

A large, multi-stemmed cactus, possibly a Saguaro, stands prominently in the foreground. The cactus has numerous vertical stems of varying heights, some with small spines. The background shows a vast, hazy landscape with rolling hills and a distant horizon under a bright sky. The overall scene is a natural, outdoor setting.

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*Mixtec Computational Geolinguistics :
Structural Constraints, Functions and
Values in Space and Time*

Tu'un savi (Mixtec): a diasystemic matrix

This contribution aims to focus on the diversification of Tu'un Savi (Mixtec) in space and time, on the basis of phonological and morphological evidence.

The Oto-Manguean languages are reputed to be among the most complex of Meso-America due to the intricacy of their surface forms. Mixtec (nowadays known as *Tu'un Savi* or *Nuu Savi* by its speakers) is part of the Mixtecan sub-family, which includes Trique, Cuicatec and probably also Amuzgo (Longacre, 1957, 1961; Longacre & Millon, 1961), belonging to the eastern branch of the Oto-Manguean family of languages.

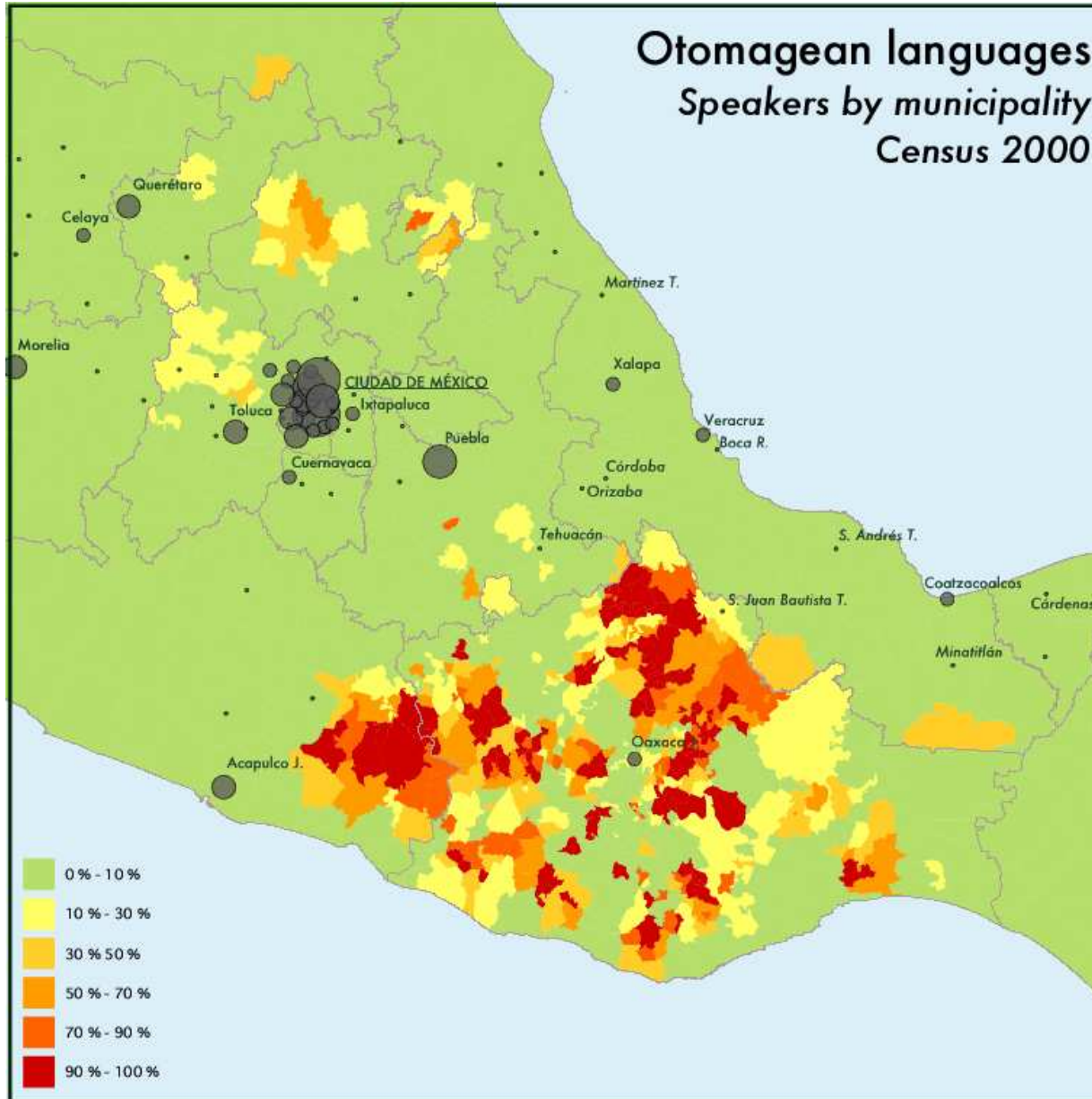
Varieties of Mixtec offer up such degrees of differentiation that we are tempted to see Mixtec as a further sub-family of Mixtecan rather than simply posit dialectal variation within a single language.

Using Kathryn's Josserand tu'un savi data (1983) and taking into account Longacre's (1957), Bradley & Josserand's (1982), and Durr's (1987) conclusions on diversification processes in Mixtec, we shall explore the complexity of modern Mixtec languages.

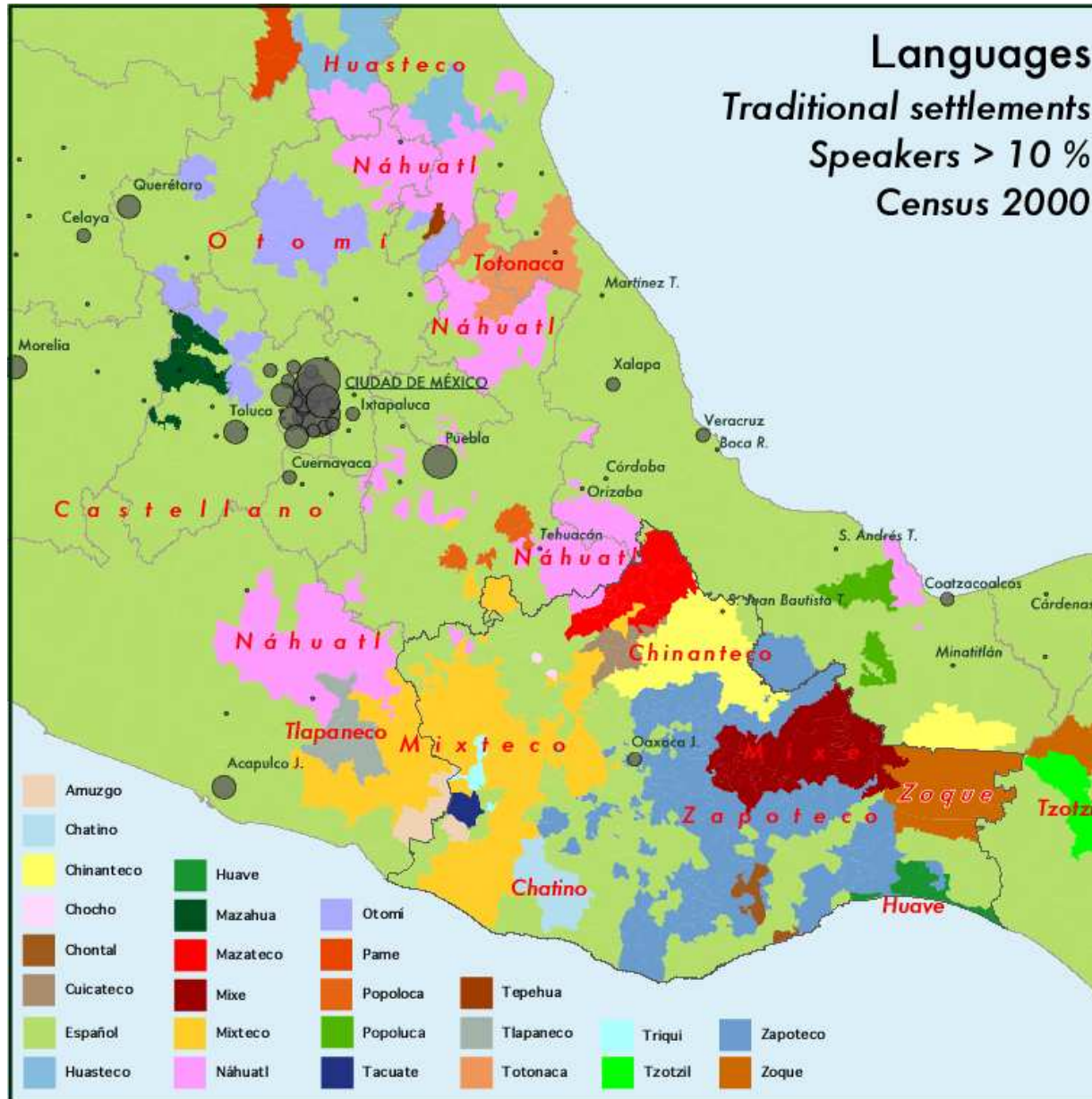
Map III-1. The Distribution of Otomanguean Languages in Mexico



Otomagean languages Speakers by municipality Census 2000

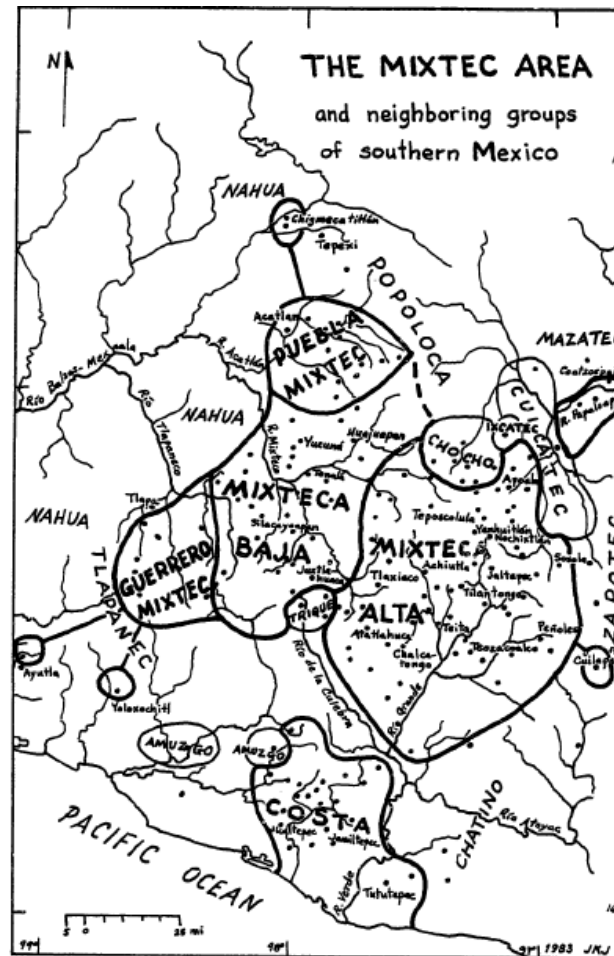


Languages
 Traditional settlements
 Speakers > 10 %
 Census 2000



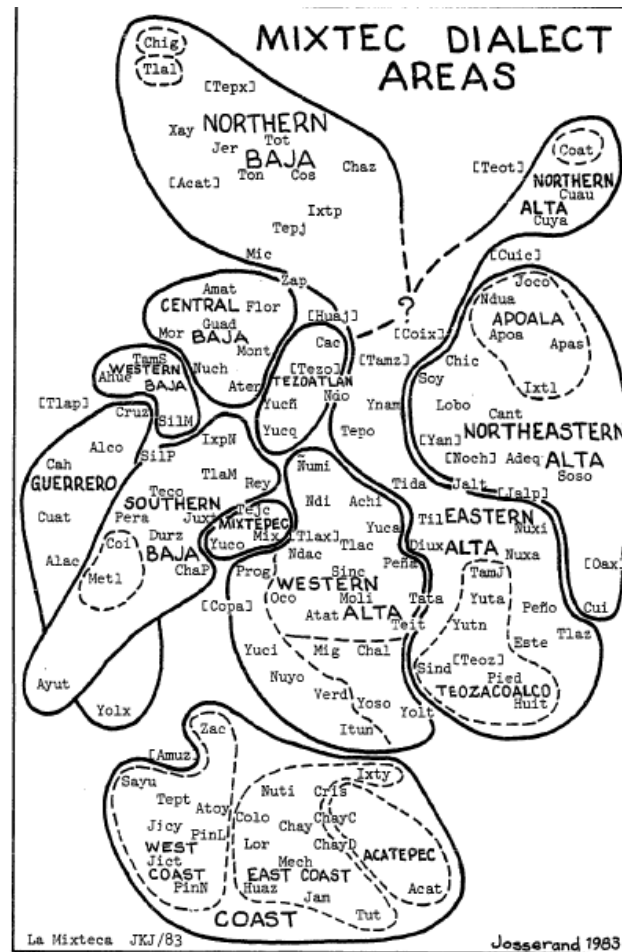
Orographic constraints

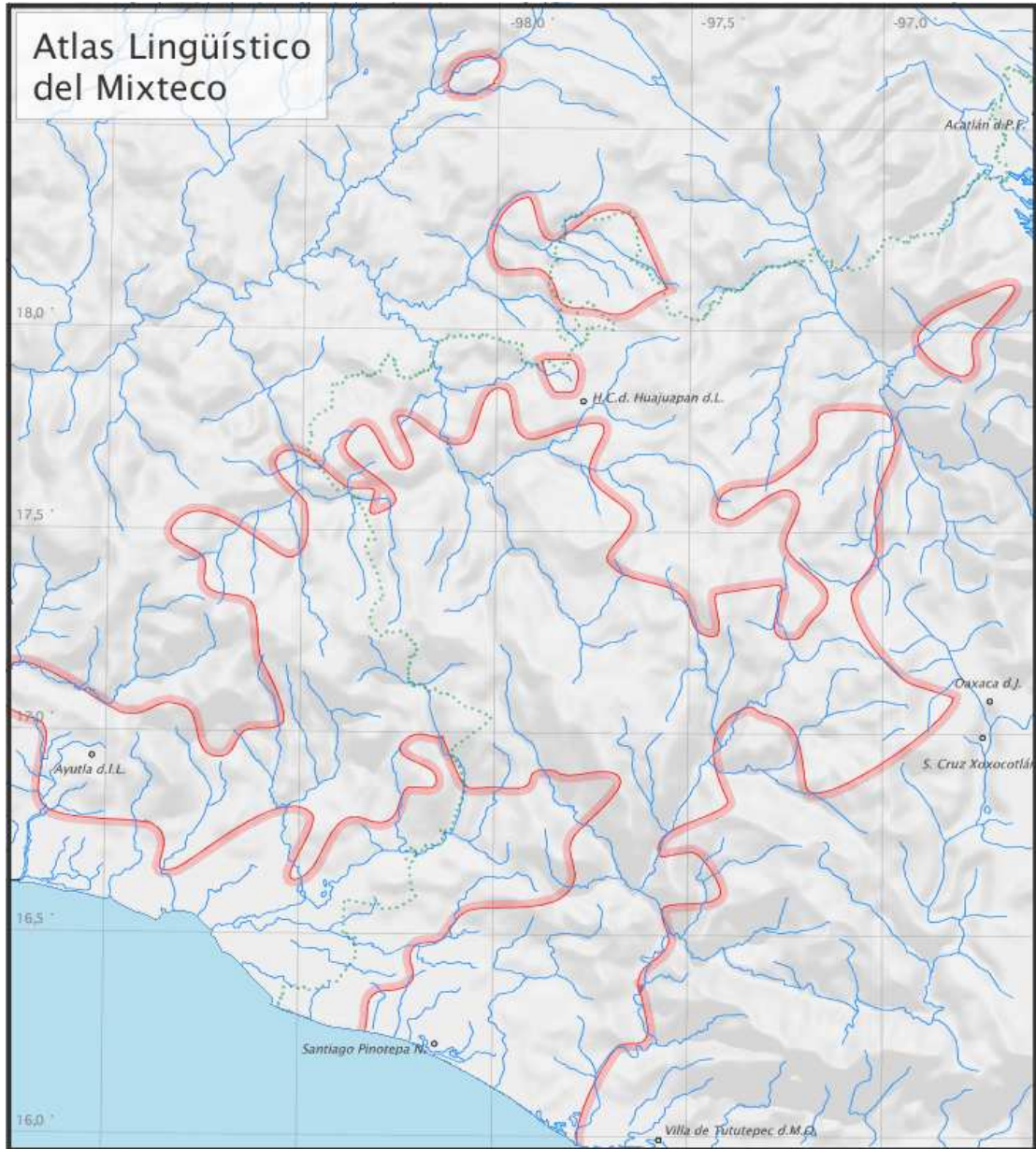
Highlands vs. Lowlands & Sea-shore

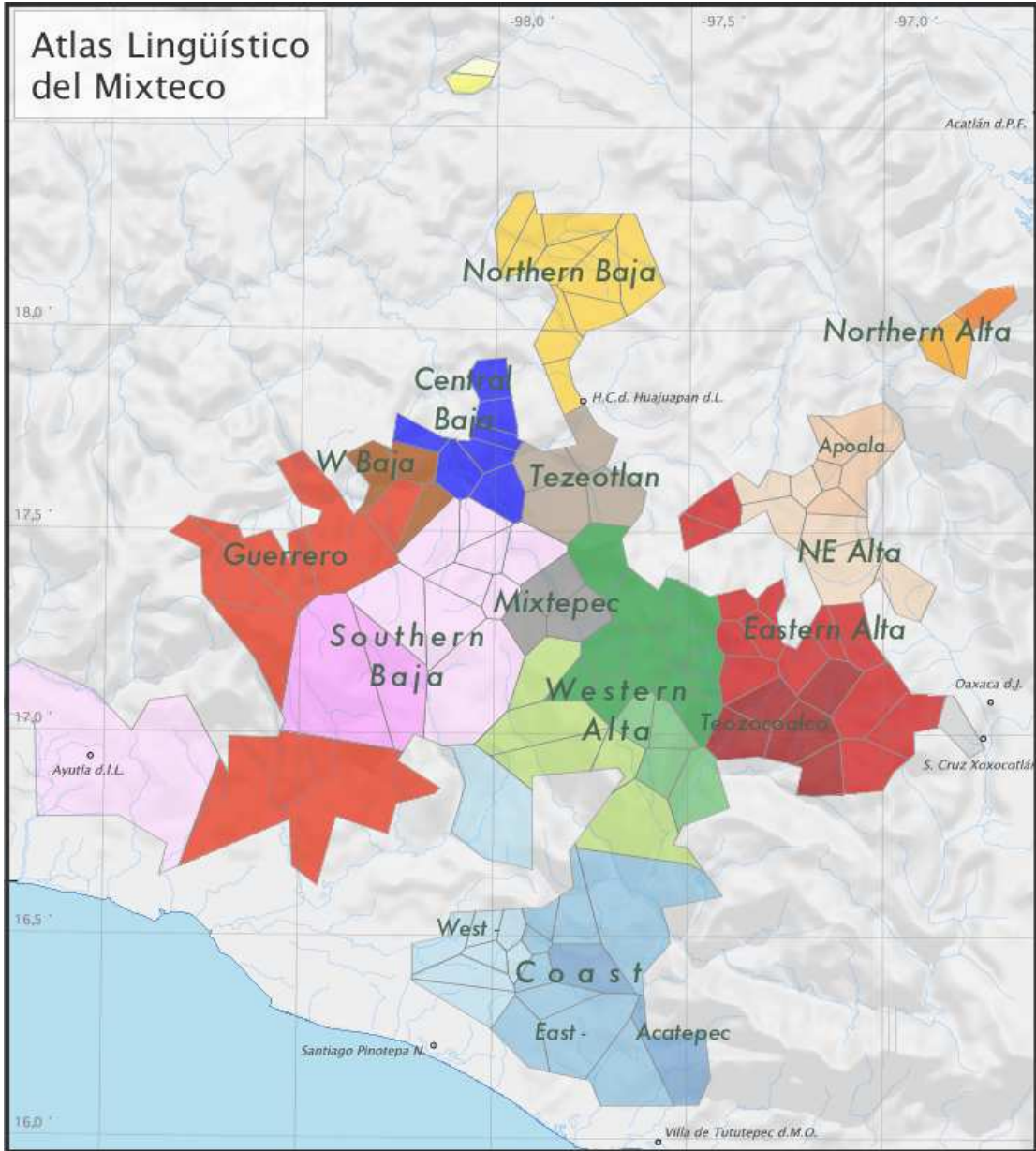




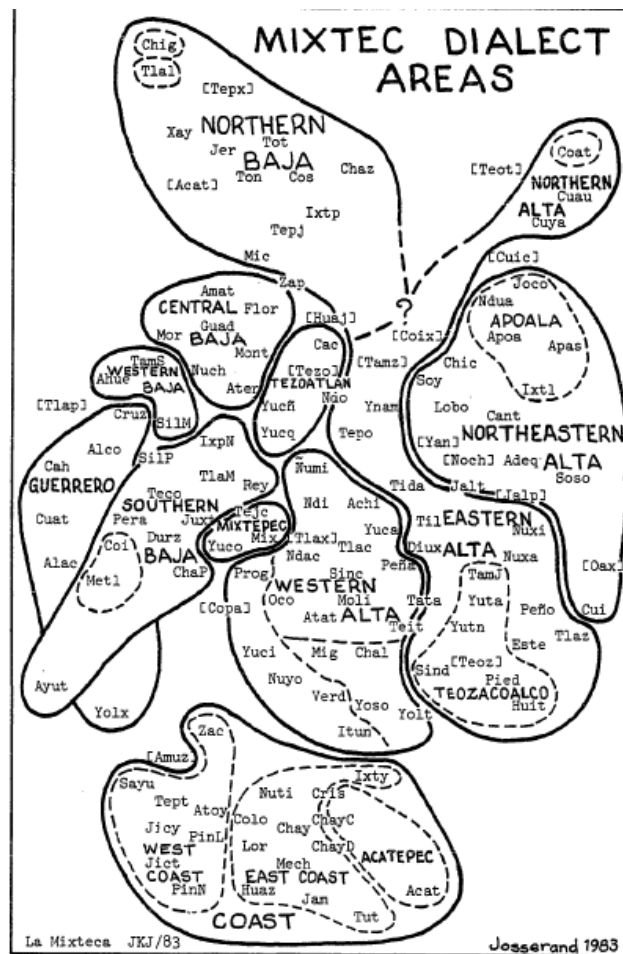
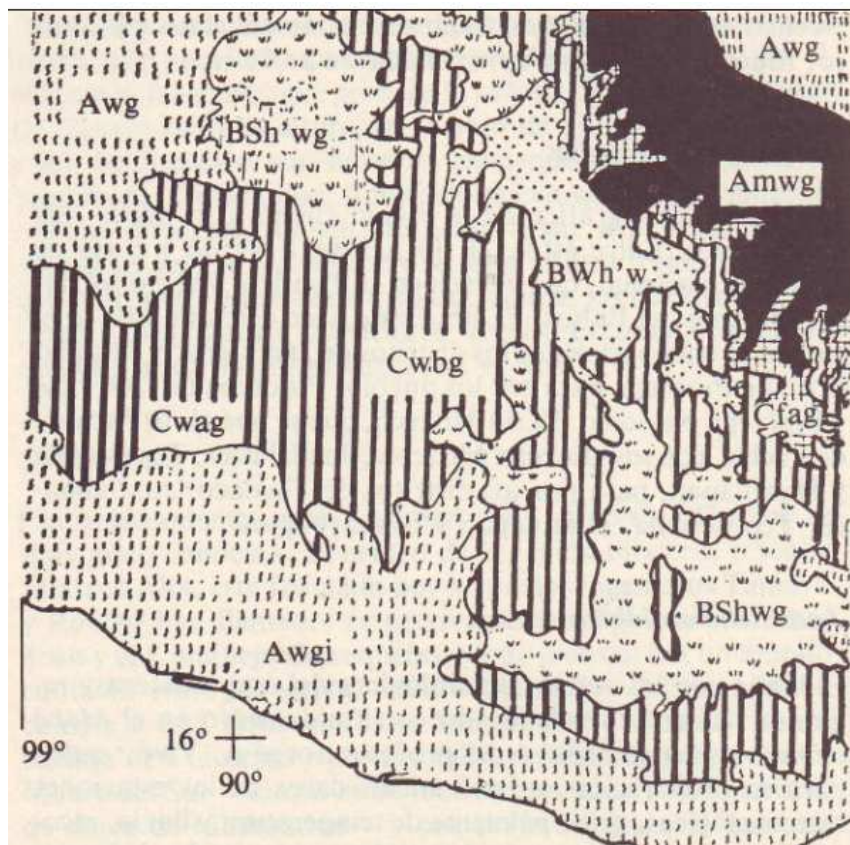
Hydrography and Josserand's dialect areas



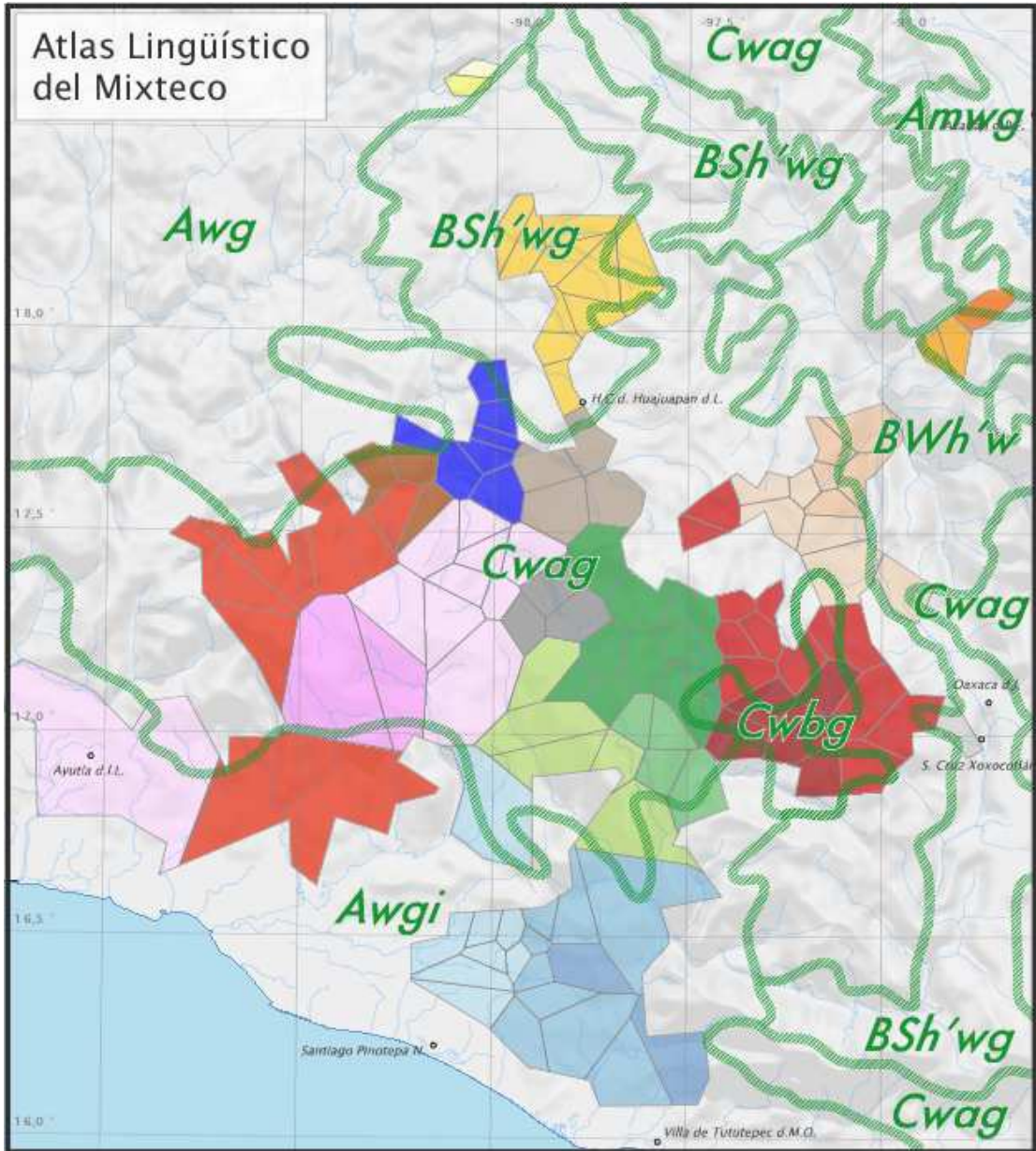




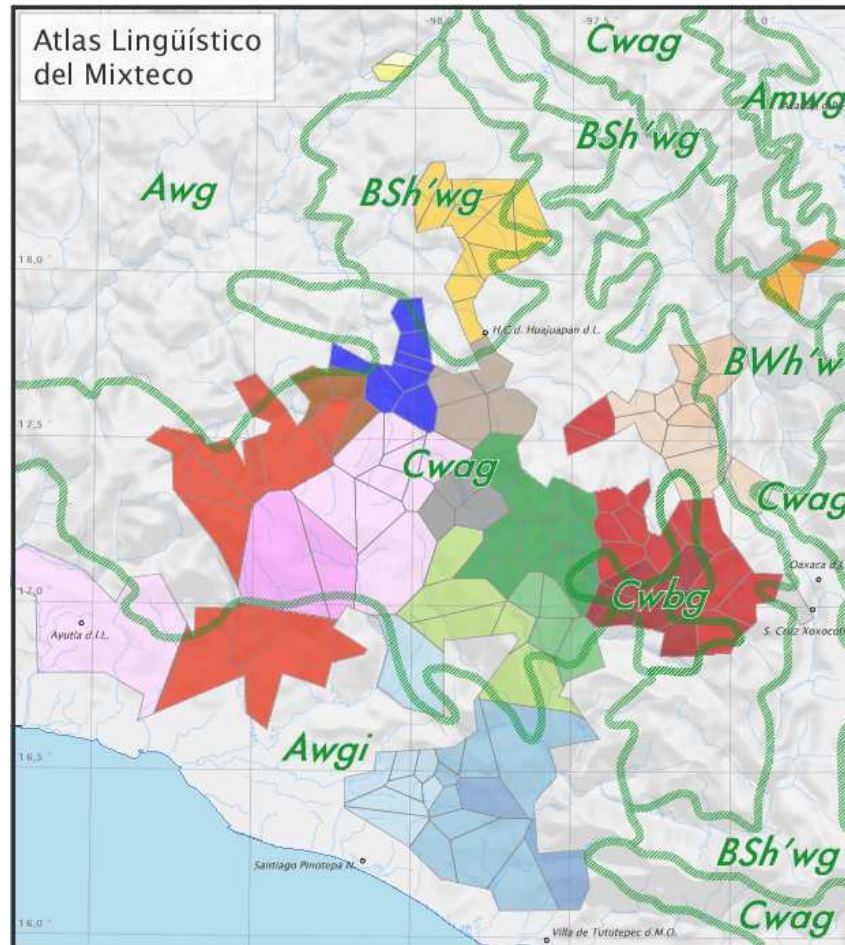
Climatic areas (on the left) *versus* dialect areas (on the right)







Source of Climatic Areas: Barbro Dahlgren [1954]-1990: 27-33



- Climate may change conspicuously over time
- Nevertheless, the *Cwag* area, where dialects cluster with the higher density is of the *Cwag* type

=> *Cwag* = Freshly temperate & rainy, highlands

The *BSh'wg* type: a steppe climate

Cwbg: temperate, moderately rainy

The first attempts to classify Mixtec dialects



CHART III-1
HOLLAND'S AREAL GROUPINGS OF MIXTEC DIALECTS

Area	Zone	Dialects (= Towns)	Actual Locations (corrections marked by *)
Baja	XI	Tlaltēpan, Chigmecatitlán	Baja (Puebla)
	X	Coatzacoapan	*Alta (Northeast Alta)
	IX	Cuyamecalco	*Alta (Northeast Alta)
	VIII	Jocotipac	*Alta (Northeast Alta)
Alta	III	San Miguel, etc.	Alta
	IV	San Rafael	*Baja (Guerrero)
	V	Juxtlahuaca	*Baja
	VI	Huitepec, etc.	Alta
	VII	Peñoles	Alta
Costa	I	Ixtayutla...Huazolotitlán	Costa
	II	Ixtayutla...Pinotepa de Don Luis	Costa

A Model for diasystemic & ecolinguistic analysis

Function & value

- Function: a range of structural & areal features
- Values: taxinomic intrinsic features (spirants versus sibilants, approximants versus obstruents, etc.), markedness & discreteness

Function

- What makes an isogloss work as a hint ?
- Structural hint (*intrinsic*, typological clue)
- Areal hint (*extrinsic*, ecolinguistic clue)

Nelson Goodman

- (1) syntactic density
- (2) semantic density
- (3) relative repleteness
- (4) exemplification
- (5) multiple and complex reference

Nelson Goodman, 1978.

WAYS OF WORLDMAKING

Chapter IV. When Is Art?

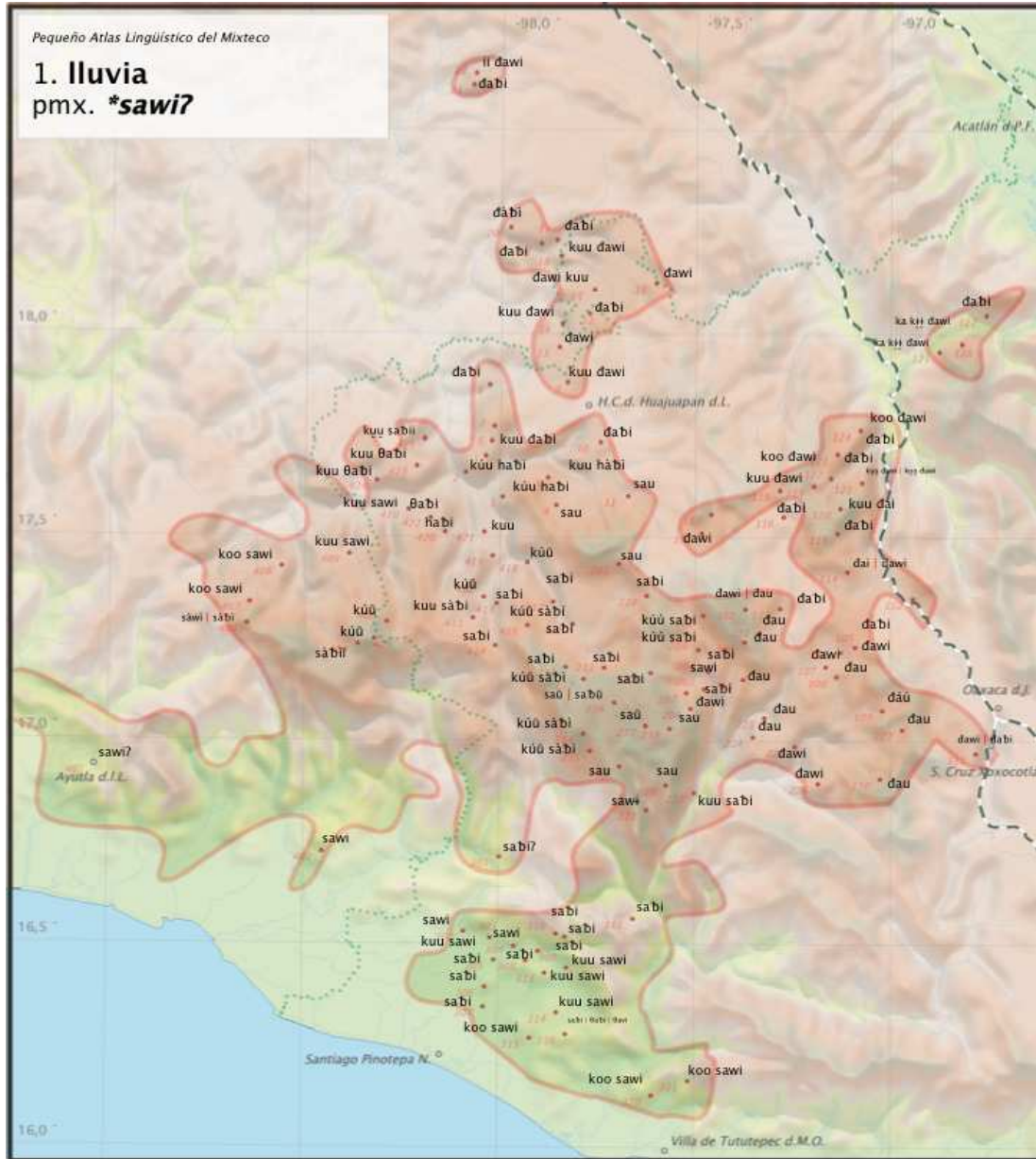
- “The question just what characteristics distinguish or are indicative of the symbolizing that constitutes functioning as a work of art calls for careful study in the light of a general theory of symbols. That is more than I can undertake here, but I venture the tentative thought that there are five symptoms of the aesthetic: (1) syntactic density, where the finest differences in certain respects constitute a difference between symbols — for example, an ungraduated mercury thermometer as contrasted with an electronic digital-read-out instrument; (2) semantic density, where symbols are provided for things distinguished by the finest differences in certain respects — for example, not only the ungraduated thermometer again but also ordinary English, though it is not syntactically dense; (3) relative repleteness, where comparatively many aspects of a symbol are significant — for example, a single-line drawing of a mountain by Hokusai where every feature of shape, line, thickness, etc. counts, in contrast with perhaps the same line as a chart of daily stock market averages, where all that counts is the height of the line above the base; (4) exemplification, where a symbol, whether or not it denotes, symbolizes by serving as a sample of properties it literally or metaphorically possesses; and finally (5) multiple and complex reference, where a symbol performs several integrated and interacting referential functions, some direct and some mediated through other symbols”.

(Space-Time) Function

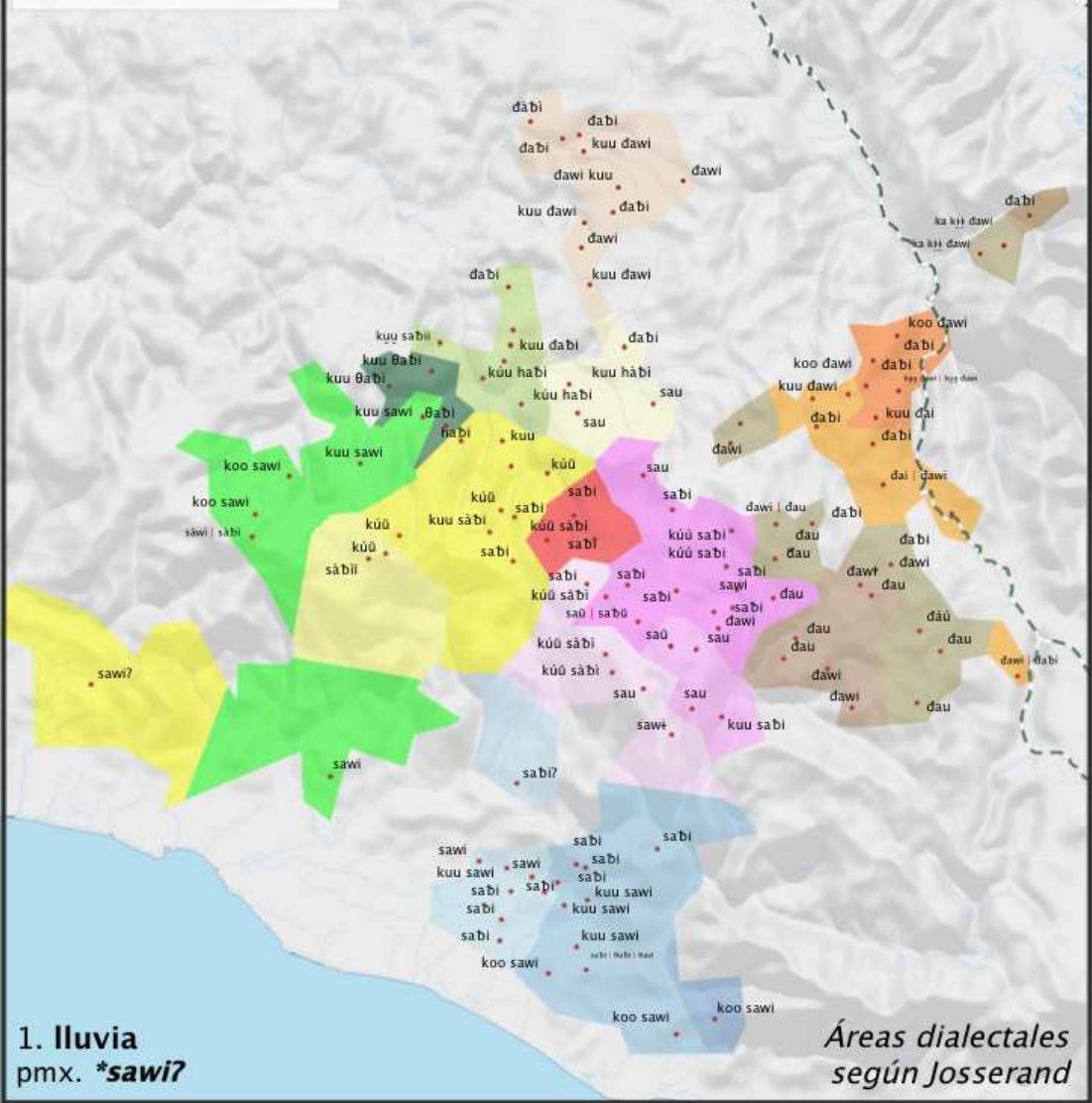
- (1) syntactic density
- (2) semantic density
- (3) relative repleteness
- (4) exemplification
- (5) multiple and complex reference

- 1. **Topological density:**
extension, areal/spatial diffusion
- 2. **Structural density** (values, i.e. features & markedness)
- 3. **Relative repleteness** (fine grained structural & areal contrastiveness)
- 4. **Exemplification** = sampling
=> *distributional patterns*
- 5. **Multiple and Complex Reference** (intertwined variables) => typological implications and derivational sets, competing hypothesis

1. Lluvia pmx. **sawi?*



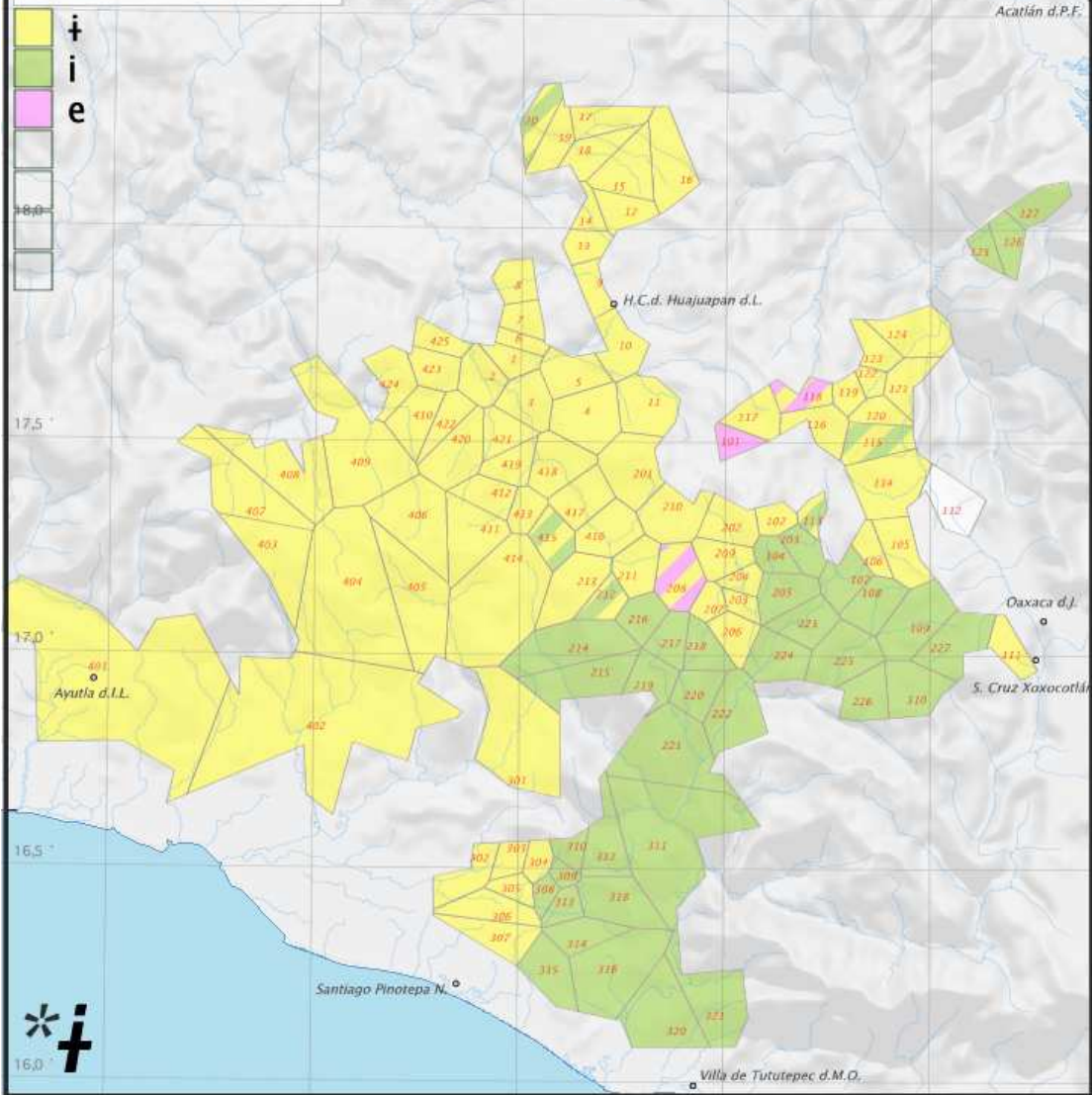
Atlas Lingüístico del Mixteco



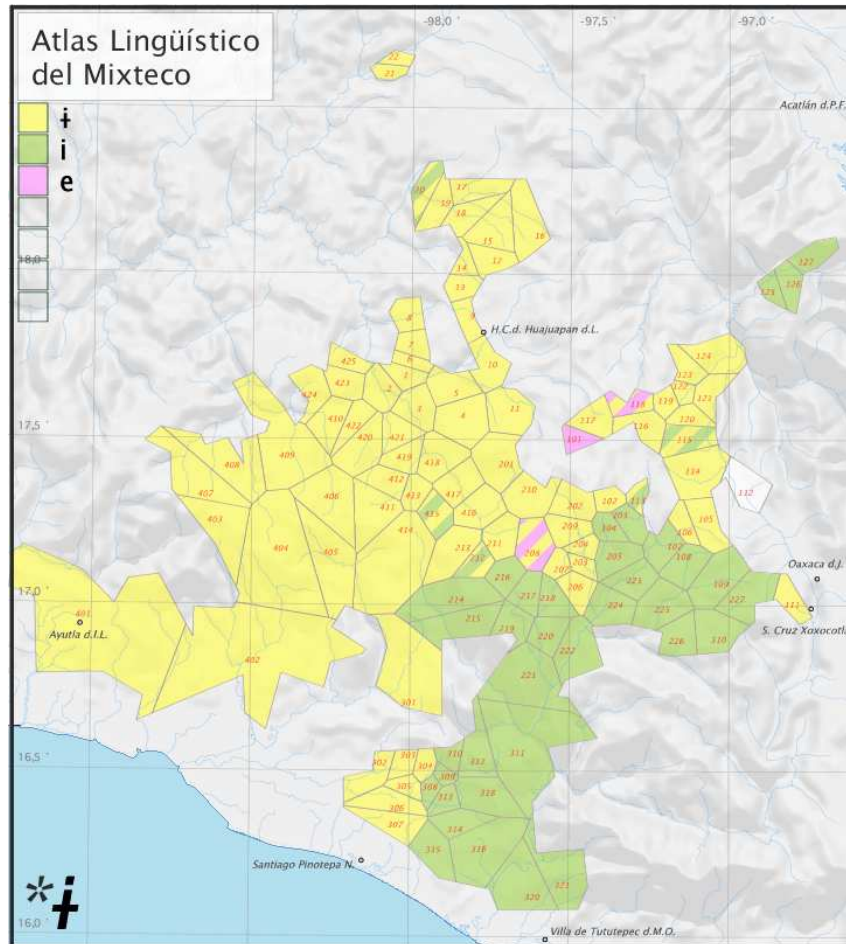
1. Iluvia
pmx. ***sawí?**

Áreas dialectales
según Jossierand

Atlas Lingüístico del Mixteco



Function & value of +RTR *i



- 1. topological density (**TD**)
=> *Equipollent extension*
- 2. structural density (**SD**)
=> +/- *RTR nucleus*
Retracted *i* / plain *i*
- 3. Relative repletteness (**RR**)
=> *V [-High]*
- 4. Exemplification
Root Vowel, Class. & Spec.
- 5. Multiple & complex reference (**MCR**)
Palatalising subproduct -Ci-

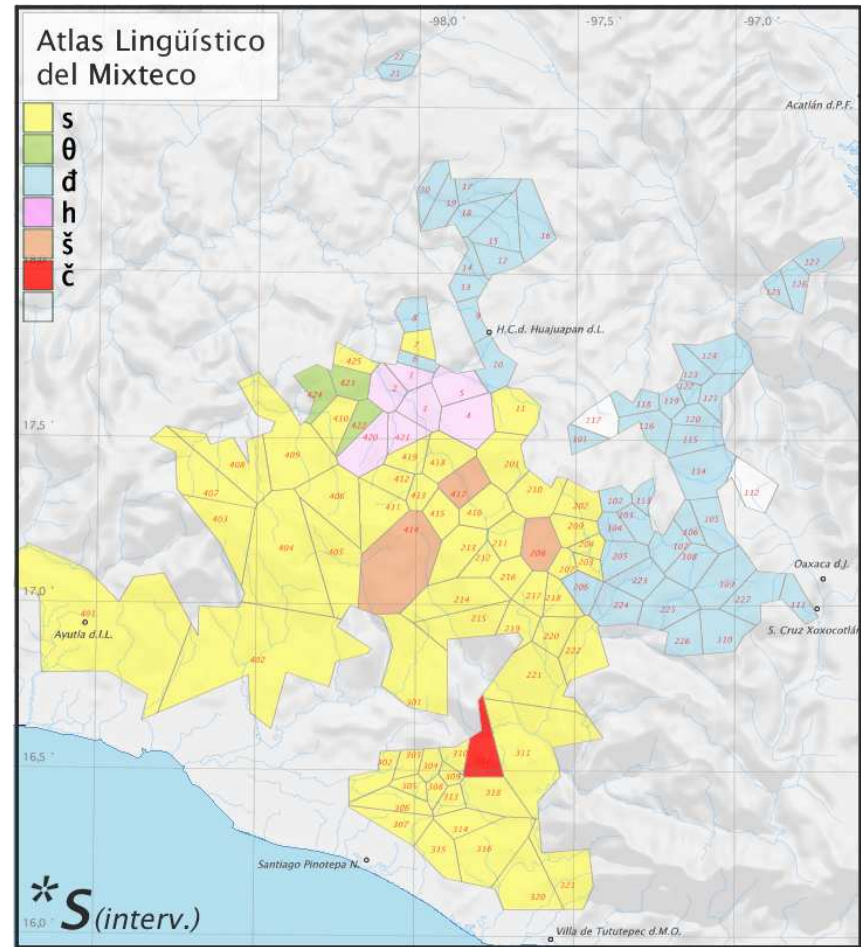
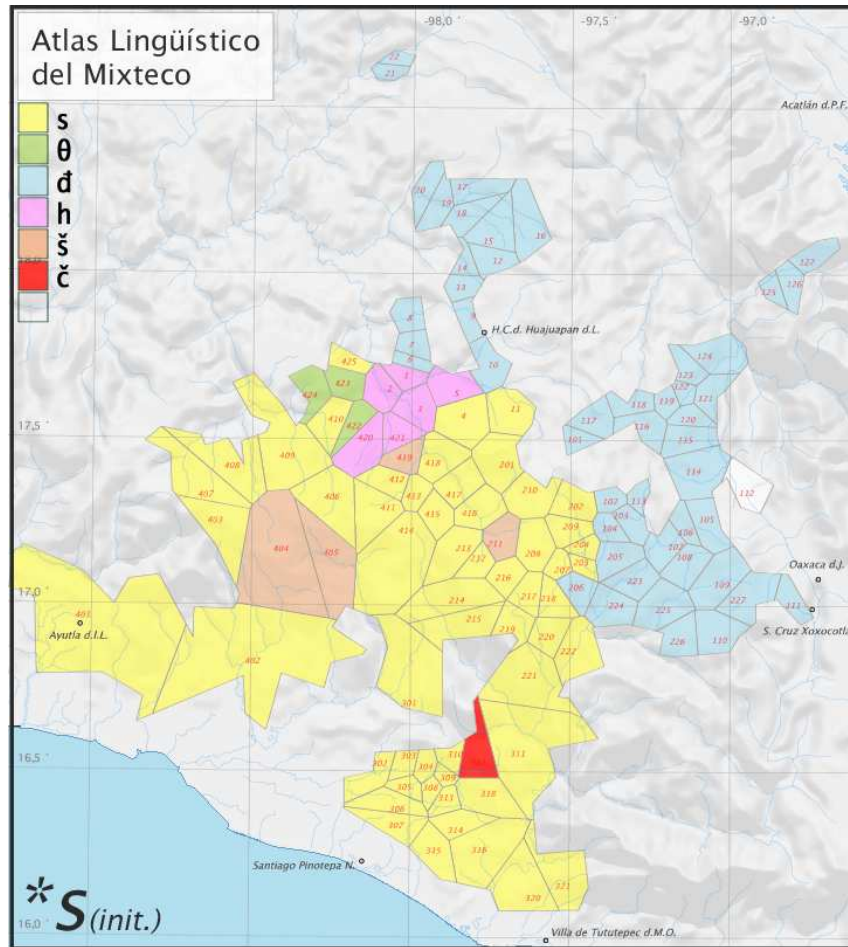
Original data, by Kathryn Josserand (1983)

NE Alta	35) animal	36) se acaba	37) blanquillo	38) espuma	39) sangre
	animal	it finishes	egg	foam	blood
P-Mixtec	*kítɨʔ	*n ⁿ dɨʔɨʔ	*n ⁿ dɨwɨʔ	*tɨ iyu	*nɨyɨʔ
Tepo	kete	n ⁿ deʔe	n ⁿ dewi	ifɨ	neʔe
Tida	kiti	n ⁿ diʔi	n ⁿ diwi	ti iʔu	nɨi
Til	kítɨ	[ⁿ zɨnɨ]	n ⁿ dɨu	ifɨ	nɨʔɨ
Diux	kítɨ	—	n ⁿ dɨu	iʔu	nɨʔɨ
Nuxi	ti (k ^w ɨʔnɨ)	—	n ⁿ dɨbi	čɨnɨɨ	nɨʔɨ
Nuxa	kiti	n ⁿ diʔi	n ⁿ diwi	čɨnɨɨ	nɨʔɨ
TamJ	kítɨ (x ^w ɨʔnɨ)	(nɨ) n ⁿ dɨʔɨ	n ⁿ dɨwɨ	tiy/tiʔu	nɨʔɨ
Yuta	kítɨ	—	n ⁿ dɨbi	Nniy	nɨʔɨ
Peño	kítɨ	n ⁿ dɨʔɨ	n ⁿ dɨú	tnɨɨ	nɨʔɨ
Este	kítɨ	n ⁿ dɨʔɨ	n ⁿ dɨwɨ	tniy	nɨʔɨ

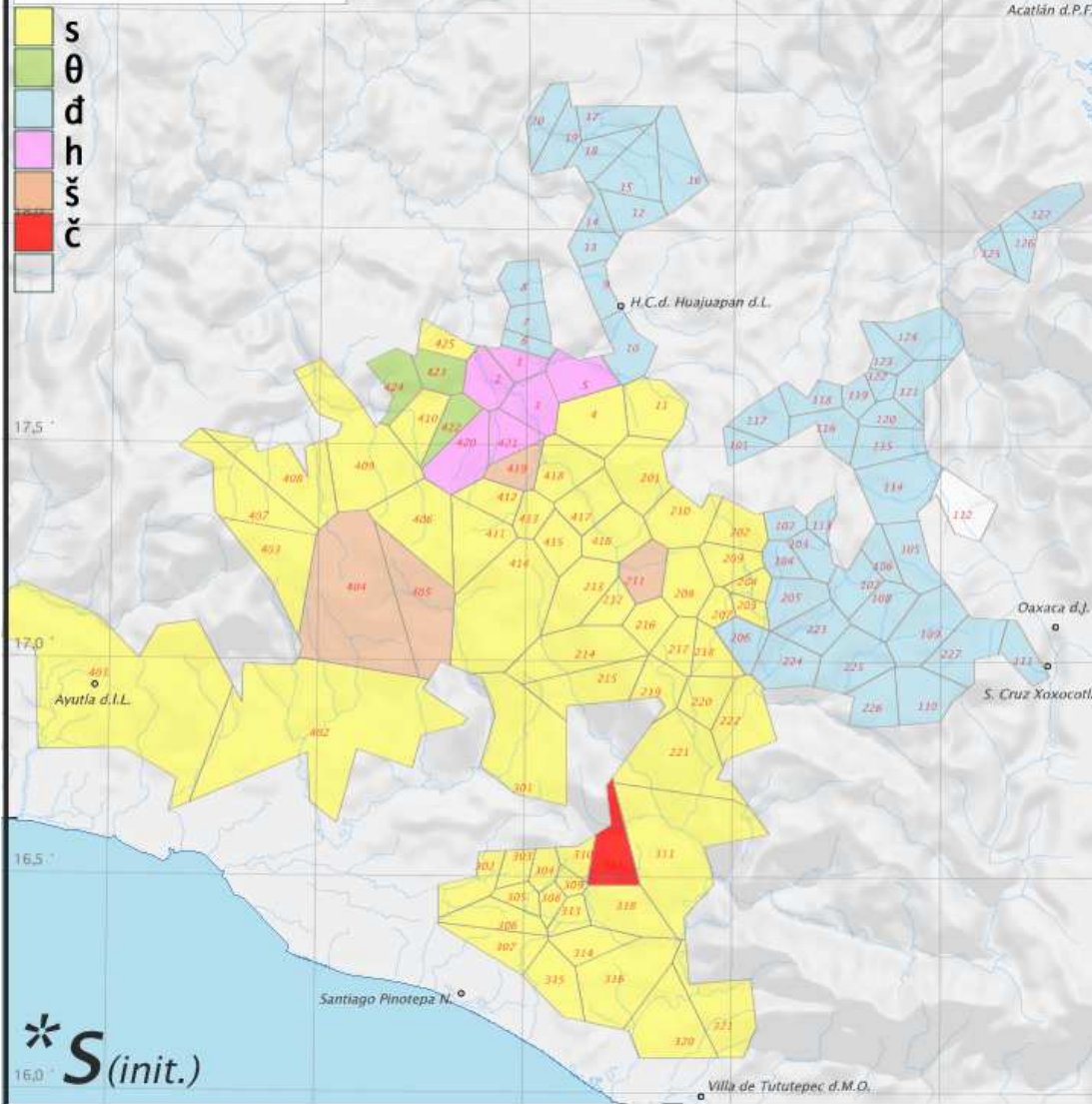
Num_PALM	cl_†	vis_answers
112	0	kuu žiku
310	1	kumi niñi ñi yiki tii tibi "dišisi čiti si7ba tiñi
219	1	kuu niñi ñi yiki yiyi tii tiwi sukwa kisi yiti si7i tniñi kwiñi "diyi
215	1	kumi niñi ñi yiki yiyi tii tiwi sukwa kisi niñi 7iti si7i tiñi kwiñi ni7yi
103	1	koo niyi ñi žixi žiži tni kidi "didi "diša šiti ti7i 0u7a ti tniñi kwiña "di7i
107	1	ximi niñi ñi žixi šixi Nni tibi đuxu kidi "didi šiti Nnu di7i du7a č Nniñi xwiyu "di7ži
109	1	kumi niñi ñi žixi žiži tni tiwi đukwa kidi "didi šiti diñi tniñi "di7ži
227	1	kumi niñi ñi žixi žiži tni tiwi đukwa kidi "didi "dise šiti nu di7i niñi kwiñi "di7ži
110	1	kumi niñi ñi žiži tni tiwi đukwa kidi "didi "disa šiti di7i di7wa tniñi "di7ži
226	1	ximi niñi ñi žixi žiži Nni tiwi điki dixwa kidi "didi "dixye žiti xwiñi nu di7i č niñi "di7ži
225	1	ximi niñi ñi žixi žiži tni tiwi kidi "didi it di7i xwiñu "di7ži
224	1	kumi niñi ñi žixi žiži tni tiwi kidi "didi it du7wa č niñi kwi "di7ži
222	1	kuu niñi ñi žixi žiži tni tibi suka kisi "diši šiti si7iñi niñi kwiñi "di7ži
311	1	kumi niñi ñi yiki yiyi tii tibi sukwa kisi "diši "diča čiti si7i su7ba tiñi kwiñu "di7yi
321	1	kumi niñi ñi yiki yiyi tii sukwa kisi "diši "disa šiti si7wa tiñi kwiño "di7yi
320	1	kumi niñi ñi yiki yiyi tii sukwa kisi "diši "diča čiti si7wa tiñi kwiño "di7yi
316	1	kumi niñi ñi yiki kwa7a yiyi tii tiwi sikkwa kisi "diši "diča čiti si7iñi si7ba tiñi kwiñu7u "di7yi
315	1	kumi niñi ñi yiyi tii tiwi sikkwa kisi "diši "diča čiti su7wa tiñi kwiño "di7yi
127	1	kimi niñi ñi šiki šixi tibi e đukwa kidi "didi it če7e 0i7ba šitiñi kwiñu "diši
126	1	kimi niñi ñi žiži tii ka tiwi kidi "didi žiti če7e di7wa tiñi "di7ži
125	1	kimi niñi ñi žixi žiži tii ka tiwi kidi "didi žiti se7e di7wa tiñi "di7yi
104	1	kuu niñi ñi žixi tni tiwi šiti ti tniñi "di7i
108	1	kimi niñi ñi žixi Nni "da tibi "didi "di7ži
205	1	kuu niñi ñi žixi šiyi Nni tiwi du7a sNniñi "diyi
216	1	kuu niñi ñi yiki yiyi tii tiwi tibi kisi "diši žiti si7i su7ba Nniñi kwiñi "di7yi
223	1	xumi niñi ñi yuxi "di7ži
217	1	kuu niñi ñi žixi žiži tii ni7i tiwi sukwa kisi "diši xiti si7i su7a tiñi kwiñi "di7ži
218	1	kuu niñi ñi žixi tii tiwi suka kisi "diši xiti si7i su7ba tiñi kwiñi "di7ži
214	1	kumi niñi ñi žixi tii xiti tiwi sukwa kisi "diši xiti si7i tiñi kwiñi ni7ži
220	1	kuu niñi ñi žixi Nni tiwi sukwa kisi "diši xiti si7i su7ba kwiñi "di7ži
309	1	kumi niñi ñi yiki yiyi tii tiwi sukwa kisi "diši "diča čiti si7i tiñi kwiñu "di7yi
308	1	kumi niñi ñi yiki yiyi tii tiwi sukwa kisi "diši "diča čiti si7i čikula tiñi kwiñu "di7yi
221	1	kuu niñi ñi yiki yiyi tii tiwi sukwa kisi "diši yiti si7i tiñi kwiñi "di7yi
313	1	kumi niñi ñi yiki yiyi tii tiwi sikkwa kisi "diši "diča čiti si7iñi su7wa tiñi "di7yi
314	1	kumi niñi ñi yiyi tii tiwi sukwa kisi "diši "diča čiti si7iñi su7wa tiñi "di7yi
318	1	kumi niñi ñi yiyi tii tiwi sukwa "diši "diča čiti si7iñi su7wa tiñi kwiñu "di7yi
312	1	kumi niñi ñi yiki "jiji tii tibi "dišči tiñi "di7yi
307	2	kumi niñi ñi žixi žiži tii tibi sukwa kisi "diši "diča čiti si7i si7ba tiñi "di7i
306	2	kumi niñi ñi žixi žiži tii tibi sukwa kisi "diši "diča čiti si7i si7ba tiñi kwiñu "di7i
302	2	kumi niñi ñi žixi žiži tii tiwi sukwa kisi "diši "diča čiti si7i si7wa tiñi kwiñu "di7i
303	2	kumi niñi ñi žixi žiži tii tiwi sukwa kisi "diši "diča čiti si7i si7wa tiñi kwiñu "di7i
304	2	kumi niñi ñi žixi žiži tii tiwi sikkwa kisi "diši čiti si7i si7wa tiñi "di7i
301	2	kumi niñi ñi žixi žiži tii tiwi sukwa kisi "diši "diča čiti si7i si7ba tiñi kwiñu "di7i
414	2	kumi niñi ñi žixi žiži tii tibi "diši si7ba tiñi "di7i
405	2	kumi niñi žiži žiži tii tiwi šikwa kisi "diši "diša šiti si7i tiñi kwiñu "di7i
404	2	kumi niñi žiži žiži tii tiwi šikwa kisi "diši "diša šiti si7i tiñi kwiñu "di7i
403	2	kumi niñi žiži žiži tii tiwi šikwa kisi "diši "diša tniñi "di7i
407	2	kumi niñi žiži žiži tii tiwi šikwa kisi "diši "diša šiti si7i si7wa tiñi kwiño "di7i
408	2	kumi niñi žiži žiži tii tiwi šikwa kisi "diši šiti si7i si7wa tniñi kwiño "di7i

The Proto-Sibilant in disjunctive context:

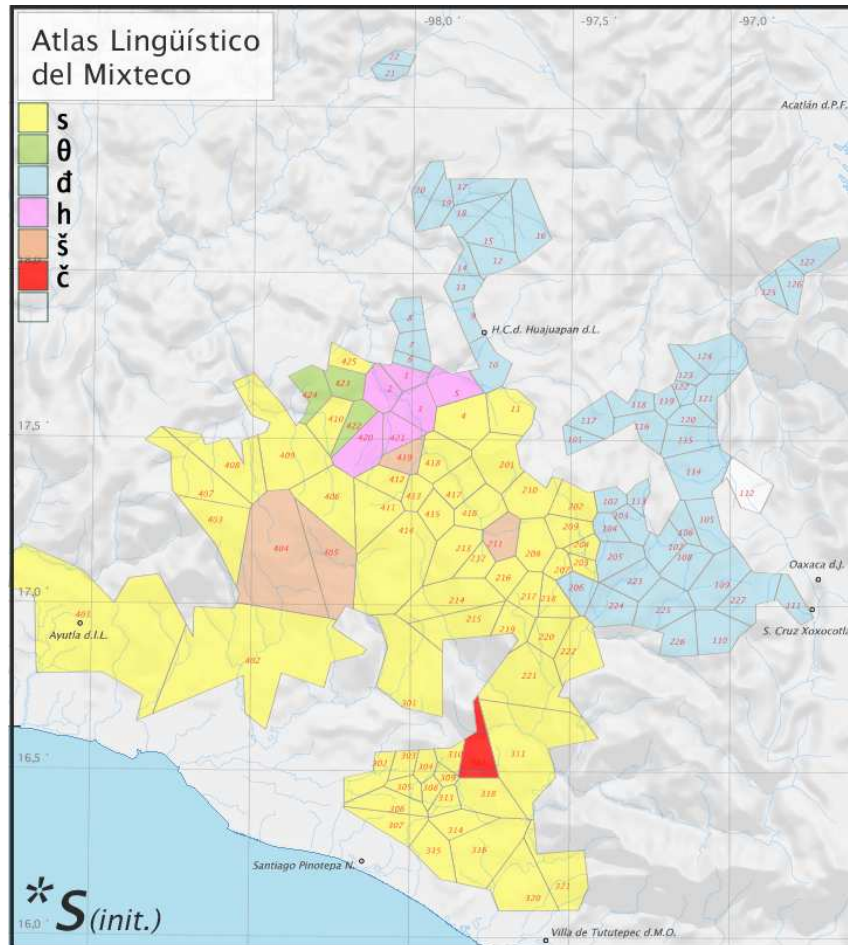
#_, V_V



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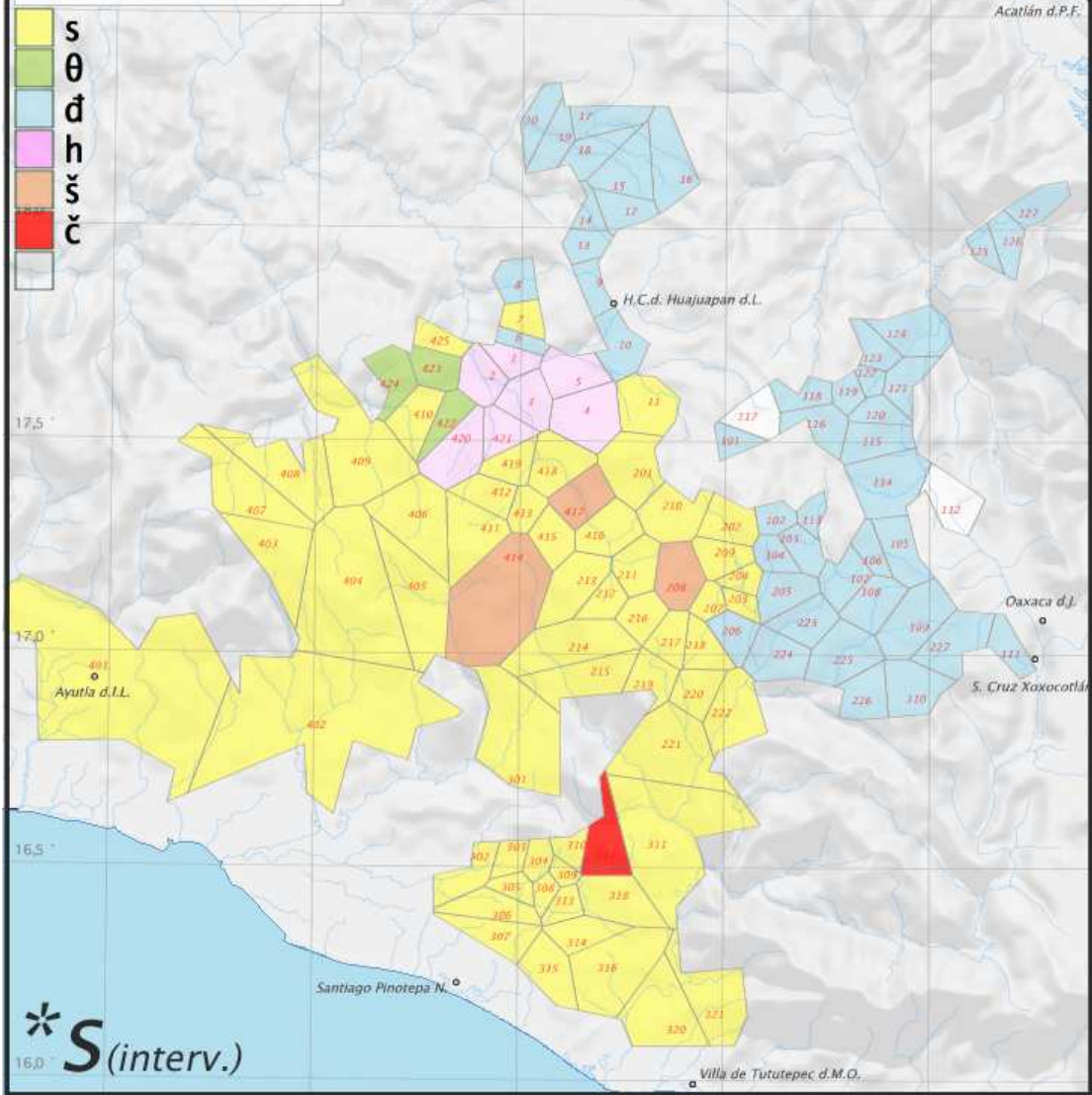


Function & value of *s (init.)

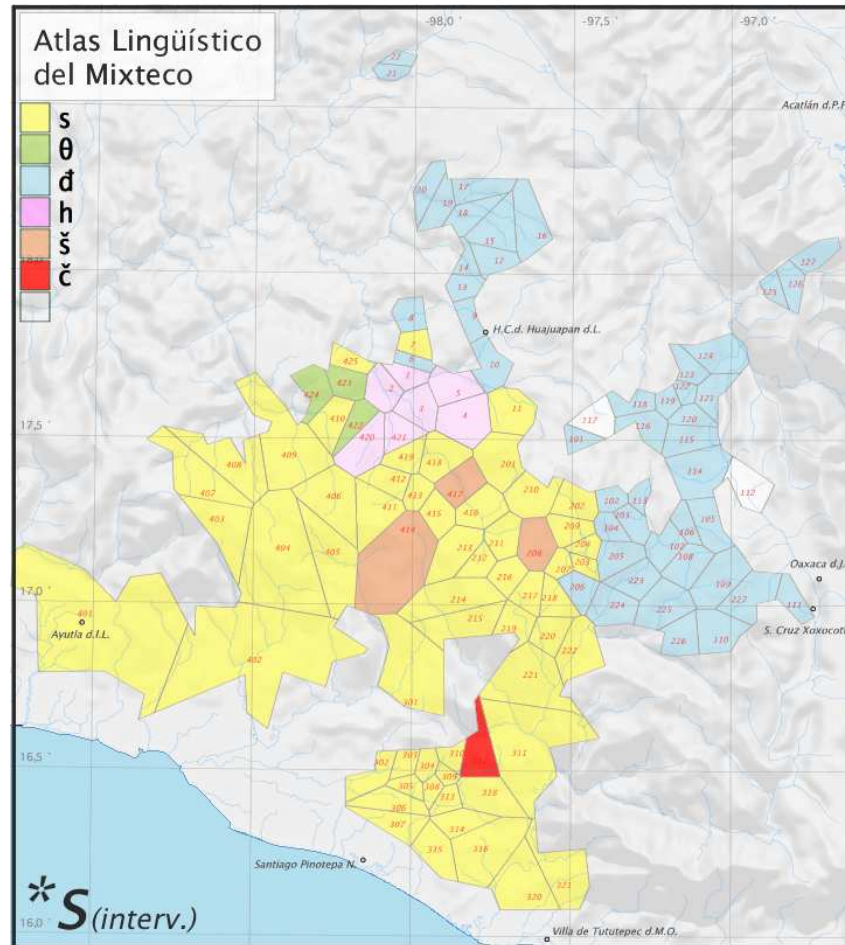


1. Topological density (TD)
=> *Polycentric*
2. Structural density (SD)
=> High SD: *continuity & acute/gravis*
3. Relative Repleteness (RR)
=> *Sets of spirants of the gravis type*
4. Exemplification
=> *Root Onset, Class. & Spec*
5. Multiple and complex reference (M&CR)
=> *High degree of areal overlapping*

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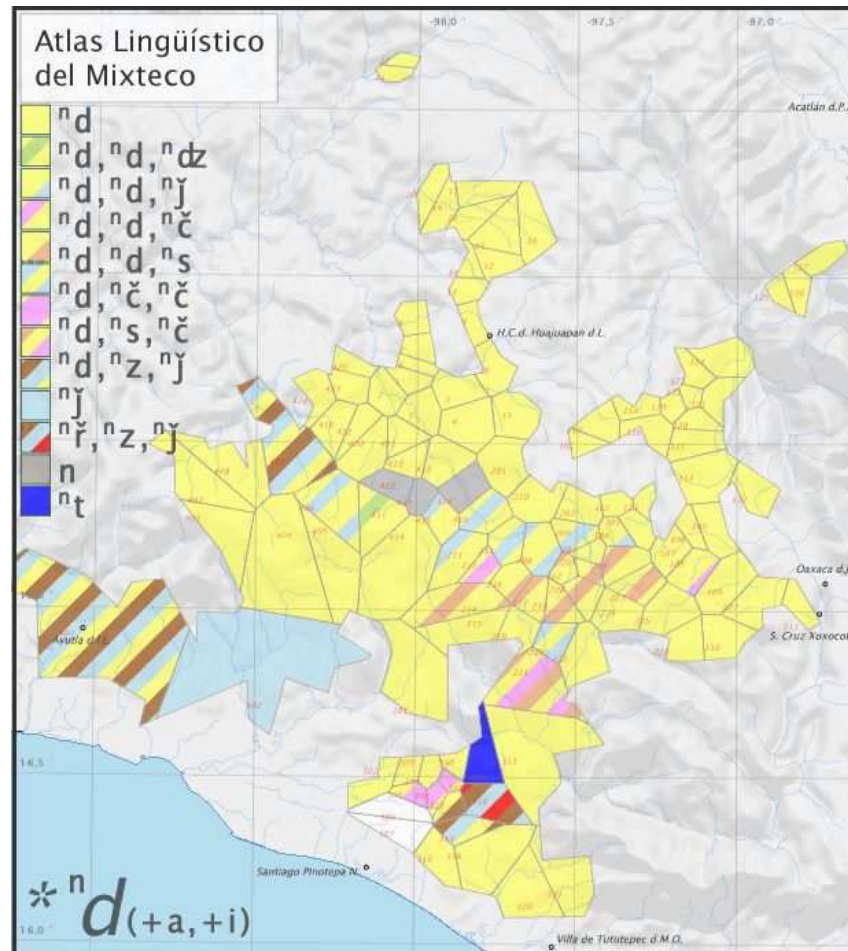


Function & value of *s (intervoc.)

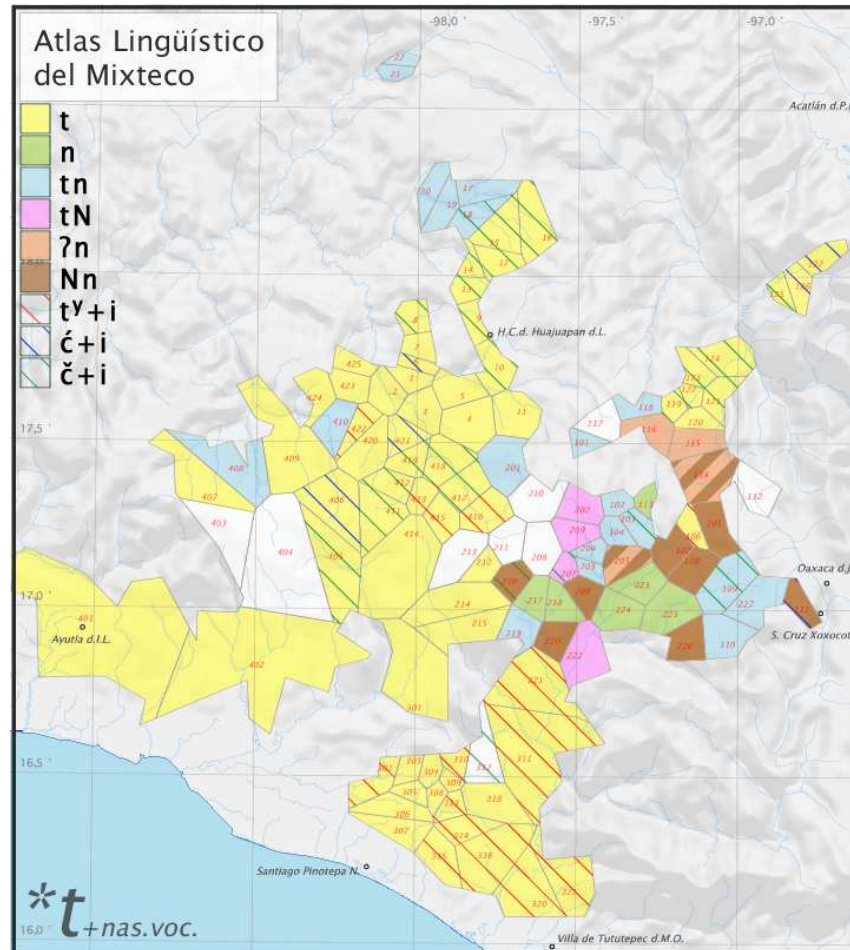


1. Topological density (TD)
=> *Polycentric, centrally distributed with M&CR (cf. 5 below) at the crossroad (NW)*
2. Structural density (SD)
=> *High SD: continuity & acute/gravis*
3. Relative Repleteness (RR)
=> *Sets of spirants of the gravis type*
4. Exemplification
=> *Root Onset*
5. Multiple and complex reference
=> *High degree of areal overlapping*

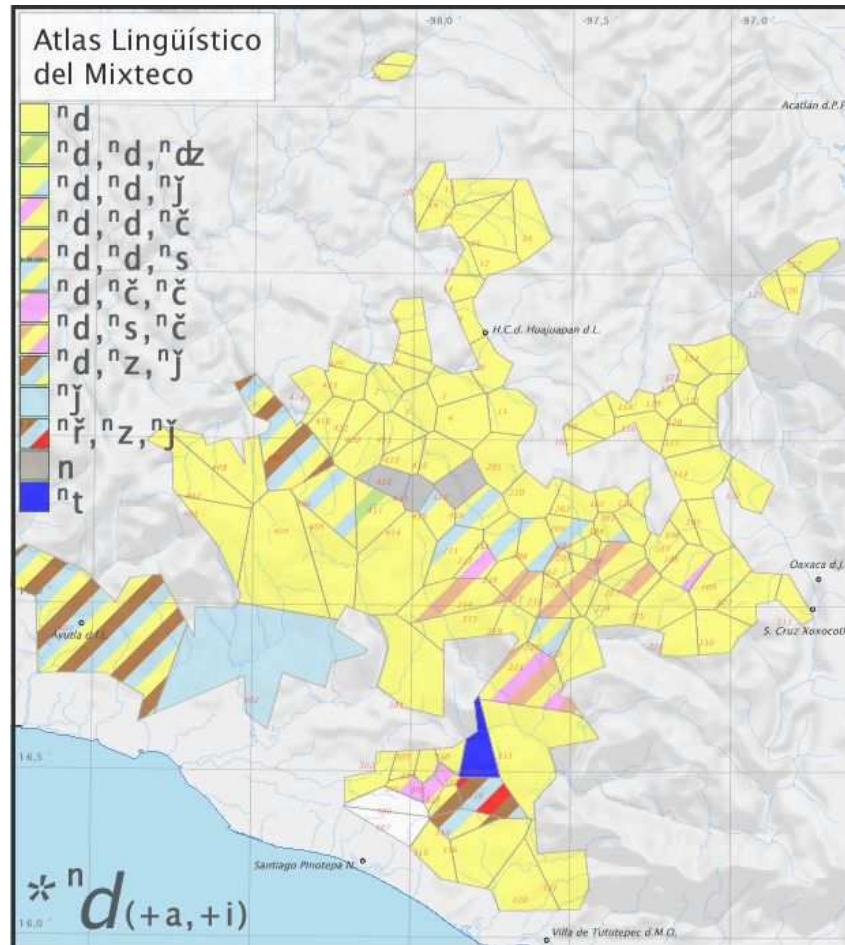
**nd* prenasalised stops: plain and palatalised



**tn* postnasalised stops: plain and palatalised



**nd* prenasalised stops: plain and palatalised



1. Topological density (TD)

=> *Stratified expansion or parallel change ?*

2. Structural density (SD)

=> *Palatality, voicing, continuity*

3. Relative Repleteness (RR)

=> *Palatalising sets, chains of affrication and assibilation*

4. Exemplification

=> *Prevocalic*

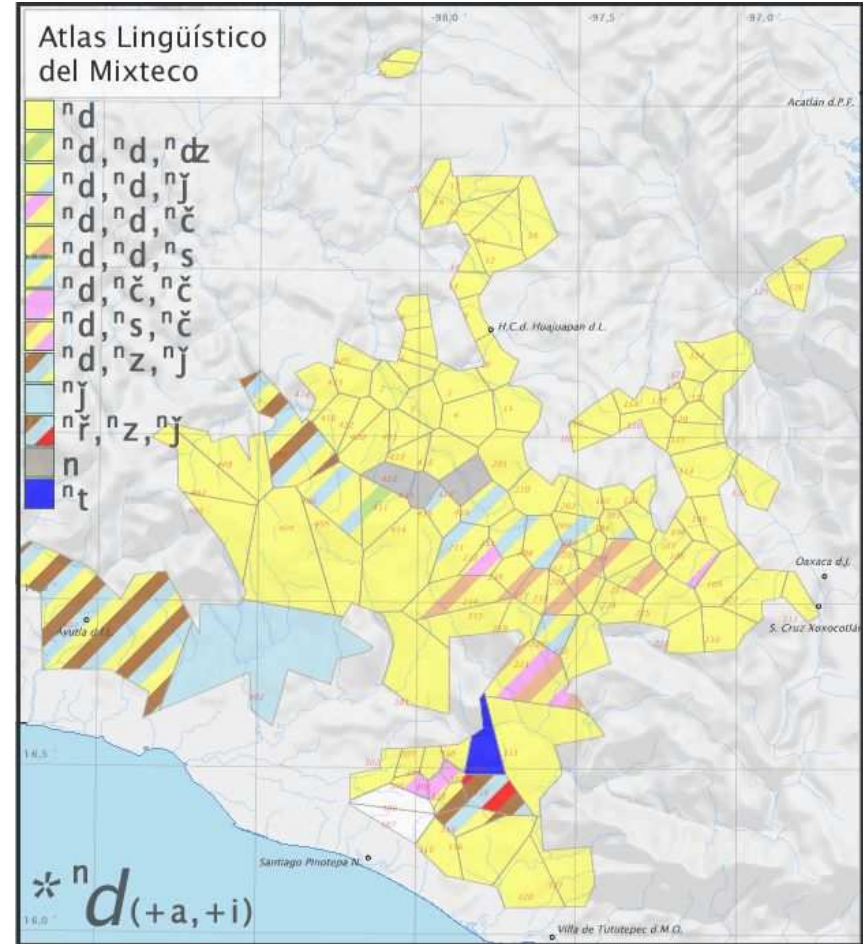
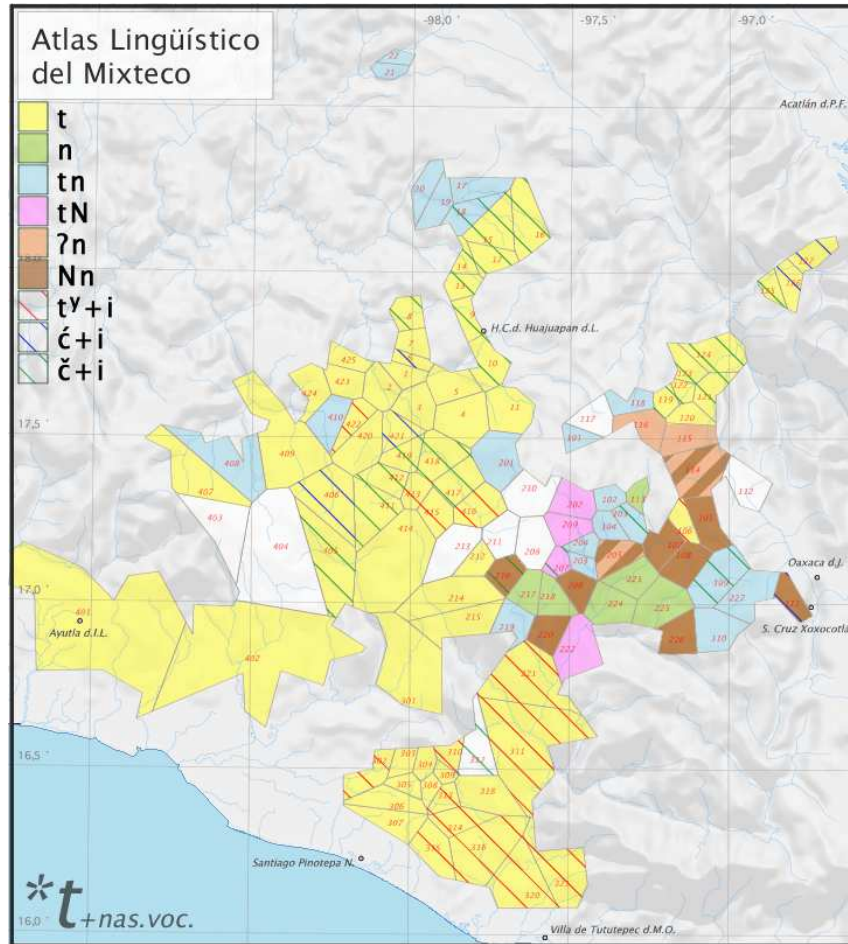
5. Multiple and complex reference (M&CR)

=> *A core area branching 3 extensions, or a patchwork of thoroughly different variables ?*

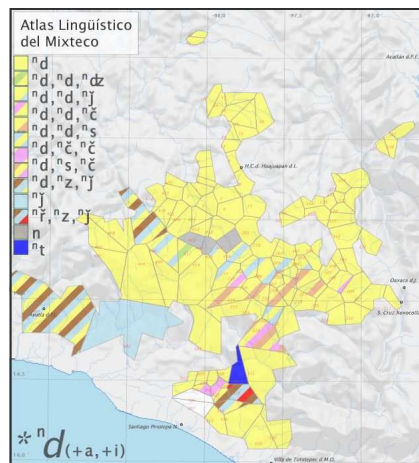
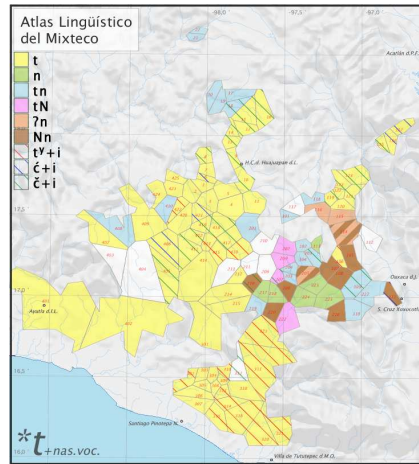
*e.g. if **n* > *nd*, instead of **nd* > *n**

As in Merlett's theory

Postnasalised stop $tn < *t / _V$ nasal versus prenasalised stop $*nd$ reflexes

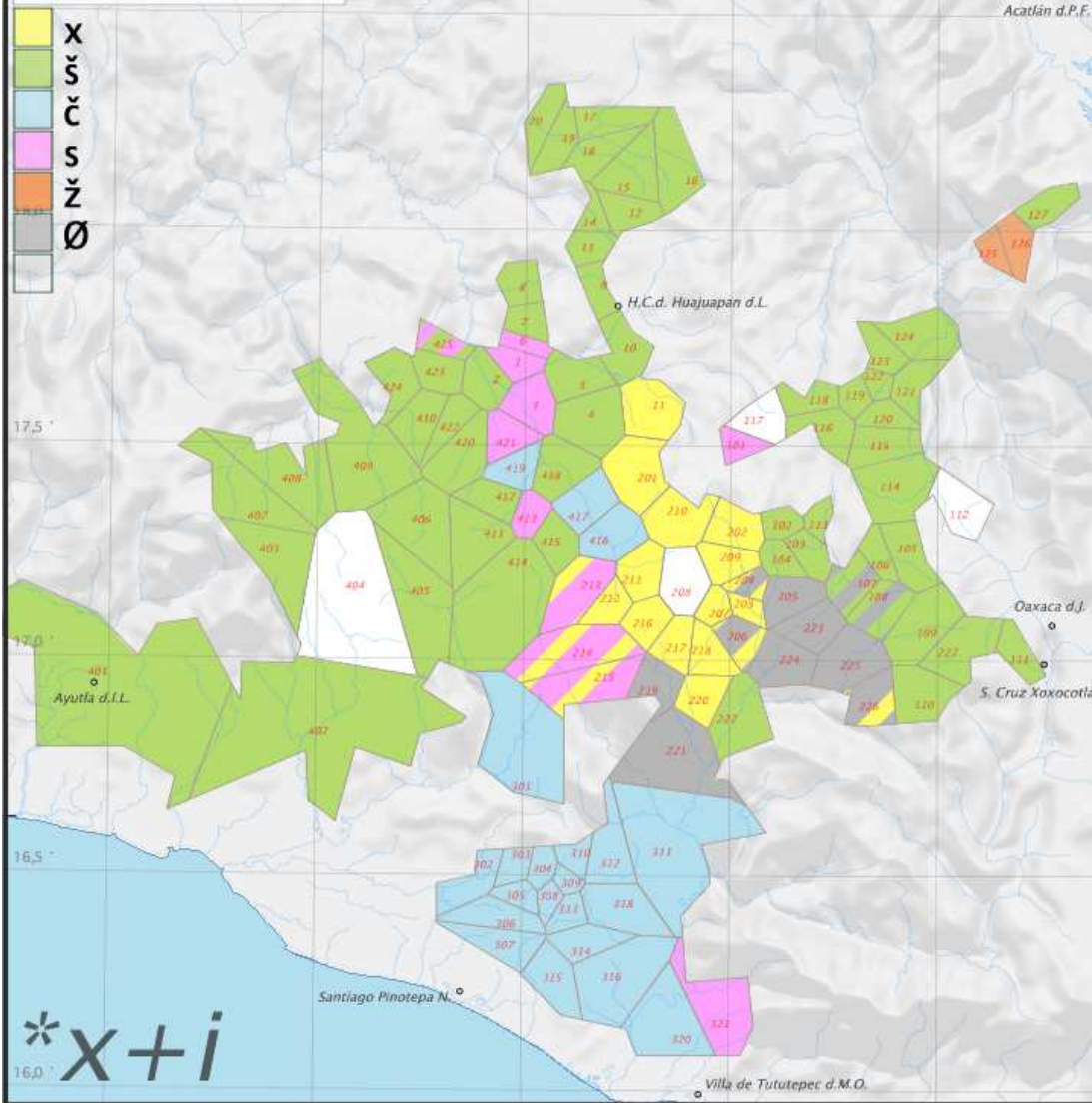


Postnasalised stop $tn < *t / _V$ nasal versus prenasalised stop $*nd$ reflexes

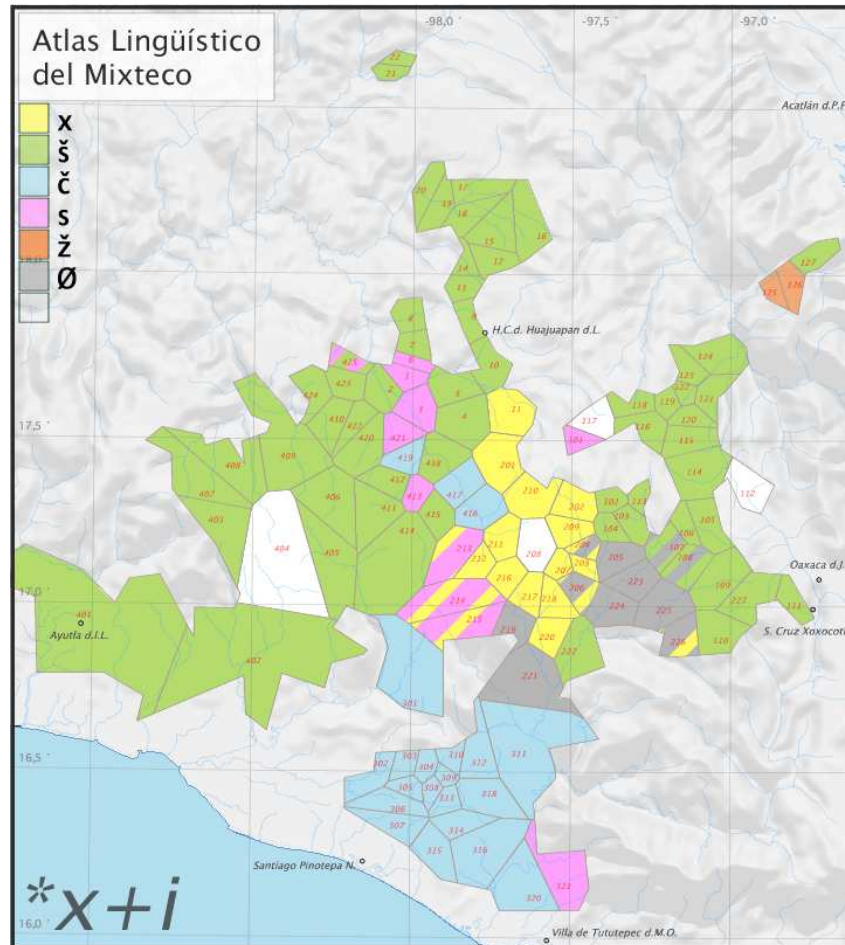


1. **Topological density (TD)**
=> *Asymmetry of tropism*
2. **Structural density (SD)**
=> *Asymmetry of nasal headedness*
3. **Relative Repleteness (RR)**
=> *Asymmetry of sensitivity to palatal properties*
4. **Exemplification**
=> *Prevocalic: strong nuclear interaction on the onset*
5. **Multiple and complex reference (M&CR)**
=> *N headedness versus V headedness : simplification or complexification of pseudo-clusters*

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Dorsal fricative *x



1. Topological density:
=> *Anti-Bartolian equipollence*
i.e. centre conservative, periphery innovative
2. Structural density :
+/- *Continuous palatalisation*
3. Relative repleteness
*Intricate patterns of subsequent depalatalisation *x > š > / _i*
4. Exemplification (sampling)
cf. next slide
5. multiple and complex reference
(intertwinned variables)

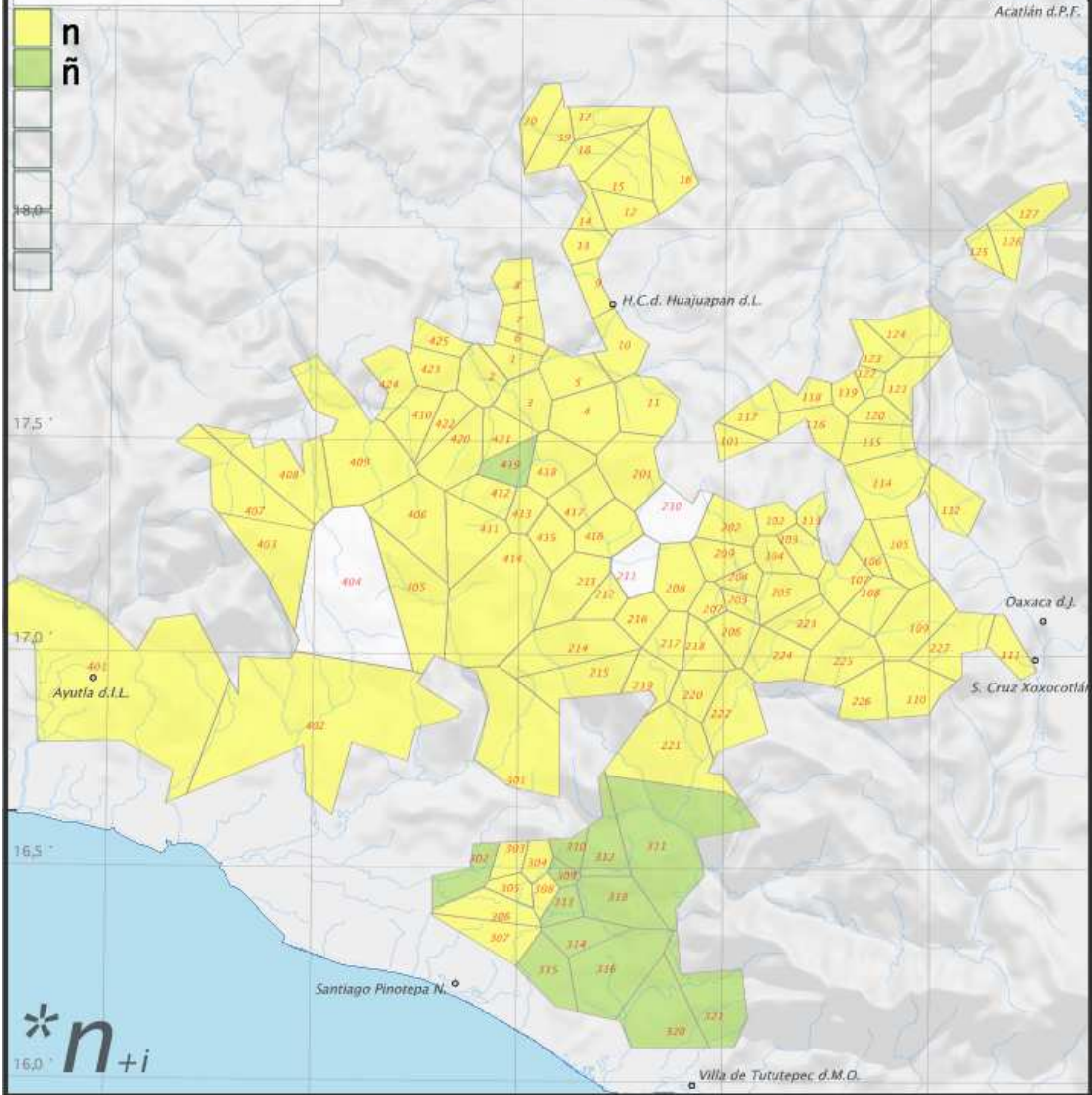
4. Exemplification (sampling)

=> Dorsal fricative *x

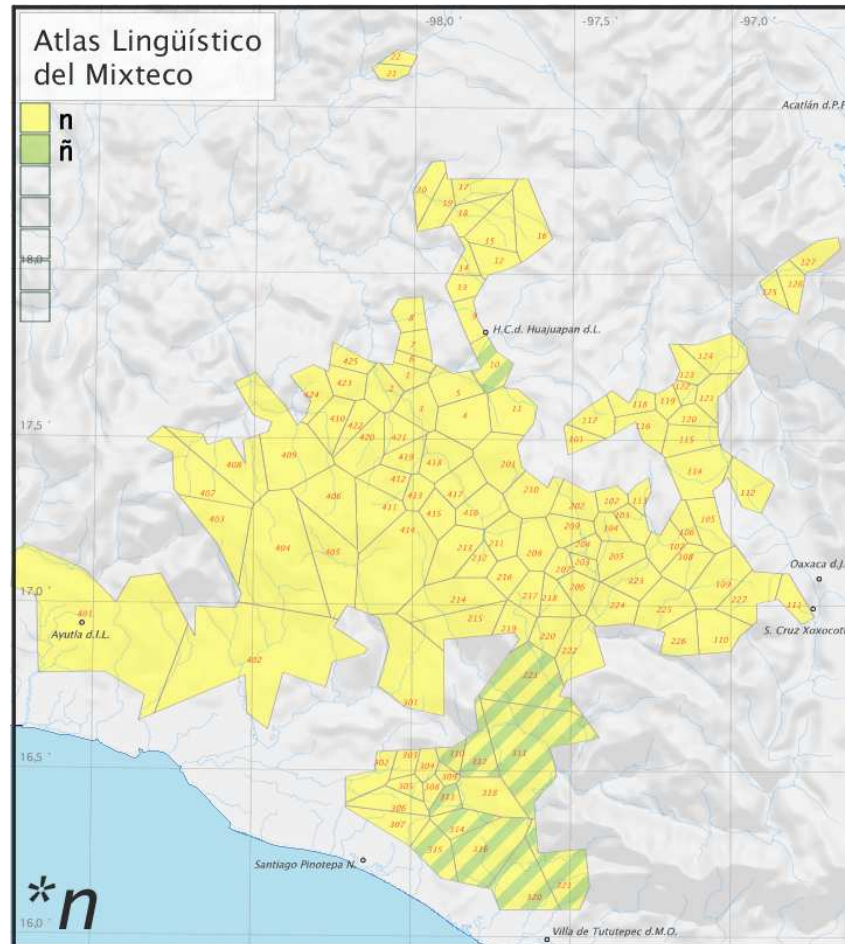
	15) tortilla tortilla	16) vomita vomits	17) flojo lazy	18) cama bed	19) comal griddle
<u>NE Alta</u>					
P-Mixtec	*sita?	* ⁿ duxɛ?	*suxɛ?	*xito	*xiyo?
Tepo	ɛita	ⁿ ɖusa	ɛusa	sito	siyo
Tida	ɛita	ⁿ ɖusa	ɛusɔ	šito	šoo/šio
Til	ɛita	[kɛɲi ɲiɲ]	[kuɛi]	šito	šio
Diux	ɛita	—	—	šito	šio
Nuxi	ɛita	—	—	šito =tapanco	šio/s ^y oo
Nuxa	ɛita	ⁿ ɖy ^u šɛ	ɛu ^š ɛ	sito	šio
TamJ	ɛita	ⁿ ɖy ^u šɛ	ɛu ^š ɛ	ito	io
Yuta	ɛita	—	—	ito	io
Peño	ɛítá	ⁿ ɖùsà	[kù?ù ⁿ ɖùù]	šítò =stretcher	šíó bridge
Este	ɛita	ⁿ ɖusa	[fɛɔ ky? ⁿ ɖu]	šito	šio

Num_PALM	cl_Xi	vis_answers
222	2	šito šizo šitNu ši to o kiši bāsi-ni uši
127	2	ito šio tšo o kiši uši
22	2	išto šoo šitnu što o waš waš-ta ũš
21	2	šito šroo baxa uši
15	2	šito šio šitu ⁹ što o waši waši uši
4	2	šito šoo šito wa ši
410	2	šito šiyo šitno što o kiši waši uši
422	2	šito šoo šito ši to o kiši bāsi ušü
420	2	šito šoo kiši bāsi uši
418	2	šitō šizo šito što o kiši bāsi ũxi
412	2	šito šyò še to o kiši bāsi ši
411	2	šito šyoo šitu e to o kiši bāsi ši
406	2	šitō šixYó što o kiši bāsi uši
415	2	ištō šizó čitù ũš tō o-nà kīšī-nà bāšī-nà ũsi
104	2	šito šio šitnu bāsi uši
409	2	išto šiyo šitu ši to o kiši waši uši
401	2	što šiyo kiši ša k'wāsi ũši
402	2	ni-to šio šitu ši to o kiši waši uši
425	2f1	šito šoo šito baxi xi-baxi-na ũšü
307	3	čito čio čitu čī to o bači bači uči
306	3	čito čiyó čitù čī to o kiči bači uči
302	3	čito čiyó čitù čī to o kiči wači uči
303	3	čito čiyó čitù čī to o kiči wači uči
304	3	čito čiyó čitù čī to o kiči wači uči
310	3	čito čiyó kiči bači uči
301	3	čito čiyó čitù čī to o kiči bači uči
311	3	čito čiyó čitù čī to o kiči bači uči
320	3	čito čiyó čitù kiči wači uči
316	3	čito čiyó čī to o kiči bači uči
315	3	čito čiyó čī to o kiči wači uči
419	3	šyoo kiši bāsi ũši
417	3	čito čio čitù ngiči bači uči
416	3	čito čioo čitù što o ku ngiča bat'yi uči
309	3	čito čiyó čitù čī to o kiči bači uči
308	3	čito čiyó čitù čī to o kiči uči
305	3	čito čiyó čī to o kiči bači uči
313	3	čito čiyó čī to o kiči wači uči
314	3	čito čiyó čitù čī to o kiči wači uči
318	3	čito čiyó čī to o kiči wači uči
312	3	čiyó kiši bači uči
1	4	šito šiyo šito kiši baxi uši
6	4	šito šio šito što o kiši bāsi ũš
101	4	šito šiyo šitnu što o keši waši uši
321	4	šito šiyo xitù čī to o kiši waši uši
3	4	šito šyoo šitō što o kiši bāsi ũš
421	4	šitō šizo što o kiši bāsi ušü
413	4	šito šyoo šitù što o kiši bāsi uši
215	4f1	šitō šyò šitù kīxī bāxī ũxi
213	4f1	šito šiyo kixi baxi uši

Atlas Lingüístico del Mixteco



Palatalising *n/_i



1. Topological density:
=> *Polarised equipollence in the Costa dialect*
2. Structural density :
=> *Low*
3. Relative repleteness
=> *Low*
4. Exemplification (sampling)
=> *See next slide*
5. multiple and complex reference
=> *Null*

Palatalising *n/_i

I

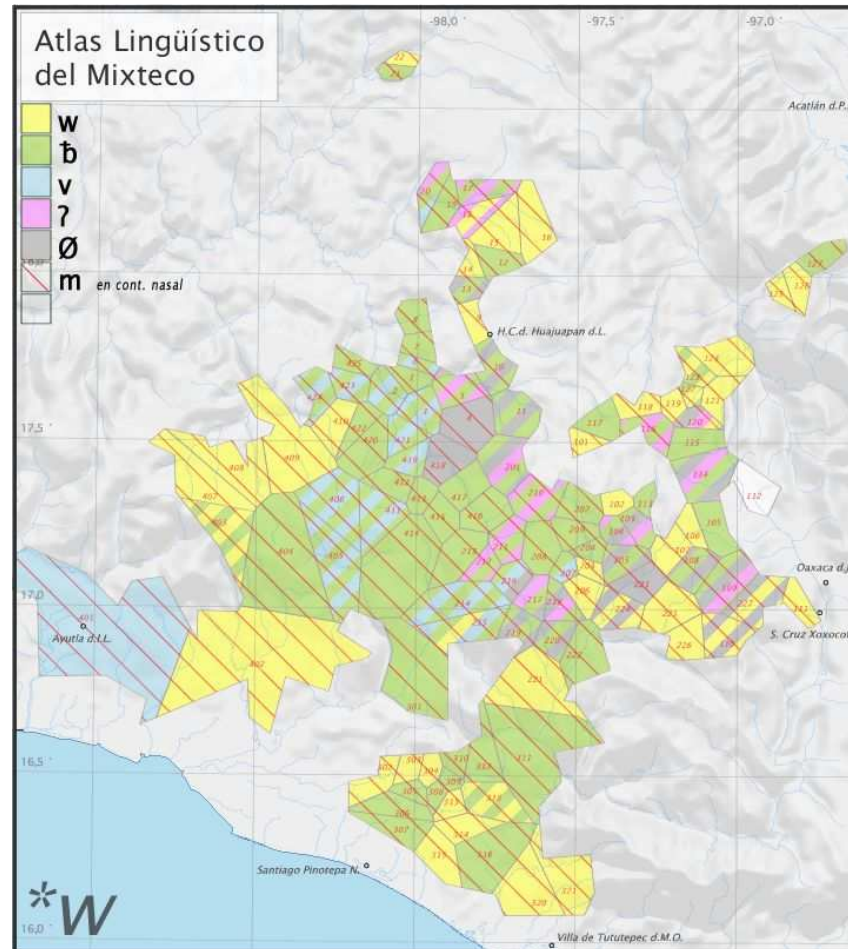
518

<u>Costa</u>	25) hermano de h. man's brother	26) tres three	27) diente tooth	28) cinco five	29) amargo bitter
P-Mixtec	*yeni	*oni	*no'o	*o'o	*owe
Zac	fiɲi	ɯni	ny'u/nɔ'o	ɯ'u	uɓa
Sayu	yɛfi	ɯfi	ny'u	ɯ'u	uwa
Tept	fiɲi	ɯni	ny'u	ɯ'u	uwa
Atoy	yɛni	ɯni	ny'u	ɯ'u	uwa
Jicy	yɛni	ɯni	ny'u	ɯ'u	uɓa
Jict	yɛni	ɯni	ny'u	ɯ'u	uɓa
PinN	yɛni	ɯni	ny'u	ɯ'u	ua
PinL	yɛni	ɯni	ny'u	ɯ'u	uwa
Colo	yɛfi	ɯfi	ny'u	ɯ'u	uɓa

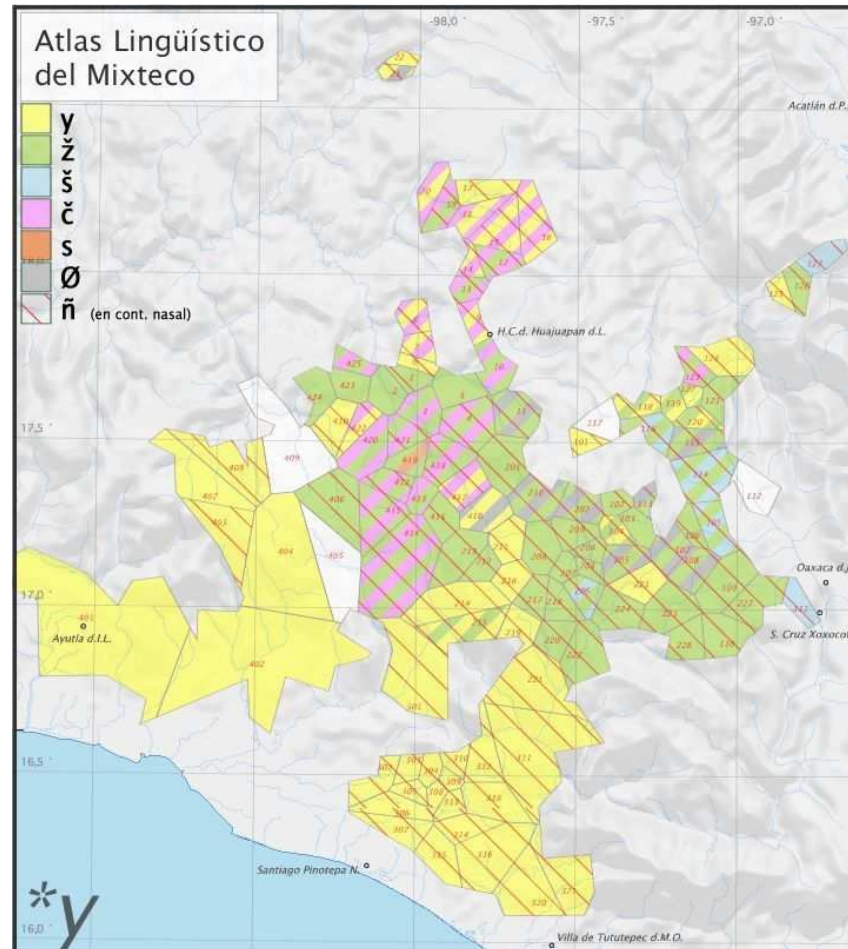
Num_PALM	cl_Ni	vis_answers
4	1	ñani uni ñunu nuni una
410	1	ñani uni ñono kini nuni una ti nana kuni k'wino nina
422	1	ñani oni yona kini kaa nuni una ti nana toni na ku ino nuna
420	1	ñani uni ñunu nuni una na suna
421	1	7uni ñunu kini nuni 7una či nana toni ku tuni 7ini žuku 7inu nuna
418	1	ñani 7oni žunù kini kaa noni 7una či nana "či7e toni žuku 7i_nu_ nuna
412	1	ñāñī 7ūni ñūnū kīnī nūni 7una či nana tūni zuki inu nūna
417	1	uni nuni una kunu
413	1	ñani uni ñunu kini nuni una t'vi nana tuni yuku k'wino nuna
411	1	ñani ūni ñūū kini nūni 7una či nana tuni žiku inu nuna
406	1	ñani ūni ñūUnū kini nuUnī 7ona či nana tōni kuū k'wīnu nuna
415	1	žāni 7ūni žūnū kīnī nūnī 7ūnā ti nānā "dā7yā tūni dā kūnī-yō žūkū nū nūnāyā
416	1	ñani uni ñunu kini nuni una ti nana tuni "g'wino nuna
104	1	uni ñunu nuni una
209	1	ñani uni ñunu kini nuni una či nana k'wini inu nune
213	1	ñani uni žunu nuni una kuni none
204	1	ñani uni ñunu nuni una ku7ini
208	1	ñani uni ñunu nuni kuni
108	1	uni ñunu nuni una kini
212	1	ñāñī 7ūni ñūnu kīnī nūni 7ūnā ti nānā tūni kūni žūkū inū nūnē
205	1	ñani uni nuni una
203	1	ñani uni ñunu ka kini nuni una ti nana kune inu nune
207	1	ñani uni ñunu kini nuni una ti nana k'wini inu nune
216	1	ñani unī ñūnu kini nūni unā t' nana Nnuni kuni inu nune
206	1	ñani uni ñunu nuni una ti nana ni ini inu nune
223	1	uni ñono nuni una xini
217	1	ñanī unī ñūnu kini nūnī unā t' nana k'wā7á tunī kunī inu nūñā
218	1	ñani uni ñunu nuni una t' nana kuni inu nuña
214	1	ñāñī 7ūni ñūnū kīnī nūni 7ūnā ti nānā tūnī kūnī-hi yūkū 7inū nūnē
220	1	ñani uni ñuna nuni una t' nana Nnuni "de7e ti kuni inu nuña
308	1	yani uni yunu nuni una t' nana tuni inu nuna
305	1	yani uni yono kini kaa nuni una ti nana tuni inu nuna
221	1	yeni uni yono kini nuni una t' nana tuni kuni ino nune
409	1	ñani uni ñunu kini nuni una ti nana tuni kuni kunu nuna
401	1	ñani uni ñunu? kini nuni un'ya ti nana? kuni kūnu? nūn'ā?
402	1	ñani uni yunu kini nuni una ti nana kuni "di kunu nuna
302	2	yani unī yunu kīnī nūnī unā ti nana tunī yuu kunu nuna
310	2	unī yunu n'ñī unā luñā
311	2	ñāñī unī ñūnu kini nūnī unā t' nana tunī inu
321	2	ñāñī unī yono nūñī unā t' nana tunī "da ino nuñā
320	2	ñāñī unī yono kīnī nūñī unā t' nana tunī ino nuñā
316	2	yāñī unī yono kīnī kaa nūñī unā t' nana tunī ino ta nuñā
315	2	yāñī unī yono kīnī nūñī unā t' nana tunī ino nuñā
419	2	ñāñī 7ūñī nūñī nuna
309	2	yāñī unī yunu kīnī nūñī unā t' nana tunī inu nuñā
313	2	yāñī unī yono kīnī kaa nūñī unā t' nana tunī ino nuñā
314	2	yāñī unī yono kīnī nūñī unā t' nana tunī ino
318	2	yāñī unī yono kīnī nūñī unā t' nana tunī ino nuñā

***w disjunctive spirantisation *versus* nasalisation, instead,
shows complex sets of functions & values**

(NB: a set of clear-cut values, but many functions)

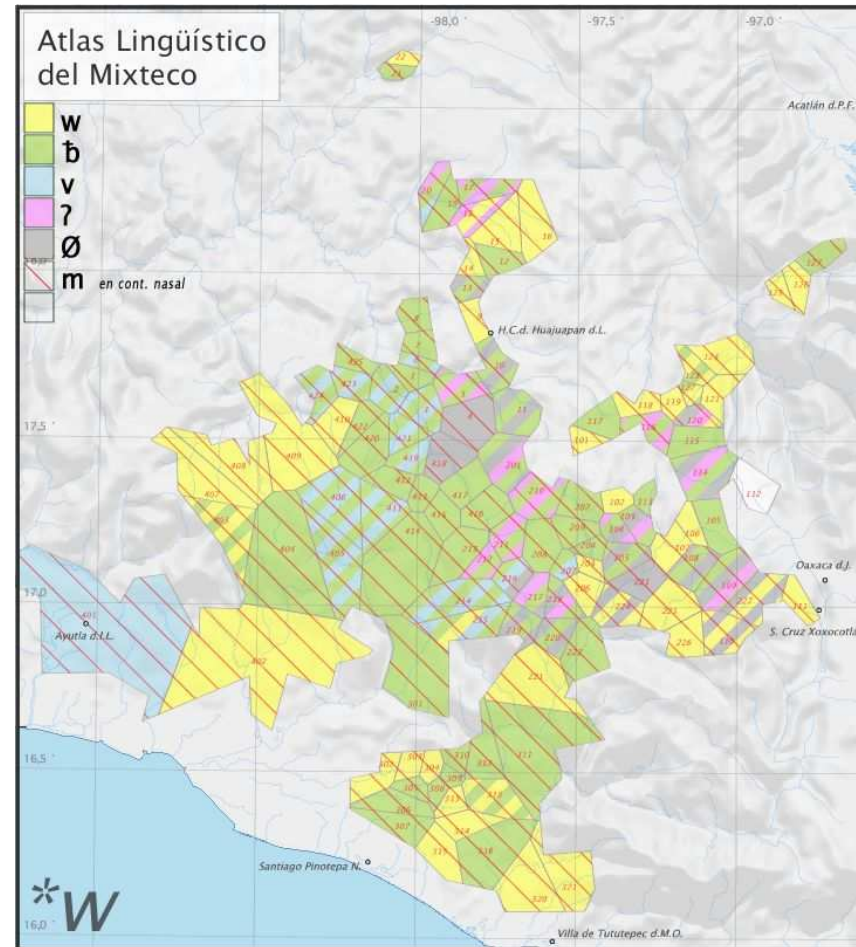
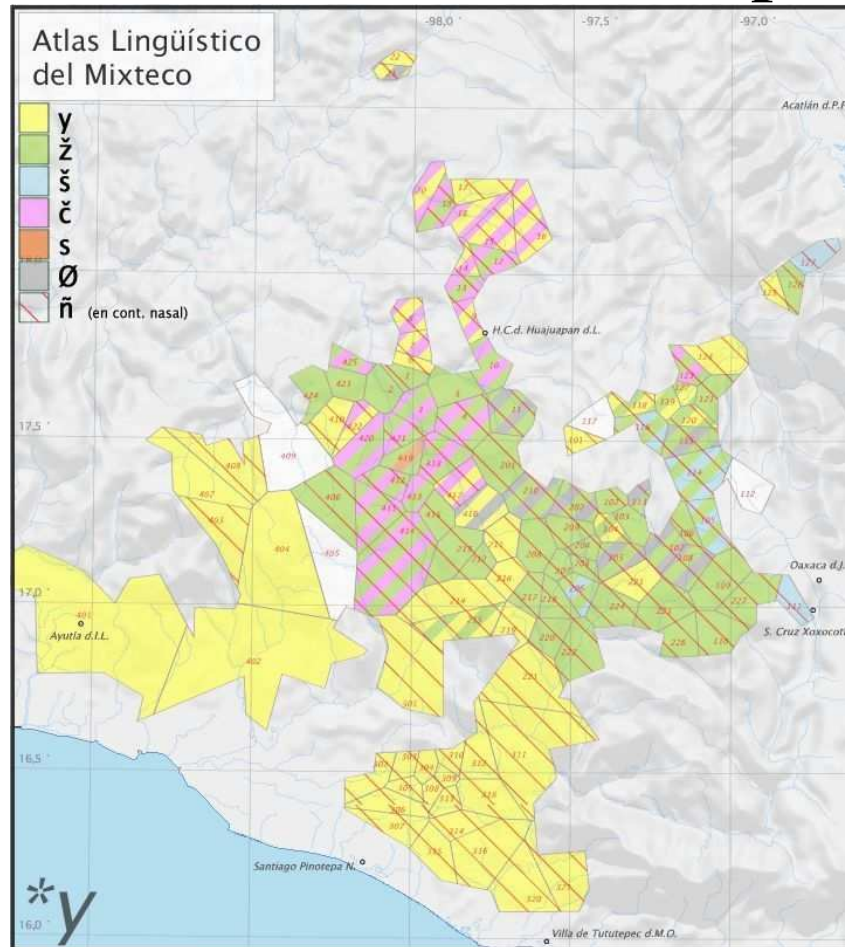


**Idem with *y disjunctive spirantisation versus nasalisation
But with more values (+/- continuous & +/- voiced affricates
and hushing/hissing obstruents)**

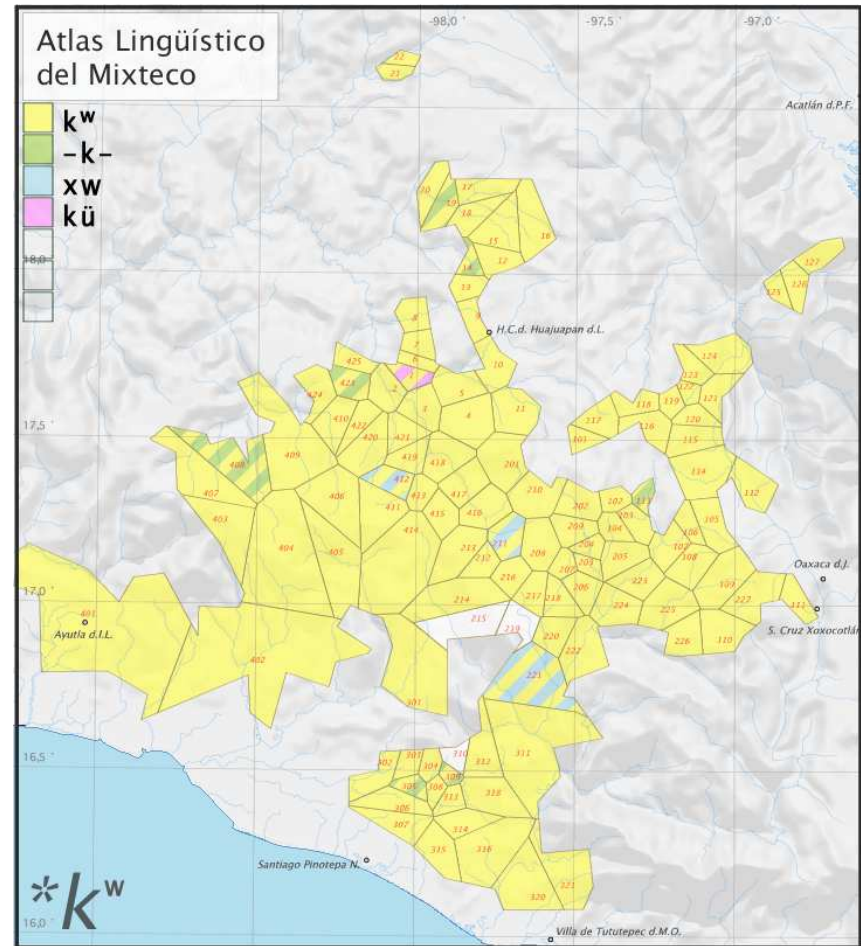
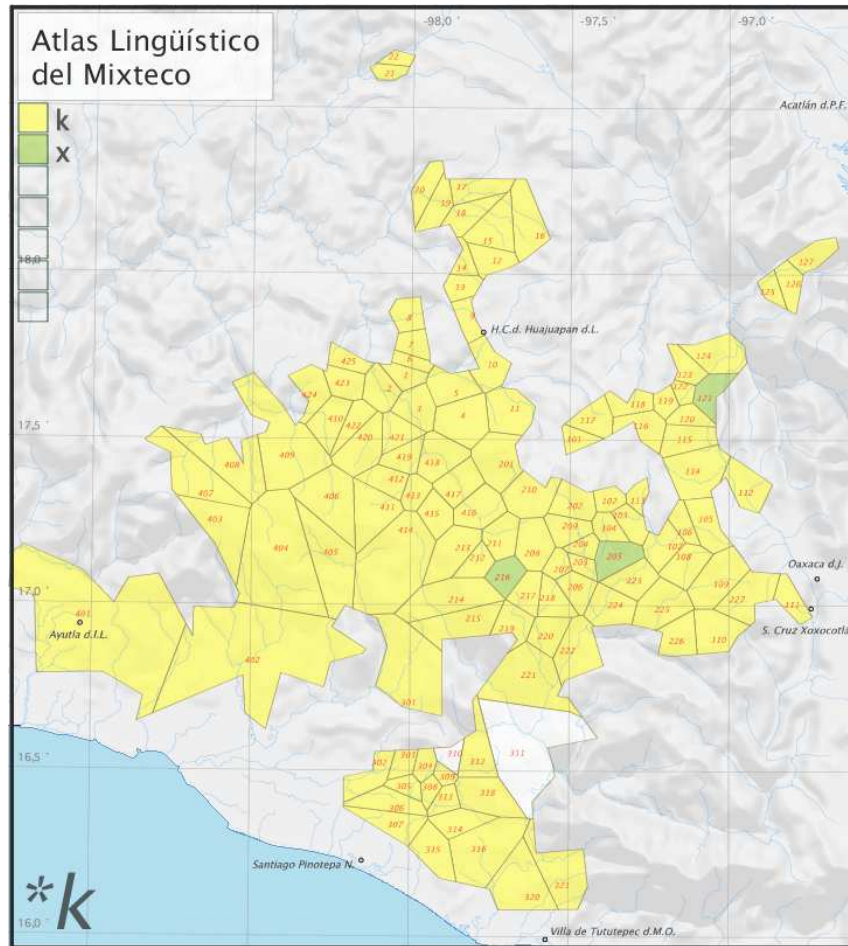


Approximants: *y and *w

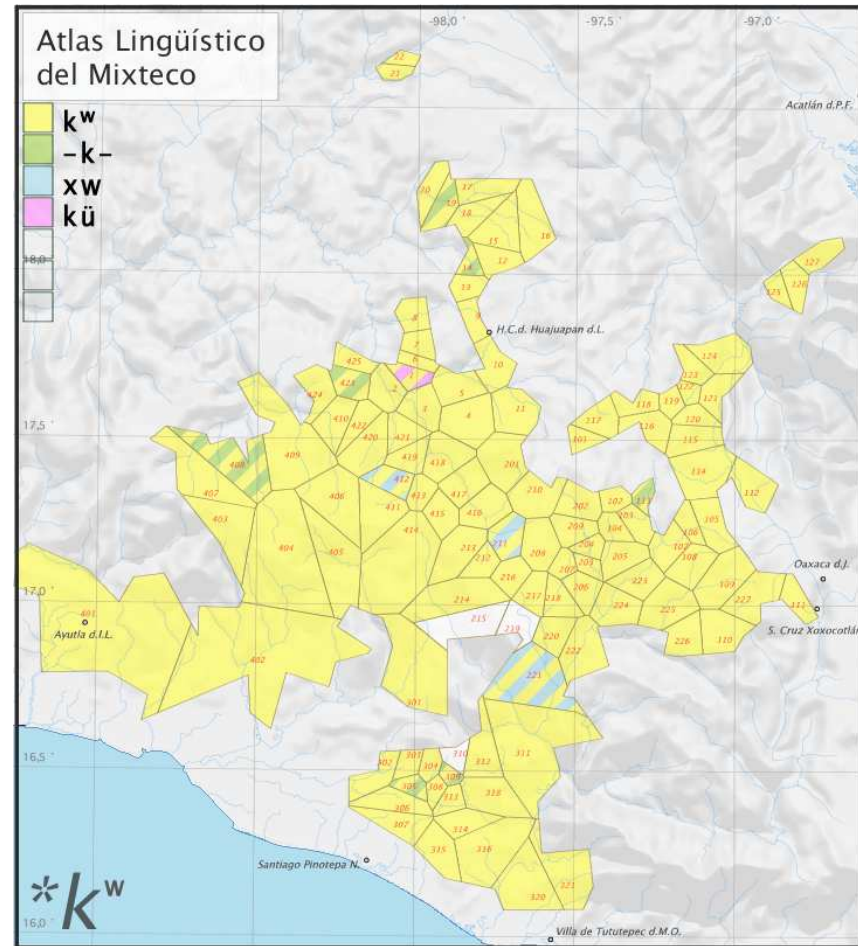
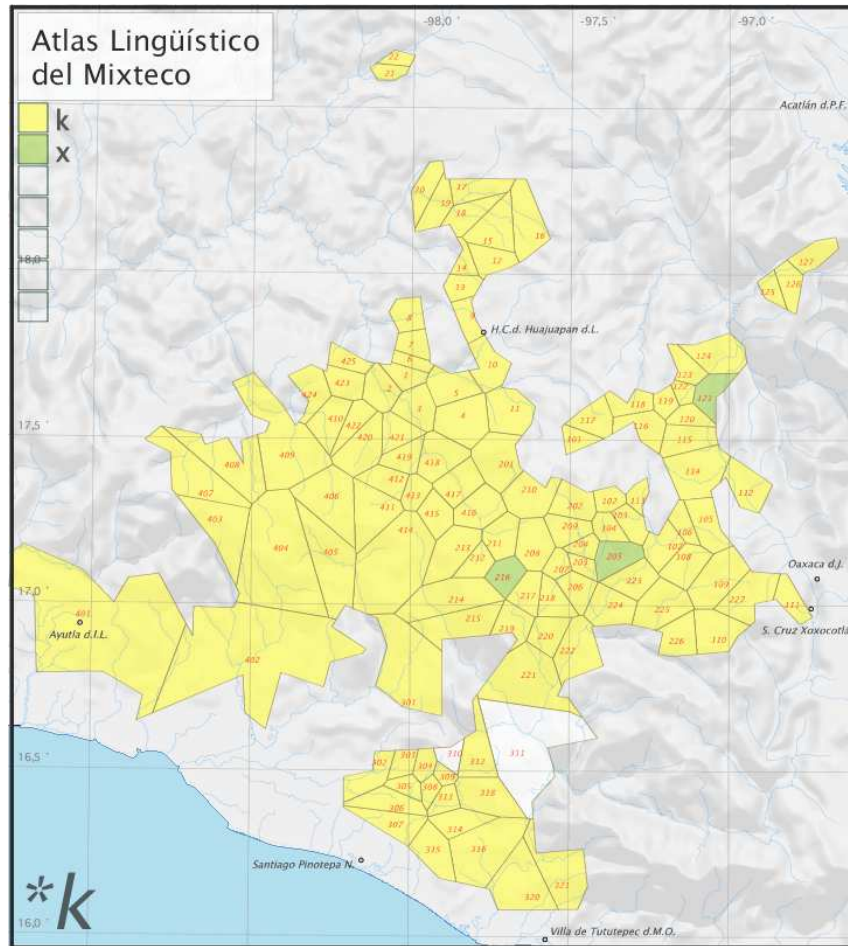
Disjunctive function/value density & relative repletiness



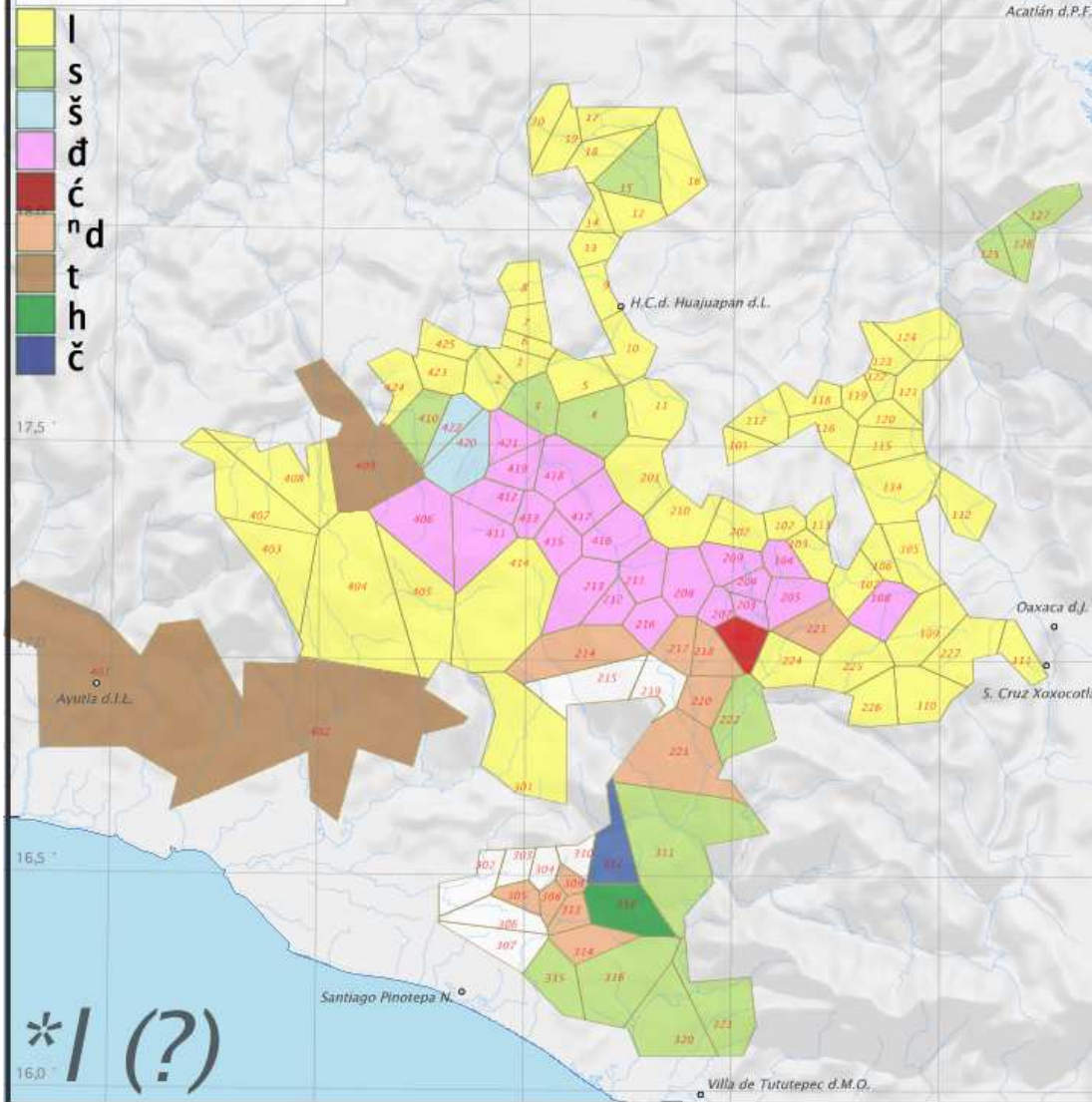
Dorsal stops [+/-Labial]



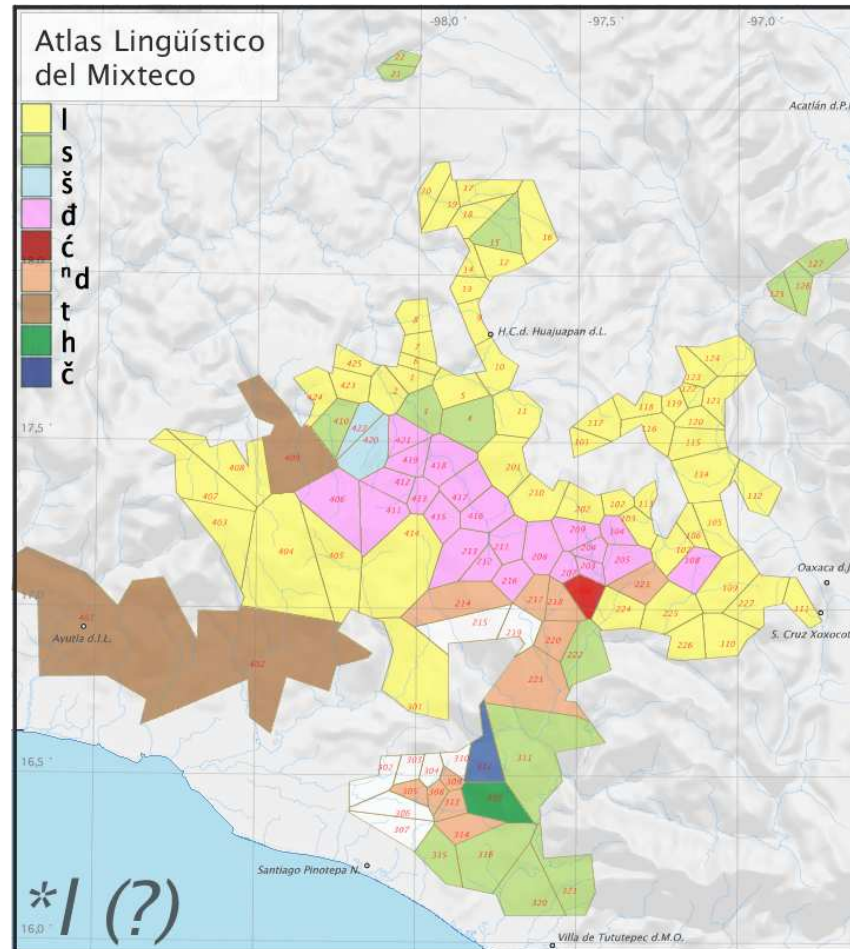
Dorsal stops [+/-Labial]



Atlas Lingüístico del Mixteco



**ndy* according to Rensch, **l* according to Josserand
 => **ndy* would be more accurate if it did not resort to...Other
 lemma => **s/_u* as an alternative



	5) pluma feather	6) cola tail	7) cera wax	8) nariz nose	9) palabra word
<u>NE Alta</u>					
P-Mixtec	*towj	*lu'wəʔ	*yuwəʔ	*sitjʔ	*to'q
Tepo	tnymi	əy'mə	ɲymə	əitni	tny'y
Tida	tnyy	əy'a/əy'mə	ɲywa/ɲya	əitni	tny'y
Til	tnyy	əy'a	ɲya/ɲya	əitni	tny'y
Diux	tnyy	əy'a	ɲya	əitni	tny'y
Nuxi	tɲyy	dy'a	ɲymə	—	tʲy'q'q
Nuxa	tʲyy	əy'mə/əy'wə	ɲymə/ɲywa	əiti	tʲy'y
TamJ	Nnɨmɨ	əy'mə	ɲymə	əiNni	Nny'y
Yuta	Nnyimi	ly'mə	ɲymə	əi'Nni	Nny'y
Peño	tnúmì	ly'mə	ɲúmá	əitni	tny'y
Este	tymi	ly'mə	ɲymə	əitni	ty'y

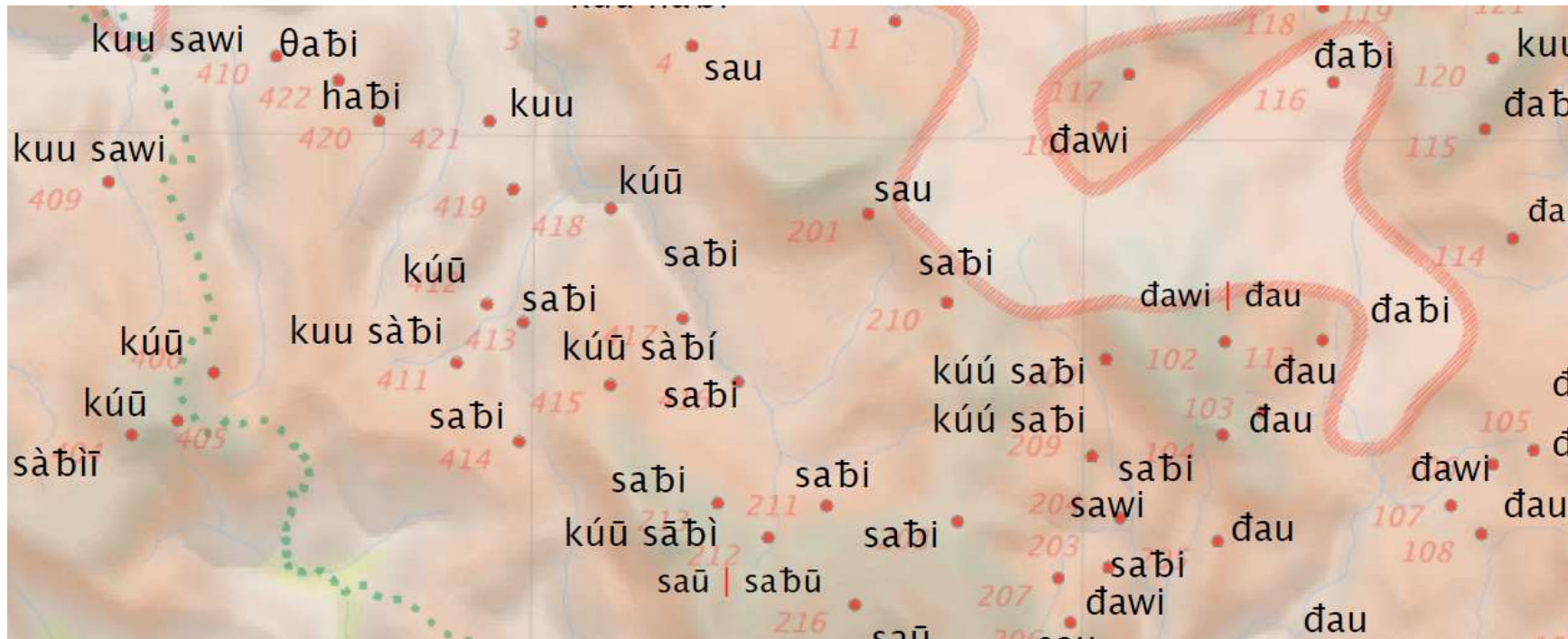
Num_PALM	cl_L	vis_answers
214	1	sú7mà tì nānā ċi še7è sò7ò tì sū7mā sǎā šā'dū lǎx'vā lɪ7w lūlɪ nāk'wā
220	1	su7ma tɪ nana ċi še7e so7o la su7ma saa sa7ba ti šeše laxa lulu lak'wa bilu
221	1	su7me tɪ nana ċixi še7ye so7o tɪ su7ma saa sa7ba ċelu te šeše lax'va lak'wa bilu
409	1	tì nana tìšì še7e so7o tì so7ma saa sa7wa ša'du laša lo7o lak'wa wɪlu
401	1	su7ma7 tì nana7 še7e7 so7o tì sū7ma saa sa7wa šalu 'dašā7 'dii7 lūlū 'dak'wā7
312	1	ču7ma še7e so7o čaa ča7ba lu7lu lak'wa milu
310	2	su7ma tɪyɪçi še7e so7o saa sa7ba lu7lu 'dak'wa
404	2	sú7ma tì sū7mà sǎā bɪlú
403	2	sí7ma tì nana sò7o saa sa7wa lo7o
407	2	sí7ma še7e so7o tì sí7ma saa sa7wa ša'di 'dasa 'di7wi lo7o lak'wa
408	2	sí7ma tì nana k'wa7a še7e so7o tì sí7ma saa sa7wa ša'di 'dasa 'di7wi lo7o lak'wa
20	2	sì nānā ċikā lé7è dò7ò sɪ dū7mā lǎā lǎ'du sɪù 'dāsā 'nɪ7ɪ 'dāk'wā
321	2	su7ma tɪ nana tɪ še7e so7o tɪ su7ma saa sa7wa ča šaša 'dasa 'dɪɪ 'dak'wa
316	2	su7ma tɪ nana še7e so7o tɪ su7ma saa sa7ba čaša 'dača 'dɪ7ɪɪ lu7lu 'dak'wa
315	2	su7ma tɪ nana tɪyɪçi še7e so7o tɪ su7ma saa 'dača 'dɪ7wɪ lu7lu 'dak'wa
410	2	sí7ma tì nana so7o tì su7ma saa sa7wa ša'du 'di7wi lo7o lak'wa
203	2	su7ma tì nana ċi še7e so7o tì su7ma tì saa sa7ba luli 'dak'wa bilu
308	2	su7ma tɪ nana še7e so7o tɪ su7ma saa sa7ba 'dača 'dɪɪ lu7lu 'dak'wa
313	2	su7ma tɪ nana ča7a še7e so7o tɪ su7ma saa sa7wa 'dača 'dɪ7wɪ lu7lu 'dak'wa milu
314	2	su7ma tɪ nana še7e so7o tɪ su7ma saa sa7wa 'dača 'dɪ7wɪ lu7lu 'dak'wa
402	2	su7ma tì nana še7e so7o tì su7ma saa sa7wa ša'du 'daša 'di7wi lulu 'dak'wa
320	3	su7ma tɪ nana še7e so7o tɪ su7ma saa sa7wa šaša 'dača 'dɪ7wɪ 'dak'wa
406	3	ɪ nana ċiši še7e sò7ó so7ma saa sa7va ša'du 'i7i lo7o 'daAk'wa
102	4	du7a tì nana ċi de7e do7o tì du7a tì daa de7e t'yu 'dasa luči 'dak'wa wɪlu
113	4	du7a tì de7ye do7o tì daa luči 'dak'wa bilu
103	4	du7a tɪ nana ċis de7e do7o tu7a daa 'dute de7e čuu 'daša luči 'dak'wa
107	4	du7me tɪ nana le7e do7o ċi daa le'du de7e t'yu 'daša 'dɪ7wɪ luči 'dak'wa wɪlu
114	4	du7a tì de7e do7o tì daa luči 'dak'wa bilu
115	4	du7a tì de7ñu do7o tì daa luči 'dak'wa bilu
101	4	du7ma da7i do7o te du7ma daa da7va sa'du 'dute daa 'de7vi 'dak'wa
118	4	du7ma tì nana tì de7e do7o 'di du7ma daa da7a 'ju 'dasa 'de7we xa 'dak'wa wɪlu
119	4	du7ma tì nana tika de7e do7o ċi řu7ma daa 'di la7wa da7a 'di7wi luči 'řak'wa wɪlu
122	4	du7ma tì nana tika da7bi do7o 'di du7ma tì daa la7wa leka 'dak'wa bilu
124	4	du7ma tì nana tika de7e do7o 'di du7ma daa ka da7wa da7a 'dasa 'di7wi luči 'dak'wa bilu
121	4	du7ma tì nana tika da7wi do7o 'di du7ma tì daa 'di la7wa 'du7a da7a luči 'dak'wa wɪlu
120	4	du7ma tì nana tì de7e do7o ċi řu7ma tì daa tì le7a 'du7a da7a 'di7i luči 'dak'wa wɪlu
225	4	du7me tɪ ana ċi de7e do7o tɪ lu7me ċi daa te de7e ċi 'dase 'dɪ7wɪ luči 'dak'wa wɪlu
224	4	du7me tɪ ana ċi de7e do7o koo du7me ċi daa la7wa te de7e ċi 'dai luči wɪlu
125	4	du7me trana ma dɪ7i tu7me laa sa7wa da'du 'dute de7e lɪ7'di 'dak'wa
22	4	du7ma ɪ nana ċiši de7e ɪ du7ma čaa da7wa da'du te do7o 'daša 'jɪ7i 'dak'wa
21	4	du7ma sa7a ċi daa ċi lanku 'dak'wa
104	4	du7a de7e do7o ċili daa luči 'dak'wa bilu
205	4	du7ma ċi de7e do7o daa da7wa luli 'dak'wa bilu
206	4	du7ma tì nana ċi de7e do7o tì du7ma tì daa da7wa se'du de7e 'di7wi luli 'dak'wa wɪlu
223	4	du7ma ċi da7i do7o ċi daa luči 'dak'wa bilu
9	5	ɪ nama ċiko le7e do7o ɪ do7ma ɪ laa ɪ la7wa le'dyu te de7e ɪ 'dasa 'sɪ7wi 'dak'wa
307	6	su7ma tì nana tì še7e so7o tì su7ma saa sa7ba ša'du čaša 'dača 'di7bi lu7lu 'dak'wa
306	6	su7ma tì nana še7e so7o tì su7ma saa sa7ba ša'du čaša 'dača 'dii lu7lu 'dak'wa
302	6	su7ma tì nana še7e so7o tì su7ma saa ša'du 'dača 'di7wi lu7lu 'dak'wa miču

*l (?)

4. Exemplification 5. Multiple and complex reference (intertwinned or *lexically disjunctive variables*)

NE Alta						No. Baja					
	5) pluma feather	6) cola tail	7) cera wax	8) nariz nose	9) palab word		5) pluma feather	6) cola tail	7) cera wax	8) nariz nose	9) palab word
P-Mixtec	*towɨ	*luʔweʔ	*yuweʔ	*sitiʔ	*toʔq	P-Mixtec	*towɨ	*luʔweʔ	*yuweʔ	*sitiʔ	*toʔq
Tepo	tnymi	əyʔmə	fiymə	əitni	tnyʔy	Mont	tqmɨ	[ʰdoʔo]	fiymə	ʃiti	tqʔq
Tida	tnyy	əyʔə/əyʔmə	fiywe/fiyə	əitni	tnyʔy	Nuch	tqmɨ	[ʰdoʔo]	yimə	ʃiti	tqʔq
Til	tnyy	əyʔə	ʃywe/fiyə	əitni	tnyʔy	Aten	tqmɨ	[ʰdoʔo]	fiymə	ʃiti	tyʔy/tqʔq
Diux	tnyy	əyʔə	fiywe	əitni	tnyʔy	Yucq	tymi	[ʰdoʔo]	fiymə	siʰti	tqʔq
Nuxi	tʃiyy	dyʔə	fiymə	—	tʃyʔq	Yucñ	tqmɨ	[ʰdoʔo]	fiymə	hiti	tyʔy
Nuxa	tʃiyy	əyʔmə/əyʔwə	fiymə/ʃywe	əiti	tʃyʔy	Guad	tymi	[ʰdoʔo]	yimə	ʃiʃi	tʃyʔy
TamJ	Nniɨmɨ	əyʔmə	fiymə	əiNni	Nnyʔy	Flor	tqmɨ	[ʰdoʔo]	Nfiymə	ʃiti	[kaʔyu]
Yuta	Nnyɨmɨ	lyʔmə	fiymə	əiʔNni	Nnyʔy	Amat	tymi	[ʰdoʔo]	fiymə	əiči	tyʔy
Peŋo	tnɨmɨ	lyʔmə	fiymə	əiʃtnɨ	tnyʔy	Zap	tqmɨ	[ʰdoʔo]	fiymə	əiči	—
Este	tymi	lyʔmə	fiymə	əitni	tyʔy						

5. multiple and complex reference (intertwinned variables)





Prospects for *Computational Geolinguistics*

In geolinguistics, the relevance of topological & structural density, the design of relative repleteness, prototypicality of sampling, the overlapping of multiple and complex reference between areas and structural features make up a Space-Time dimension of their own, though strongly loaded with hints pointing at historical and spatial patterns and trends.

Far from being obsolete, spatial linguistics, i.e. dialectology or diasystemics may turn out to be one of the most promising field of research for linguistic typology and interdisciplinary research, addressing general linguistics as much as history, archaeology, social geography and environmental studies. Especially if *diasystemics* provide insights on *areal patterns* through *Computational Geolinguistics*, cartographic design and representation of intrinsic value of linguistic categories and paradigms.

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