

INGEIS RADIOCARBON LABORATORY DATES IVRoberto Cordero^{1,2} • Sonia Lanzelotti³ • Héctor Panarello¹**INTRODUCTION**

We present here the results of dating of 80 archaeological and paleoenvironmental samples from Argentina and Uruguay, processed between 1986 and 1988 by M A Albero and M A Gonzalez. Series of samples and single samples are grouped by province and then by locality or archeological site, from north to south. See sample location maps for details.

Procedures for sample pretreatment, counting, statistical analysis, and age calculation were essentially the same as previously described by Albero and Angiolini (1985). Results are reported as conventional ¹⁴C dates in years before AD 1950. They are corrected for isotopic fractionation. ¹⁴C contents of some paleoenvironmental samples are expressed in percent modern carbon (pMC).

ARCHAEOLOGICAL SAMPLES**República Argentina***Jujuy**A) La Quiaca Vieja Series*

AC-1095. La Quiaca Vieja 1 **1570 ± 110**
Depth 0.38 m $\delta^{13}\text{C} = -21.4 \pm 0.2\text{‰}$

AC-1096. La Quiaca Vieja 2 **1780 ± 100**
Depth 0.50 m

AC-1097. La Quiaca Vieja 3 **1810 ± 140**
Depth 0.54 m

Charcoal samples from La Quiaca Vieja (22°08'S 65°35'W; 3450 m asl). Collected and submitted in 1986 by P Krapovickas.

B) Yavi Series

AC-1088. Yavi 1 **9760 ± 160**
Depth 0.53 m $\delta^{13}\text{C} = -25.0 \pm 0.2\text{‰}$

AC-1093. Yavi 2 **9480 ± 220**
Depth 0.64 m

Charcoal samples from Yavi (22°08'S, 65°28'W; 3440 m asl). Collected and submitted in 1986 by P Krapovickas.

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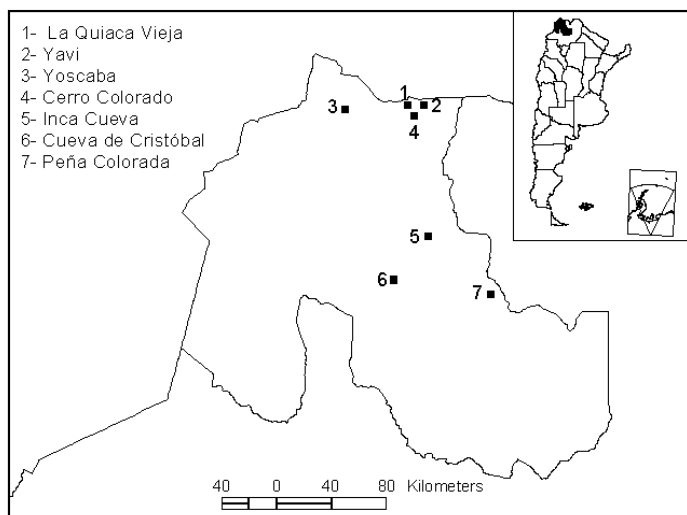


Figure 1 Jujuy sample sites

*C) Yoscaba Series***AC-1150. Yoscaba 1**

Depth 1.30 m

420 ± 160 $\delta^{13}\text{C} = -22.1 \pm 0.2\text{‰}$ **AC-1151. Yoscaba**

Depth 1.20 m

380 ± 100 $\delta^{13}\text{C} = -21.9 \pm 0.2\text{‰}$

Charcoal samples from Santa Catalina (22°09'45''S, 66°01'55''W; 3670 m asl). Collected and submitted in 1986 by J L Balbuena.

Comment: These samples were taken from the riverbank of the Yoscaba River making no systematic excavation. The aim was to determine the length of the setting period.

*D) Cerro Colorado***AC-1085. Cerro Colorado**

Depth 0.20 m

430 ± 90

Charcoal sample from Cerro Colorado (22°12'S, 65°32'W; 3606 m asl). Collected and submitted in 1986 by P Krapovickas.

*E) Inca Cueva IV Site***AC-1112. Inca Cueva IV**

Depth 0.35 m

5200 ± 110 $\delta^{13}\text{C} = -18.0 \pm 0.2\text{‰}$

Wood, "queñoa", from Quebrada de Inca Cueva (23°00'S, 65°27'W; 3680 m asl). Collected and submitted in 1986 by C Aschero.

*F) Cueva de Cristobal Series***AC-1209. Cueva de Cristobal 1**

Depth 15 cm

2600 ± 120

AC-1210. Cueva de Cristobal 2	2860 ± 160
Depth 45 cm	$\delta^{13}\text{C} = -21 \pm 0.2\text{‰}$
AC-1211. Cueva de Cristobal 3	2530 ± 100
Depth 25 cm	
AC-1212. Cueva de Cristobal 4	2630 ± 140
Depth 25 cm	$\delta^{13}\text{C} = -21 \pm 0.2\text{‰}$

Charcoal samples from Cueva de Cristobal (23°17'S, 65°42'W; 3760 m asl), La Matadería, Humahuaca department. Collected and submitted in 1988 by J Fernández.

Comment: Samples are from sedimentation containing pedunculated and lanceolated projectile points, and corrugated pottery. Published in Fernández (1988–1989).

G) Peña Colorada Series

AC-1083. Peña Colorada 1	560 ± 90
Depth 0.40 m	$\delta^{13}\text{C} = -22.1 \pm 0.2\text{‰}$
AC-1084. Peña Colorada 2	Actual
Depth 0.40 m	

Charcoal samples from Peña Colorada (23°23'S, 65°18'W; 2700 m asl). Collected and submitted in 1986 by P Krapovickas.

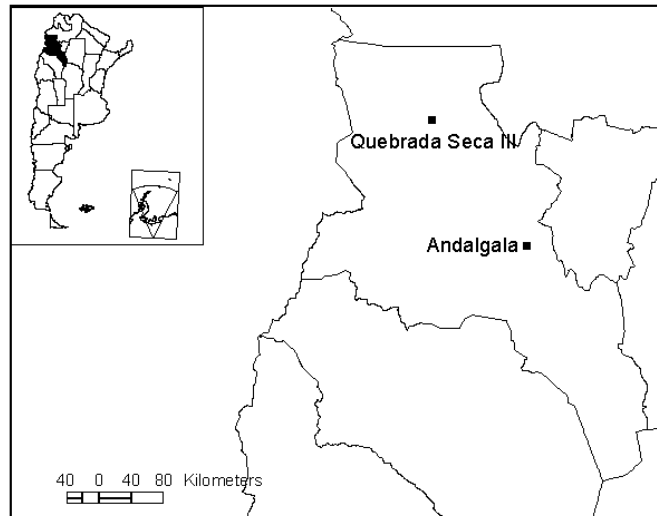


Figure 2 Catamarca sample sites

Catamarca

A) Quebrada Seca III Site Series

AC-1115. Quebrada Seca III, 1	4930 ± 110
Charcoal sample. Depth 0.34 m.	$\delta^{13}\text{C} = -24.8 \pm 0.2\text{‰}$

AC-1117. Quebrada Seca III, 2

Charcoal sample. Depth 0.68 m.

6065 ± 140

$\delta^{13}\text{C} = -24.8 \pm 0.2\text{‰}$

AC-1118. Quebrada Seca III, 3

Wood sample. Depth 1.20 m.

8670 ± 350

Samples from Antofagasta de la Sierra (26°05'S, 67°25'W; 4000 m asl). Collected and submitted in 1986 by C Aschero.

B) Andalgalá

AC-1130. Andalgalá

Depth 1.90 m

Actual

$\delta^{13}\text{C} = -22.8 \pm 0.2\text{‰}$

Charcoal sample from Andalgalá (27°30'50"S, 66°18'30"W; 1500 m asl). Collected and submitted in 1986 by Verónica Williams.

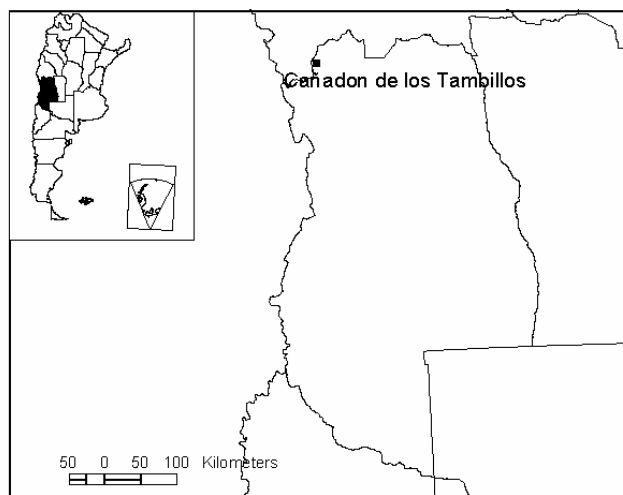


Figure 3 Mendoza sample site

Mendoza

Cañadón de los Tambillos

AC-1159. Cañadón de los Tambillos

Basal Wood from Cañadón de los Tambillos (32°21'S, 69°38'W; 4000 m asl). Collected and submitted in 1988 by J R Barcena.

Actual

Neuquén

Huemul Cave Series

AC-0010. Cueva Huemul

Depth 0.60 m

11,150 ± 230

$\delta^{13}\text{C} = -25 \pm 0.2\text{‰}$

Soil with charcoal from the floor of Huemul Cave (37°2'S, 69°50'W; 900 m asl), Buta Ranquil department. Collected and submitted by J Fernández.

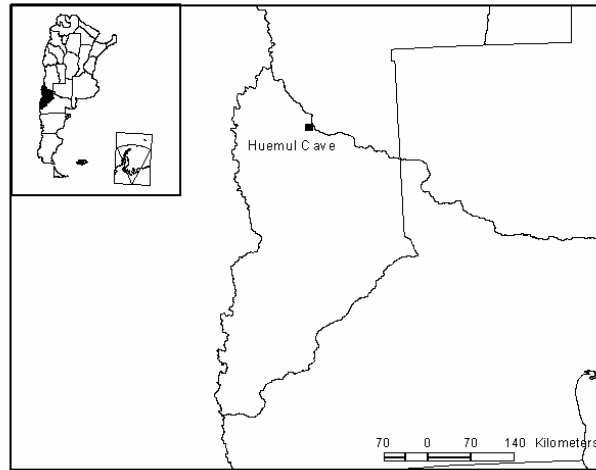


Figure 4 Neuquén sample site

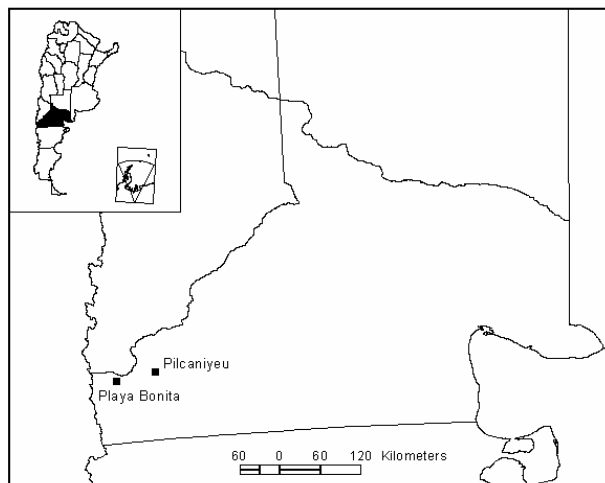


Figure 5 Río Negro sample sites

Río Negro

A) Pilcaniyeu Series

AC-1077. Pilcaniyeu 1	410 ± 100
Depth 0.36 m	
AC-1078. Pilcaniyeu 2	1010 ± 90
Depth 0.93 m	$\delta^{13}\text{C} = -26.5 \pm 0.2\text{‰}$
AC-1079. Pilcaniyeu 3	1380 ± 100
Depth 0.86 m	$\delta^{13}\text{C} = -23.2 \pm 0.2\text{‰}$
AC-1080. Pilcaniyeu 4	1200 ± 90
Depth 1.01 m	$\delta^{13}\text{C} = -23.2 \pm 0.2\text{‰}$

AC-1082. Pilcaniyeu 5

Depth 0.60 m

1480 ± 90

$\delta^{13}\text{C} = -23.2 \pm 0.2\text{‰}$

Charcoal samples from Pilcaniyeu (41°5'S, 70°43'W; 900 m asl). Collected and submitted in 1986 by M T Boschín.

B) Playa Bonita

AC-0009. Playa Bonita

Actual

$\delta^{13}\text{C} = -27 \pm 0.2\text{‰}$

Wood of monoxila canoe (called "huampu") made with an empty coihue (*Nothofagus dombeyii*) trunk found at the bottom of Nahuel Huapi lake, 15 m deep at Playa Bonita site (41°10'S, 71°25'W; 900 m asl). Collected and submitted in 1979 by J Fernández.

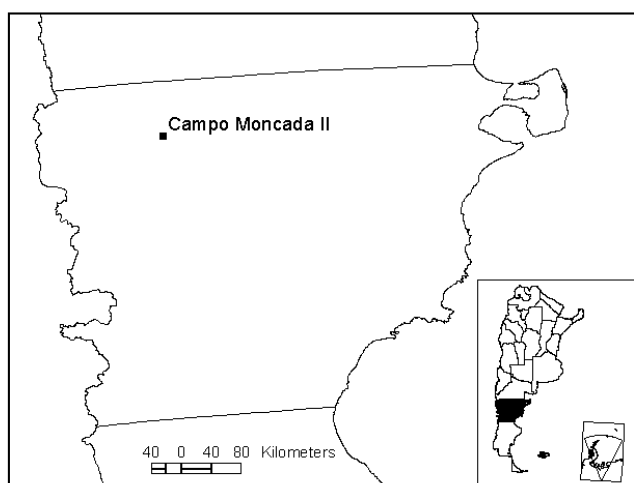


Figure 6 Chubut sample site

Chubut

Campo Moncada II Site

AC-1110. Campo Moncada II

Depth 0.42 m

4805 ± 115

$\delta^{13}\text{C} = -22.2 \pm 0.2\text{‰}$

Charcoal from Campo Moncada II site, Valle Piedra Parada (42°39'S, 70°06'W; 426 m asl). Collected and submitted in 1986 by C Aschero.

Santa Cruz

A) Estancia La Magdalena Series

AC-0943. Estancia La Magdalena 1

Wood sample

1380 ± 90

$\delta^{13}\text{C} = -22.1 \pm 0.2\text{‰}$

AC-1075. Estancia La Magdalena 2

Charcoal sample. Depth 0.93 m.

4860 ± 150

$\delta^{13}\text{C} = -21.2 \pm 0.2\text{‰}$

Samples from Estancia La Magdalena, Puesto El Rodeo (46°53'S, 70°27'W; 1400 m asl). Collected and submitted in 1986 by C Gradin.

Comment: These samples were used to date skeletons at Chenque inside the same stratigraphic sequence. It is believed that each skeleton represents a different culture level of the Río Pinturas area.

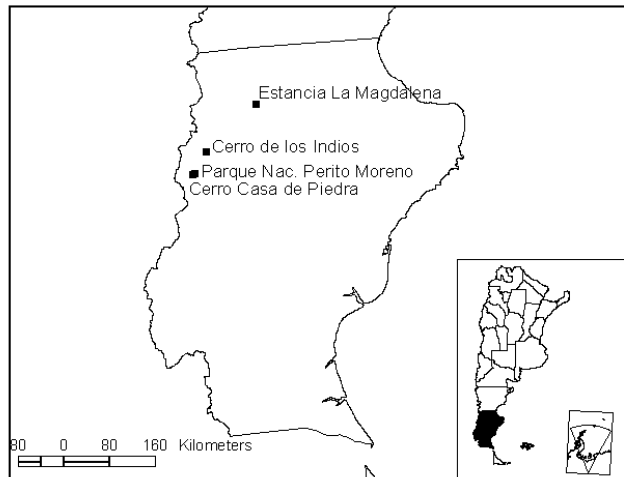


Figure 7 Santa Cruz sample sites

B) Cerro de los Indios Series

AC-1098. Cerro de los Indios 1 **3120 ± 80**
 Depth 1.44 m $\delta^{13}\text{C} = -23.4 \pm 0.2\text{‰}$

AC-1099. Cerro de los Indios 2 **970 ± 110**
 Depth 0.99 m $\delta^{13}\text{C} = -23.8 \pm 0.2\text{‰}$

Charcoal samples from Cerro de los Indios site (47°33'S, 71°42'W; 300 m asl), Río Chico department. Collected and submitted in 1986 by C Aschero.

C) Parque Nacional Perito Moreno

AC-1100. PNPM **1870 ± 110**
 Depth 0.70 m $\delta^{13}\text{C} = -24.2 \pm 0.2\text{‰}$

Charcoal sample from Parque Nacional Perito Moreno (47°52'S, 72°02'W; 900 m asl). Collected and submitted in 1986 by C Aschero.

D) Cerro Casa de Piedra Site Series

AC-1101. Cerro Casa de Piedra 1 **4735 ± 160**
 Wood sample. Depth 1.37 m. $\delta^{13}\text{C} = -23.4 \pm 0.2\text{‰}$

AC-1102. Cerro Casa de Piedra 2 **4930 ± 160**
 Charcoal sample. Depth 1.26 m. $\delta^{13}\text{C} = -24.8 \pm 0.2\text{‰}$

AC-1103. Cerro Casa de Piedra 3 **4330 ± 125**
 Charcoal sample. Depth 1.31 m. $\delta^{13}\text{C} = -23.9 \pm 0.2\text{‰}$

AC-1104. Cerro Casa de Piedra 4	2740 ± 100
Wood sample. Depth 6.77 m.	$\delta^{13}\text{C} = -28.7 \pm 0.2\text{‰}$
AC-1105. Cerro Casa de Piedra 5	4900 ± 95
Charcoal sample. Depth 1.29 m.	$\delta^{13}\text{C} = -24.8 \pm 0.2\text{‰}$
AC-1106. Cerro Casa de Piedra 6	4815 ± 170
Charcoal sample. Depth 1.37 m.	$\delta^{13}\text{C} = -24.1 \pm 0.2\text{‰}$
AC-1107. Cerro Casa de Piedra 7	2795 ± 95
Charcoal sample. Depth 1.25 m.	$\delta^{13}\text{C} = -23.7 \pm 0.2\text{‰}$

Wood and charcoal samples from Cerro Casa de Piedra site (47°53'S, 72°05'W; 900 m asl). Collected and submitted in 1986 by C Aschero.

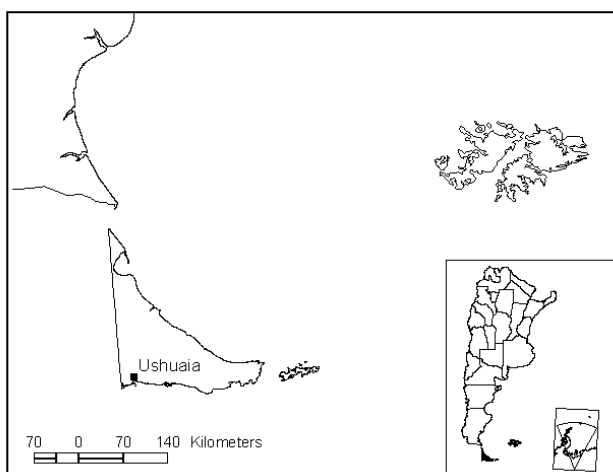


Figure 8 Tierra del Fuego sample site

Isla Grande de Tierra del Fuego, Antártida es Islas del Atlántico Sur

Ushuaia Series

AC-1164. Ushuaia 1	5600 ± 125
AC-1165. Ushuaia 2	45,410 ± 160

Shell samples from Ushuaia (54°45'S, 68°17'W; 8 m asl). Collected and submitted in 1987 by Ernesto Piana.

PALEOENVIRONMENTAL SAMPLES

San Juan

A) Caucete Series

AC-1143. Caucete 1	42.41 ± 0.96 pMC
Depth 0.80 m	$\delta^{13}\text{C} = -9.0 \pm 0.2\text{‰}$

AC-1144. Caucete 2 **39.31 ± 0.97 pMC**
 Depth 178 m $\delta^{13}\text{C} = -9.8 \pm 0.2\text{‰}$

AC-1145. Caucete 3 **53.70 ± 0.90 pMC**
 Depth 150 m $\delta^{13}\text{C} = -7.9 \pm 0.2\text{‰}$

Water samples from Caucete (31°41'S; 68°17'W). Collected and submitted in 1986 by INGEIS and CRAS.

B) Tulum Ullum Zonda Series

AC-1152. Tulum Ullum Zonda 1 **22.45 ± 0.86 pMC**
 Depth 2.47 m $\delta^{13}\text{C} = -6.3 \pm 0.2\text{‰}$

AC-1153. Tulum Ullum Zonda 2 **45.53 ± 0.97 pMC**
 Depth 150 m $\delta^{13}\text{C} = -7.7 \pm 0.2\text{‰}$

Precipitated carbonate, from water, Tulum Ullum Zonda, San Juan (31°28'S, 68°42'W). Collected and submitted in 1986 by INGEIS and CRAS.

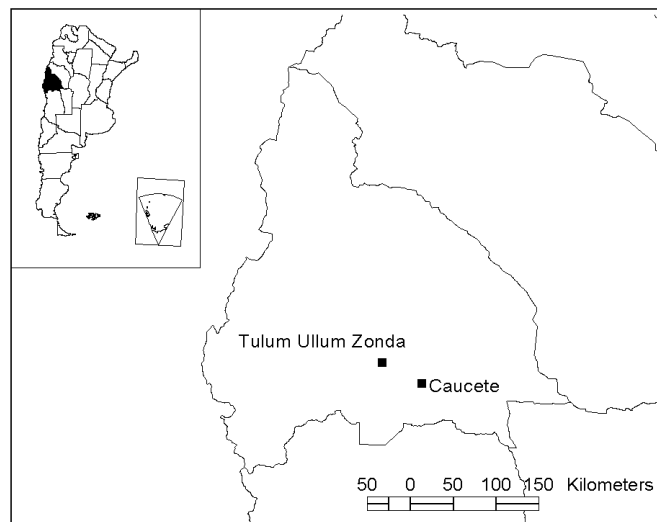


Figure 9 San Juan sample sites

San Luis

A) Salinas del Bebedero Series

AC-1180. Salinas del Bebedero 1 **12,355 ± 205**
 $\delta^{13}\text{C} = 1.5 \pm 0.2\text{‰}$

AC-1181. Salinas del Bebedero 2 **31,500 ± 1100**
 $\delta^{13}\text{C} = 1.3 \pm 0.2\text{‰}$

AC-1183. Salinas del Bebedero 3 **12,270 ± 240**
 $\delta^{13}\text{C} = -0.9 \pm 0.2\text{‰}$

Shell samples from Salinas del Bebedero (33°32'S, 66°39'W). Collected and submitted in 1988 by Miguel Gonzalez.

AC-1191. Laguna Carrilafquen **14,350 ± 180**

Lacustrine sediment from Laguna Carrilafquen Grande, Ing. Jacobacci (41°10'S, 69°15'W). Collected and submitted in 1988 by Miguel Gonzalez.

Comment: This sediment was formed during lacustrine stages of the Upper Pleistocene.

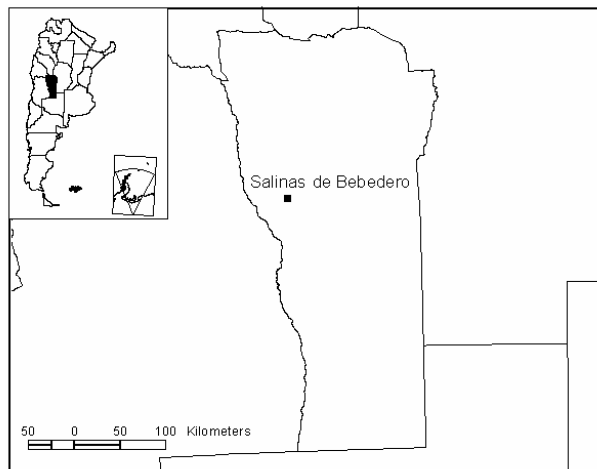


Figure 10 San Luis sample site

Buenos Aires

A) Ezeiza Series

AC-1157. Ezeiza 1 **4210 ± 105**

$\delta^{13}\text{C} = -1.0 \pm 0.2\text{‰}$

AC-1158. Ezeiza 2 **4060 ± 100**

$\delta^{13}\text{C} = -1.1 \pm 0.2\text{‰}$

AC-1160. Ezeiza 3 **4240 ± 170**

$\delta^{13}\text{C} = -1.2 \pm 0.2\text{‰}$

Shell samples from Ezeiza (34°51'S, 58°32'W). Collected and submitted in 1987 by Nilda Weiler.

B) Emplame Querandías

AC-1190. Empalme Querandías **8195 ± 105**

Paleosol from Tapalqué River, Empalme Querandies (37°S, 60°30'W) Olavarría. Collected and submitted in 1988 by Miguel Gonzalez.

Comment: This paleosol was formed on the floodplain during the Lower Holocene.

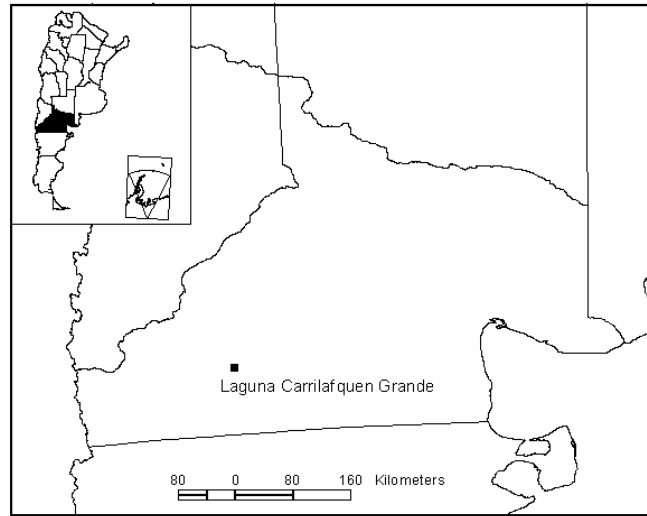


Figure 11 Río Negro sample site

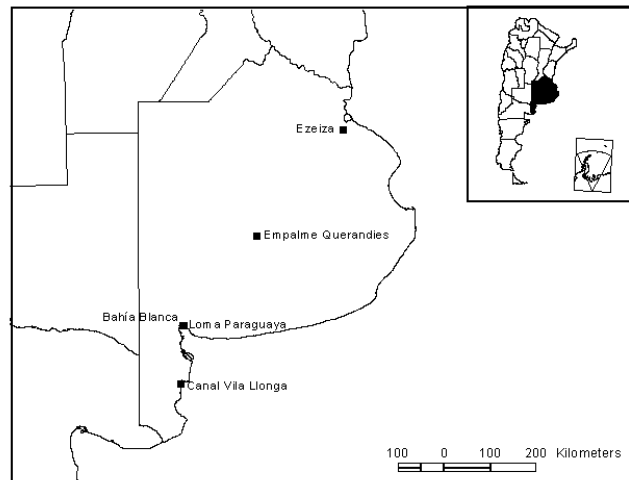


Figure 12 Buenos Aires sample sites

C) Loma Paraguaya

AC-1163. Loma Paraguaya

4615 ± 110

Depth 0.80 m Shell from Loma Paraguaya, Bahía Blanca (38°45'S, 62°17'W; 8 m asl). Collected and submitted in 1987 by Ester Farinati.

Comment: This sample was analyzed to help in the resolution of stratigraphic problems. See Farinati (1990).

D) Bahía Blanca Series

AC-1127. Bahía Blanca 1

40.48 ± 0.91 pMC
 $\delta^{13}\text{C} = -10.5 \pm 0.2\text{‰}$

Water sample from Frigorífico Bahienses's well (38°45'S, 62°15'W). Collected and submitted in 1986 by Miguel Albero and Bonorino.

Comment: These water sample correspond to the deep hydrothermal system of. Its dating were used in hydrogeological and paleoenvironmental studies.

AC-1128. Bahía Blanca 2 **30.46 ± 0.91 pMC**
 $\delta^{13}\text{C} = -11.8 \pm 0.2\text{‰}$

Water sample from Aguas Corrientes's well. Collected and submitted in 1986 by Miguel Albero and Guillermo Bonorino.

E) Canal Villa Longa Series

AC-1129. Canal Villa Longa 1 **6130 ± 120**
 $\delta^{13}\text{C} = -2.3 \pm 0.2\text{‰}$

AC-1202. Canal Villa Longa 2 **5630 ± 170**
 $\delta^{13}\text{C} = -2.5 \pm 0.2\text{‰}$

AC-1203. Canal Villa Longa 3 **31,900 ± 1100**
 $\delta^{13}\text{C} = -1.2 \pm 0.2\text{‰}$

AC-1204. Canal Villa Longa 4 **11,300 ± 18**

AC-1205. Canal Villa Longa 5 **4450 ± 80**

AC-1213. Canal Villa Longa 6 **23,798 ± 905**

AC-1214. Canal Villa Longa 7 **4347 ± 86**

AC-1216. Canal Villa Longa 8 **4350 ± 80**

AC-1217. Canal Villa Longa 9 **8660 ± 110**

AC-1220. Canal Villa Longa 10 **4507 ± 74**

AC-1221. Canal Villa Longa 11 **3871 ± 105**

AC-1222. Canal Villa Longa 12 **38,834 ± 2832**

AC-1223. Canal Villa Longa 13 **3764 ± 157**
 $\delta^{13}\text{C} = 2.2 \pm 0.2\text{‰}$

AC-1224. Canal Villa Longa 14 **3560 ± 90**
 $\delta^{13}\text{C} = 1.0 \pm 0.2\text{‰}$

Shell samples from Río Colorado (39°57'S, 62°20'W, 130 m asl). Collected and submitted in 1986 by Nilda Weiler.

Comment: The aim was to study the variations in sea level during the Late Pleistocene and Holocene in Bahía Anegada. Results published in Weiler (1993, 1996, 1998).

Isla Grande de Tierra del Fuego, Antártida es Islas del Atlántico Sur*Antártida Series*

AC-1155. Isla Ross 1	34,000 ± 1500
AC-1156. Isla Ross 2	35,900 ± 1900

Shell from James Ross Island (64°10'S, 57°45'W; 81 m asl). Collected and submitted in 1987 by Francisco Medina.

REPÚBLICA ORIENTAL DEL URUGUAY*Rocha Department Series*

AC-1194. Departamento Rocha 1	Actual
Depth -0.35 m	$\delta^{13}\text{C} = -25.6 \pm 0.2\text{‰}$
AC-1195. Departamento Rocha 2	190 ± 140
Depth -0.25 m	$\delta^{13}\text{C} = -23.9 \pm 0.2\text{‰}$
AC-1198. Departamento Rocha 3	1350 ± 160
Depth 0.30 m	$\delta^{13}\text{C} = -22.1 \pm 0.2\text{‰}$
AC-1199. Departamento Rocha 4	340 ± 115
Depth 1.90 m	$\delta^{13}\text{C} = -22.6 \pm 0.2\text{‰}$

Charcoal samples from Rocha Department (34°80'S, 54°12'W; 20 m asl), República Oriental del Uruguay. Collected and submitted in 1988 by R Bracco.

AC-1206. Departamento Rocha 5	5890 ± 110
AC-1207. Departamento Rocha 6	1000 ± 100

Shell samples from Rocha Department (37°50'S, 59°60'W; 20 m asl), República Oriental del Uruguay. Collected and submitted in 1988 by Miguel Gonzalez.

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