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INGEIS RADIOCARBON LABORATORY DATES IV

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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 ^{14}C dates in years before AD 1950. They are corrected for isotopic fractionation. ^{14}C 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 $\delta^{13}C = -21.4 \pm 0.2‰$

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 $\delta^{13}C = -25.0 \pm 0.2‰$

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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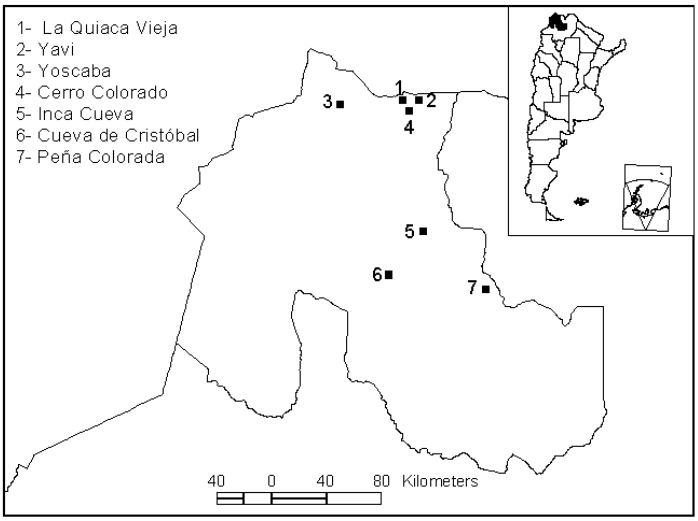

Figure 1 Jujuy sample sites

C) Yoscaba Series

AC-1150. Yoscaba 1 **420 ± 160**
Depth 1.30 m $\delta^{13}C = -22.1 \pm 0.2‰$

AC-1151. Yoscaba **380 ± 100**
Depth 1.20 m $\delta^{13}C = -21.9 \pm 0.2‰$

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 **430 ± 90**
Depth 0.20 m

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 **5200 ± 110**
Depth 0.35 m $\delta^{13}C = -18.0 \pm 0.2‰$

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 **2600 ± 120**
Depth 15 cm

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AC-1210. Cueva de Cristobal 2 **2860 ± 160**
Depth 45 cm $\delta^{13}C = -21 \pm 0.2‰$

AC-1211. Cueva de Cristobal 3 **2530 ± 100**
Depth 25 cm

AC-1212. Cueva de Cristobal 4 **2630 ± 140**
Depth 25 cm $\delta^{13}C = -21 \pm 0.2‰$

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 $\delta^{13}C = -22.1 \pm 0.2‰$

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.

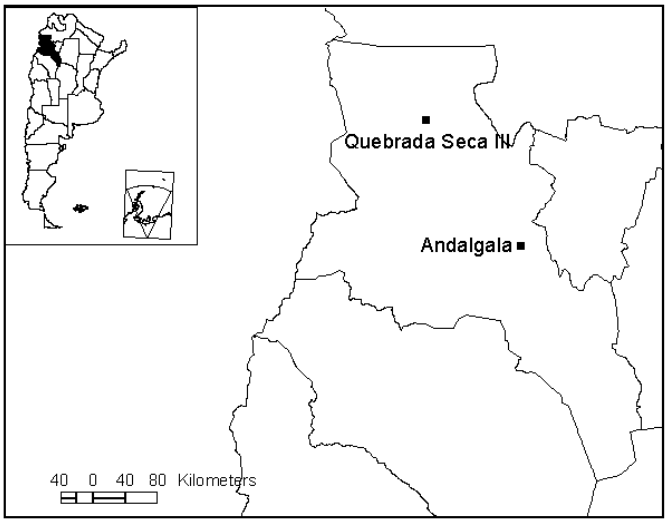

Figure 2 Catamarca sample sites

Catamarca

A) Quebrada Seca III Site Series

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

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AC-1117. Quebrada Seca III, 2 **6065 ± 140**
Charcoal sample. Depth 0.68 m. $\delta^{13}C = -24.8 \pm 0.2‰$

AC-1118. Quebrada Seca III, 3 **8670 ± 350**
Wood sample. Depth 1.20 m.

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 **Actual**
Depth 1.90 m $\delta^{13}C = -22.8 \pm 0.2‰$

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

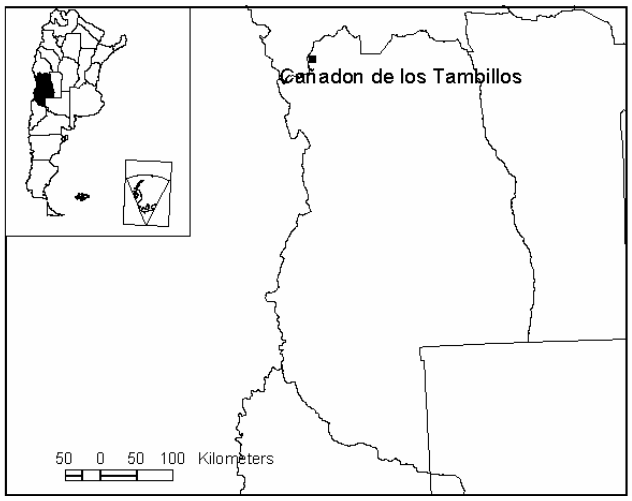

Figure 3 Mendoza sample site

Mendoza

Cañadón de los Tambillos

AC-1159. Cañadón de los Tambillos **Actual**
Basal Wood from Cañadón de los Tambillos (32º21′S, 69°38′W; 4000 m asl). Collected and submitted in 1988 by J R Barcena.

Neuquén

Huemul Cave Series

AC-0010. Cueva Huemul **11,150 ± 230**
Depth 0.60 m $\delta^{13}C = -25 \pm 0.2‰$

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.

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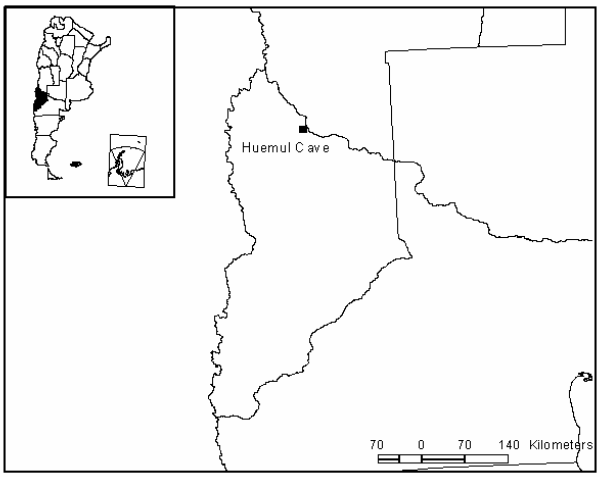

Figure 4 Neuquén sample site

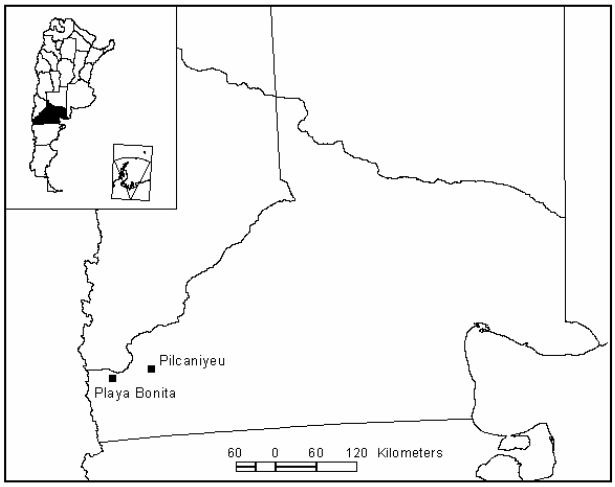

Figure 5 Río Negro sample sites

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 $\delta^{13}C = -26.5 \pm 0.2‰$

AC-1079. Pilcaniyeu 3 **1380 ± 100**
Depth 0.86 m $\delta^{13}C = -23.2 \pm 0.2‰$

AC-1080. Pilcaniyeu 4 **1200 ± 90**
Depth 1.01 m $\delta^{13}C = -23.2 \pm 0.2‰$

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AC-1082. Pilcaniyeu 5 **1480 ± 90**
Depth 0.60 m $\delta^{13}C = -23.2 \pm 0.2‰$

Charcoal samples from Pilcaniyeu (41°5′S, 70°43′W; 900 m asl). Collected and submitted in 1986 by M T Boschin.

B) Playa Bonita

AC-0009. Playa Bonita **Actual**
$\delta^{13}C = -27 \pm 0.2‰$

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.

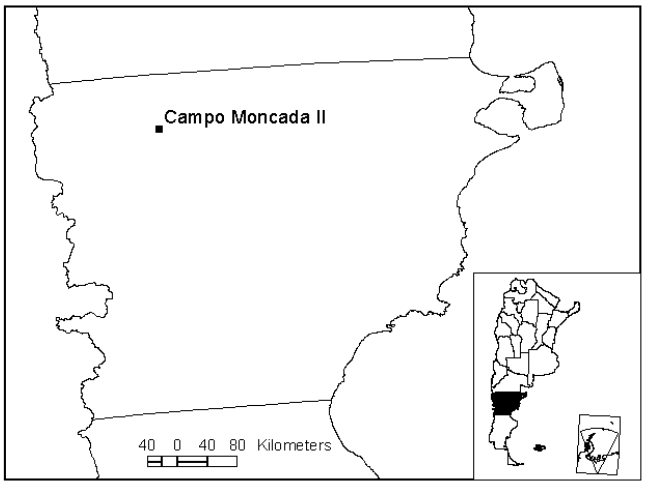

Figure 6 Chubut sample site

Chubut

Campo Moncada II Site

AC-1110. Campo Moncada II **4805 ± 115**
Depth 0.42 m $\delta^{13}C = -22.2 \pm 0.2‰$

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 **1380 ± 90**
Wood sample $\delta^{13}C = -22.1 \pm 0.2‰$

AC-1075. Estancia La Magdalena 2 **4860 ± 150**
Charcoal sample. Depth 0.93 m. $\delta^{13}C = -21.2 \pm 0.2‰$

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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.

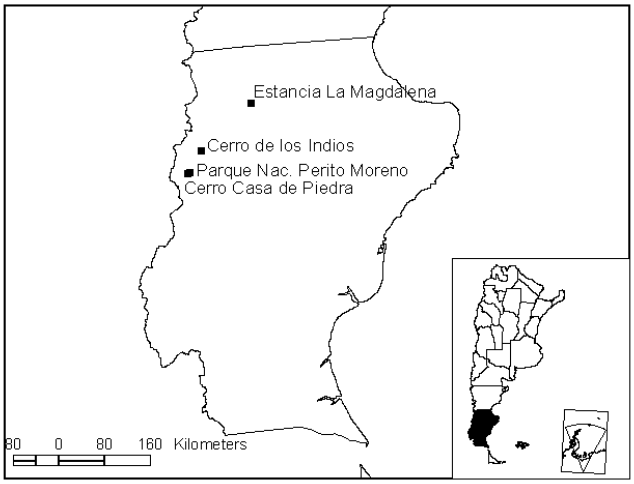

Figure 7 Santa Cruz sample sites

B) Cerro de los Indios Series

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

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

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 $\delta^{13}C = -24.2 \pm 0.2‰$

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. $\delta^{13}C = -23.4 \pm 0.2‰$

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

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

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AC-1104. Cerro Casa de Piedra 4 **2740 ± 100**
Wood sample. Depth 6.77 m. $\delta^{13}C = -28.7 \pm 0.2‰$

AC-1105. Cerro Casa de Piedra 5 **4900 ± 95**
Charcoal sample. Depth 1.29 m. $\delta^{13}C = -24.8 \pm 0.2‰$

AC-1106. Cerro Casa de Piedra 6 **4815 ± 170**
Charcoal sample. Depth 1.37 m. $\delta^{13}C = -24.1 \pm 0.2‰$

AC-1107. Cerro Casa de Piedra 7 **2795 ± 95**
Charcoal sample. Depth 1.25 m. $\delta^{13}C = -23.7 \pm 0.2‰$

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.

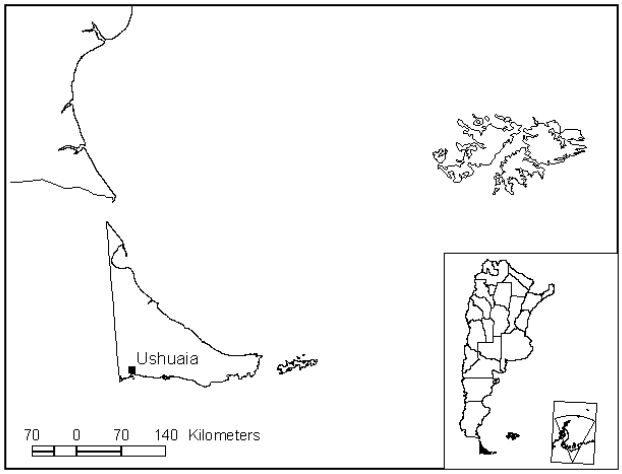

Figure 8 Tierra del Fuego sample site

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 $\delta^{13}C = -9.0 \pm 0.2‰$

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

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

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 $\delta^{13}C = -6.3 \pm 0.2‰$

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

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

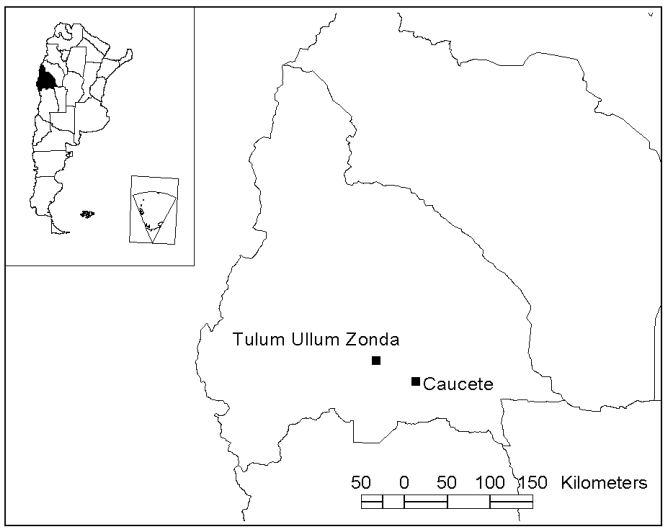

Figure 9 San Juan sample sites

San Luis

A) Salinas del Bebedero Series

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

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

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

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

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

Lacustrian 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 lacustrian stages of the Upper Pleistocene.

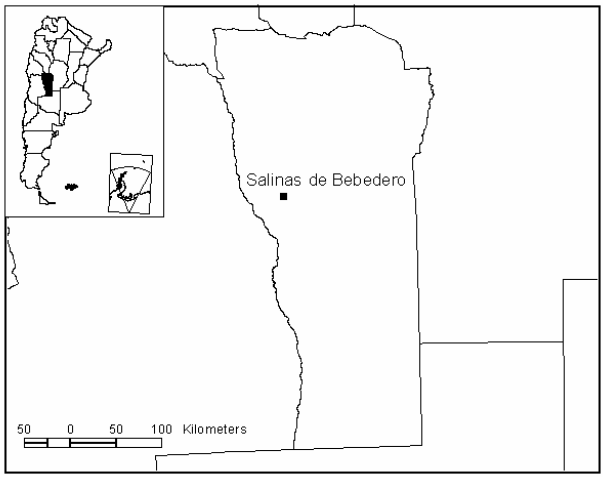

Figure 10 San Luis sample site

Buenos Aires

A) Ezeiza Series

AC-1157. Ezeiza 1 **4210 ± 105**
$\delta^{13}C = -1.0 \pm 0.2‰$

AC-1158. Ezeiza 2 **4060 ± 100**
$\delta^{13}C = -1.1 \pm 0.2‰$

AC-1160. Ezeiza 3 **4240 ± 170**
$\delta^{13}C = -1.2 \pm 0.2‰$

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

B) Emplame Querandíes

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

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

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

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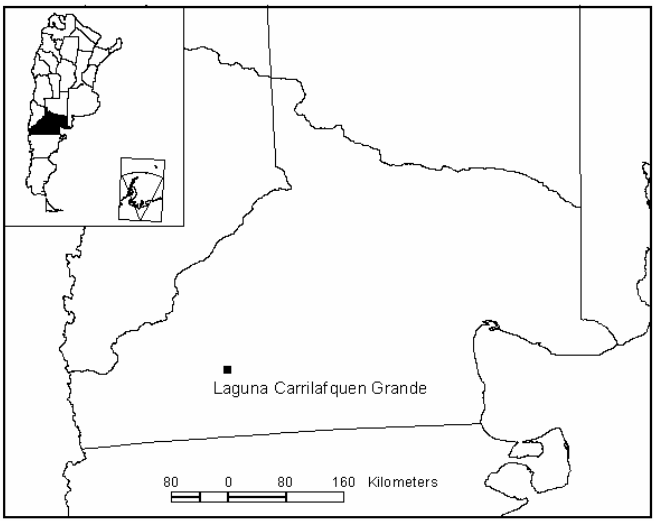

Figure 11 Río Negro sample site

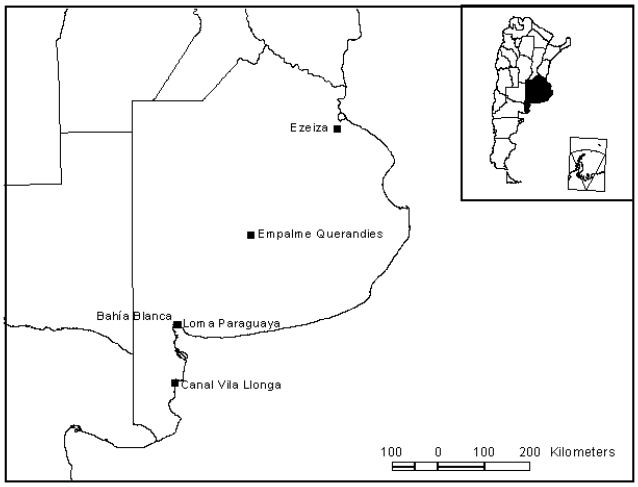

Figure 12 Buenos Aires sample sites

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**

$\delta^{13}C = -10.5 \pm 0.2‰$

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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**
$\delta^{13}C = -11.8 \pm 0.2‰$

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**
$\delta^{13}C = -2.3 \pm 0.2‰$

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

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

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**
$\delta^{13}C = 2.2 \pm 0.2‰$

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

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).

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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 $\delta^{13}C = -25.6 \pm 0.2‰$

AC-1195. Departamento Rocha 2 **190 ± 140**
Depth –0.25 m $\delta^{13}C = -23.9 \pm 0.2‰$

AC-1198. Departamento Rocha 3 **1350 ± 160**
Depth 0.30 m $\delta^{13}C = -22.1 \pm 0.2‰$

AC-1199. Departamento Rocha 4 **340 ± 115**
Depth 1.90 m $\delta^{13}C = -22.6 \pm 0.2‰$

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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REFERENCES

Albero MC, Angiolini F. 1985. INGEIS Radiocarbon Laboratory Dates II. *Radiocarbon* 27(2B): 314–37.

Balbuena JL. 1989. Cuadreno Nº 1. Facultad de Humanidades y Ciencias Sociales. Universidad de Nacional de Jujuy. p 49–67.

Bonorino AG. 1993. Actas del I Seminario Hispanoargentino sobre Temas Actuales de Hidrología Subterránea.

Gradin C, Aguerre A. 1994. Contribución a la arqueología del Río Pinturas (Provincia de Santa Cruz). p 252–72, 356.

Farinati E. 1990. *Marine Geology* 94:353–60.

Fernández J. 1988–1989. Ocupaciones alfareras (2.860 ± 160 años A. P.) en la Cueva de Cristóbal, Puna de Jujuy, Argentina. *Relaciones de la Sociedad Argentina de Antropología* 17(2):139–82.

Fernández J. 1978. Restos de embarcaciones primitivas en el Lago Nahuel Huapi. *Anales de Parques Nacionales* 14:45–77.

Weiler NE. 1993. Niveles marinos del Pleistoceno tardío y Holoceno, presentes en Bahía Anegada, provincia de Buenos Aires. Geocronología y Correlaciones. *Revista de la Asociación Geológica Argentina* 48(3–4): 207–16.

Weiler NE. 1996. Depósitos litorales del Pleistoceno tardío y Holoceno en el área de Balneario Los Pocitos, provincia de Buenos Aires. *Actas de la VI Reunión Argentina de Sedimentología*. *I Simposio de Arcillas*: 129–34.

Weiler NE. 1998. Holocene sea level in the Bahía Anegada, Argentine Republic. *Journal of Coastal Research* 14(4):1034–43.