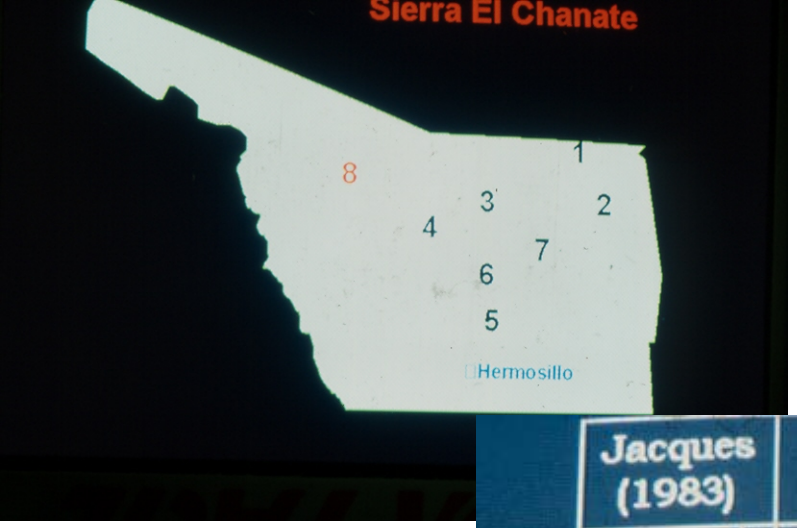


Tuape

Rodríguez (1984,1988, 1991)	This work	
Los Tanques formation	Bisbee Group	Mural Formation
Tuape formation		Morita Formation
Bacuchi formation		Cerro de Oro Formation

Arizpe

González (1978)				González & Jacques (1990)	This work	
Aguila conglomerate					Aguila congl.	
CEJA GROUP	Mesa Quemada	AZULITOS GROUP		Mesa Quemada	BISBEE GROUP	Cintura
	El Macho		Sahuaro	El Macho		Mural U
	Temporales		Nogalar	Temporales		Mural L
						Morita
						Cerro de Oro



Jacques (1983)		Jacques (1986)		Jacques & others (1987,1988)		Jacques (1989)		Jacques (1993)		This work	
El Charro formation	U L	El Charro formation	U L	El Charro formation	U L	El Charro volcanic complex	U L	El Charro volcanic complex	U L	El Charro Formation	
El Chanate Formation	U	El Chanate Formation	7 6 5 4 3 2 1	El Chanate Formation	7 6 5 4 3 2 1	EL CHANATE GROUP: Escalante Fm.		El Chanate Formation	U	EL CHANATE Formation: Escalante Member	
						Anita Fm.			M	Anita Member	
	L					Pozo Duro Fm			L	Pozo Duro Member	
Sásabe Formation	U	Arroyo Sásabe Formation	U	Arroyo Sásabe Formation	U	BISBEE GROUP: Cintura Fm.		Cintura Fm.		Cintura Fm.	
	M		M		M	Arroyo Sásabe Fm.		Arroyo Sásabe Fm.		Arroyo Sásabe Fm.	
	L		L		L	Morita Fm.		Morita Fm		Morita Fm.	
						Glance Cgl.		Cerro de Oro / Glance Cgl.		Glance Cgl.	
EL CHANATE GROUP		Chupurate formation									

BISBEE GROUP	SE Arizona and NE Sonora (1)	Sierra El Tigre (2)	Sierra Azul (3)	Santa Ana (4)	Cerro de Oro (5)	Tuape (6)	Arizpe (7)	S. El Chanate (8)
Cintura	Pinkish-gray to pale-red feldspathic sandstone and grayish-red siltstone and mudstone; occasional pebble conglomerate and claystone. A few beds of impure limestone near its base. 300 to 600 m thick.	Not exposed	Red and light green siliciclastic mudstone and shale containing some sandstone, conglomerate and limestone beds. 110 m thick.	Red to purplish-red and green mudstone intercalated with gray to purplish-gray and green sandstone. 500 to 1000 m thick.	Thin- to massive-bedded brown, green, yellow, gray and purple mudstone and fine-grained sandstone, with occasional thin-bedded conglomerate lenses. 290 m thick.	Not exposed	Fine-grained sandstone and shale and sandy shale intercalated with thick-bedded limestone with abundant pelecypods, including oysters, *Inoceramus* and pectens. 800 m thick.	Red to purplish-red, thin- to medium-bedded mudstone with calcareous nodules, shale and sandstone with minor conglomerate lenses. 60 to 300 m thick.
MURAL upper	Thick-bedded medium- to light-gray fossiliferous limestone, rich in molluscan and coral debris, as well as rudists and orbitolinids. Locally calcareous shale and siltstone intercalated in the upper part. 54 to 84 m thick.	Thick- to massive bedded oyster-rich gray limestone intercalated with thin-bedded nodular sandy limestone, dark-gray and yellowish shale and sandstone. 434 m thick.	Thick to massive-bedded limestone with rudists, corals and orbitolinids, overlain by siliciclastic mudstone, shale, and less sandstone and limestone, with ooids and gastropods 245 to 280 m thick.	Thick-bedded red to pink sandstone, shaly sandstone and green, yellow and gray shale,	Thin- to massive bedded light-gray fossiliferous limestone rich in corals and rudists, and thick-bedded bioclastic limestone with gastropods and orbitolinids. 85 to 385 m thick.	Medium- to massive-bedded light-gray to reddish-brown limestone with orbitolinids, rudists, corals, gastropods, oysters, ammonoids and braquiopods. Thickness unknown.	Calcareous shale, fine-grained sandstone, thin-bedded limestone and oyster-rich marly limestone; base is thick limestone with rudists, orbitolinids, corals, gastropods, and algae. 520 to 570 m.	**Arroyo Sásabe:** Green shale, and green tuff, volcaniclastic siltstone and sandstone, purplish red sandstone with ostreid-bearing floatstone to bindstone, intercalated with gray vitric tuffs. 95 m thick.
MURAL lower	Thin-bedded, pale-yellowish-brown to pale-olive to greenish-gray oyster-rich limestone and sandstone, and calcareous siltstone and mudstone. 100 to 164 m thick.	Intercalations of fossiliferous fissile grayish shale, thin-bedded light yellow sandstone and thin- to medium-bedded gray nodular limestone. 516 m thick.	Black shale with sandstone, siltstone and a few oyster-bearing limestone. Thick-bedded limestone near its base and top with fine-shell fragments. 250 to 295 m thick.	intercalated with thick- to massive-bedded gray limestone. 100 to 650 m thick.	Thin- to medium-bedded brown mudstone intercalated with oyster-rich marly and sandy limestone and sandstone. 65 m thick.	Thin- to medium-bedded green to black fossiliferous shale, medium to thick-bedded fossiliferous limestone, and thin to medium-bedded sandstone Thickness unknown.	Calcareous shale and sandstone with thin-bedded oyster-rich limestone and sandstone. Sandstone and shale more abundant at the top. 540 to 880 m thick.	
Morita	Pinkish-gray to pale-red feldspathic sandstone and grayish-red siltstone and mudstone; occasional pebble conglomerate and claystone, and impure lime-stone near the top. Less than 400 to 1500 m thick.	Not exposed	Reddish siliciclastic mudstone and shale with sandstone and micro-conglomerate; also layers of oyster-bearing lime-stone. Clasts derived from felsic volcanic rocks. 640 to 1000 m thick.	Red to purplish-red massive-bedded mudstone, gray to purplish-gray medium-bedded sandstone, and lenses of purplish-red to mottled conglomerate. 100 to 500 m thick.	Thin- to thick bedded gray, green and purple mudstone, shale, fine-grained sandstone and occasional lenses of thin-bedded conglomerate. 260 m thick.	Thin- to thick-bedded brown, gray and maroon sandstone, red siltstone, pink quartzarenite and interbedded brown to maroon conglomerate. 800 thick.	Thick-bedded medium- to fine-grained sandstone and shale with occasional thin-bedded microconglomerate. Approx 250 m thick.	Red to purplish-red mudstone and shale, and fine- to medium-grained sandstone, lenses of igneous rock pebble conglomerate, and rare fossiliferous limestone. 193 to 486 m thick.
Glance	Poorly sorted and poorly rounded schist and limestone cobbles and pebbles bound in a matrix of reddish-brown sandy and silty mudstone. 25 to 75 to 1,100 m. thick	Not exposed	Pebble to cobble conglomerate with tuffs, volcanic litharenites, siliciclastic mudstone and minor porphyritic felsic igneous rock. 40 to 50 m thick.	Not exposed	**Cerro de Oro:** Thin- to medium-bedded conglomerate, thin to thick-bedded fossiliferous limestone and thin-bedded mudstone and sandstone. 105 to 147 m thick.	**Cerro de Oro:** Thin to medium-bedded limestone, fissile shale with calcareous nodules, fine- to medium-grained sandstone and conglo-merate. 600 m thick.	**Cerro de Oro:** Thin- to medium-bedded light-gray limestone intercalated with marly sandstone in the lower part. Approx. 30 to 50 m thick.	Green to mottled green to buff conglomerate and coarse sandstone. 21m thick.

TABLE I - Generalized lithologic description of the Bisbee Group in the areas under consideration.
1 - Ransome, 1904; Hayes, 1970; 2 - Imlay, 1939; 3- Rangin, 1986; McKee, 1991; 4 - Salas, 1968; Navarro-Fuentes, 1989; and Jacques-Ayala, 1993; 5 - González-León and Jacques-Ayala, 1988; 6 - Rodríguez-Castañeda, 1988, 1991; 7 - González-León, 1978; 8 - Jacques-Ayala, 1983, 1992, 1993, and Jacques-Ayala and Potter, 1987.

Conclusiones

CRETACICO INFERIOR

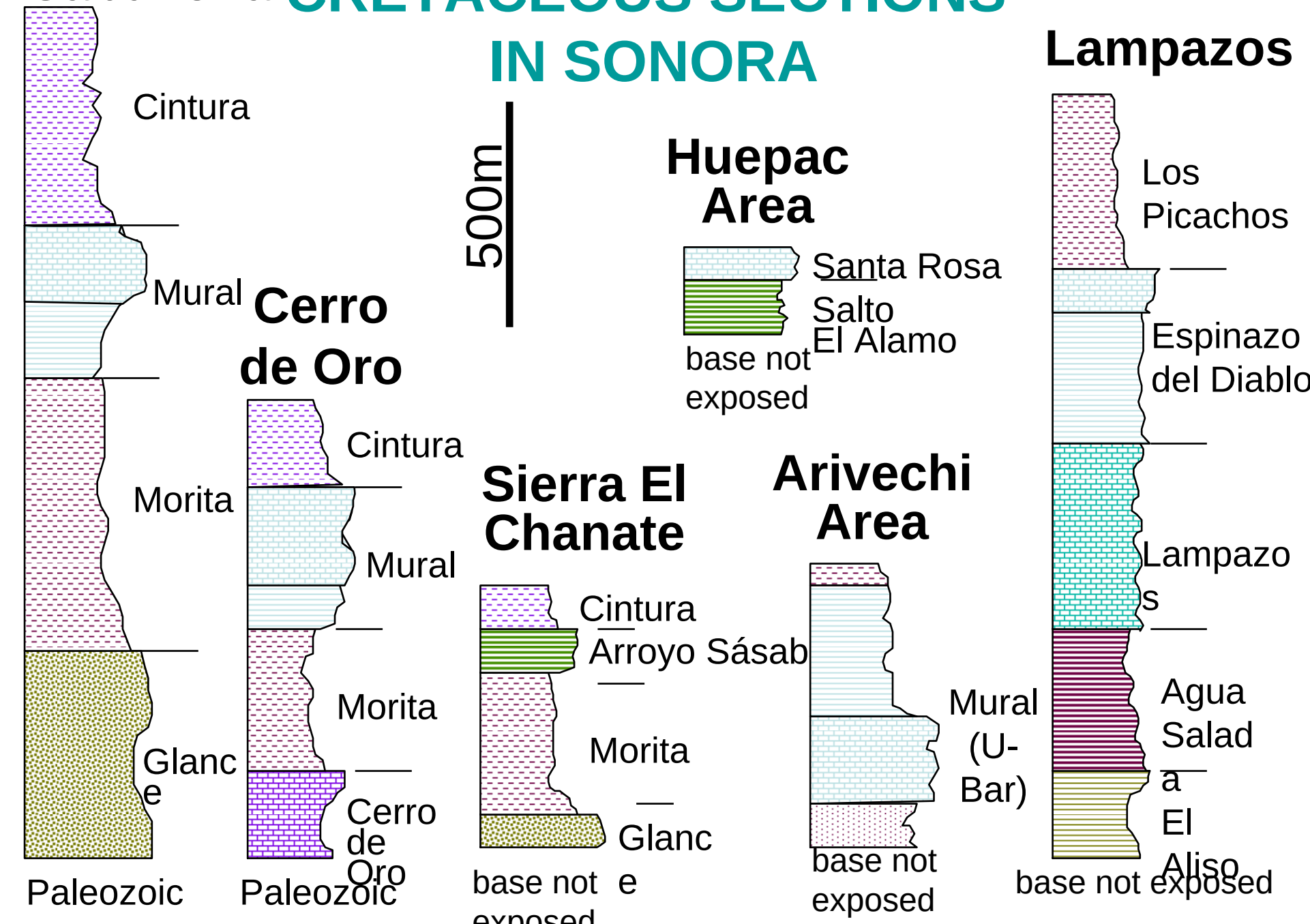
- Grupo Bisbee en todas las localidades
- Sierra El Tigre: Caliza Mural
- Sierra Azul y Cerro La Bandera: Glance, Morita, Mural y Cintura

FORMACION	AREA
• Glance :	Sierra El Chanate
• Cerro de Oro:	Cerro de Oro, Tuape y Arizpe
• Morita:	Todas las areas (espesor y litología variables)
• Cintura:	Excepto en Tuape y Sierra El Tigre

CRETACICO SUPERIOR

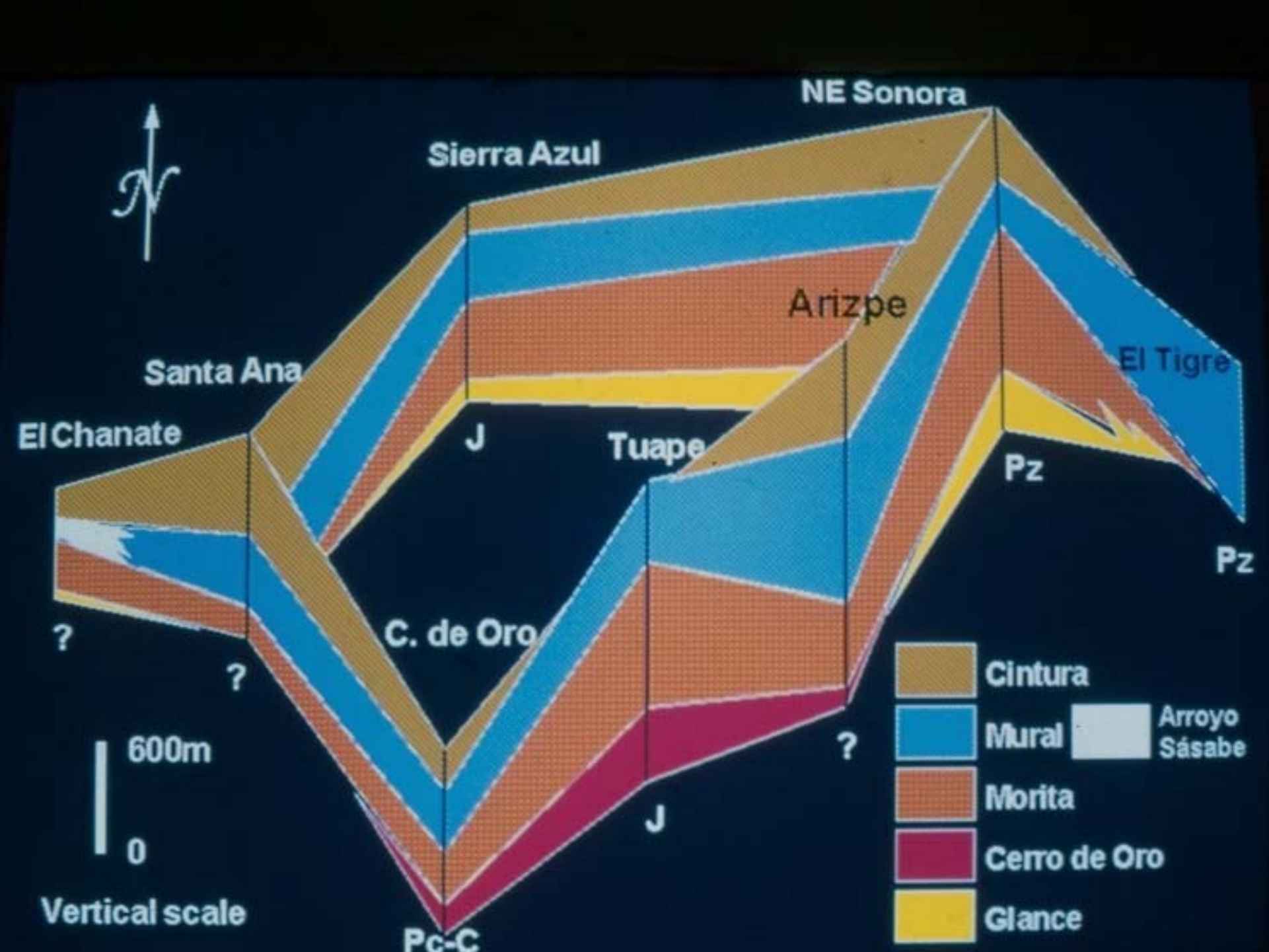
AREA	FORMACION
• Cabullona:	Grupo Cabullona
• Arizpe:	Conglomerado Aguila
• Cerro de Oro:	Formación La Palma
• El Chanate:	El Chanate El Charro

CRETACEOUS SECTIONS IN SONORA



IMPLICACIONES PALEOGEOGRAFICAS DEL GRUPO BISBEE

- Extension geográfica
- Depositación variable
  - Mural
  - Espesor variable
  - Cámbios litológicos
- Previo avance del mar (Cerro de Oro)
- Depocentro ?


N
NE Sonora
Sierra Azul
Arizpe
El Tigre
Santa Ana
El Chanate
J
Tuape
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Pz
?
?
C. de Oro
?
600m
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Vertical scale
J
Pc-C
Cintura
Mural
Arroyo Sásabe
Morita
Cerro de Oro
Glance