

Activities of the Salinity Science Working Group

- Report of the US CLIVAR Salinity Science Working Group, 45pp, published July 5, 2007

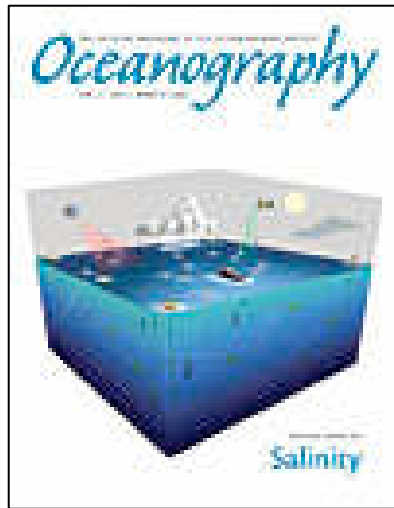
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- *Ocean Salinity in Climate and Ocean Dynamics*, Special Session of Ocean Sciences Meeting, (Lagerloef and Schmitt), March 2008
- Special issue of *Oceanography Magazine*, March 2008
- Salinity SWG Meeting, Woods Hole, July 2008 (last week)
 - {NASA ROSES2008 Salinity call for proposals due Oct., 2008}
- *Aquarius/SAC-D Salinity Workshop*: Puerto Madryn, Chubut, Argentina from 3 to 6 Dec. 2008
- Proposed special joint session of the Fall AGU, “Climatic Variability in the Marine Freshwater Cycle”, Dec. 2008

Ocean Salinity in Climate and Ocean Dynamics (Ocean Sciences)

22 Presentations

- LAGERLOEF, G S; LILLY, J; GUNN, J T;** ESTIMATING THE ROLE OF SALT DIVERGENCE TERMS IN THE MARINE FRESHWATER BUDGET USING ARGO DATA AS PRECURSOR TO AQUARIUS/SAC-D SATELLITE SALINITY DATA
Yeager, S G; Large, W G; OBSERVED DIAPYCNAL INJECTION OF SALINITY ANOMALIES
- NOF, D;** INCREASED FRESH WATER FLUX AND THE SLOWING OF THE MOC-- WILL IT WARM OR COOL EUROPE?
- YU, L; SCHMITT, R;** SALINITY AND THE OCEAN WATER CYCLE
- REN, L; RISER, S C;** DECADEAL SCALE SALT BUDGET EVALUATION 1993-2006
- CRAVATTE, S; DELCROIX, T; MCPHADEN, M J; ZHANG, D;** SURFACE FRESHENING OF THE TROPICAL PACIFIC WARM POOL SINCE THE 1950S.
- BUSALACCHI, A J; HACKERT, E C; BALLABRERA-POY, J; ZHANG, R H; MUTUGUDDE, R;** ROLE OF SALINITY ASSIMILATION IN A HYBRID COUPLED MODEL FOR THE TROPICAL PACIFIC
- FOLTZ, G R; MCPHADEN, M J;** IMPACT OF BARRIER LAYER THICKNESS ON TROPICAL NORTH ATLANTIC SST
- RISER, S C; LAGERLOEF, G;** HIGH-RESOLUTION SURFACE SALINITY AND TEMPERATURE MEASUREMENTS FROM ARGO FLOATS
- KIM, S B; WENTZ, F J;** SIMULATION OF SALINITY RETRIEVAL OVER OPEN OCEANS BY THE SPACEBORNE AQUARIUS INSTRUMENT
- HEFFNER, D M; SUBRAHMANYAM, B;** INDIAN OCEAN ROSSBY WAVES EXAMINED USING HYCOM SIMULATIONS AND MULTIPLE SATELLITE SENSORS
- BINGHAM, F M;** SEASONAL CYCLES OF MIXED LAYER SALINITY IN THE NORTH PACIFIC FROM ARGO DATA
- HACKERT, E C; BUSALACCHI, A J; BALLABRERA-POY, J; ZHANG, R H; MURTUGUDDE, R;** SALINITY BIASES IN LEVEL AND LAYER DATA ASSIMILATION RESULTS FOR THE TROPICAL PACIFIC
- BULUSU, S; MURTY, V S;** INTERANNUAL VARIABILITY OF SEA SURFACE SALINITY FROM ARGO PROFILES AND HYCOM SIMULATIONS IN THE TROPICAL INDIAN OCEAN
- ZHANG, R H; BUSALACCHI, A J;** IMPACTS OF FRESHWATER FLUX FORCING ON SALINITY AND INTERANNUAL VARIABILITY IN A HYBRID COUPLED MODEL OF THE TROPICAL PACIFIC
- LARSON, N G; JANZEN, C D; MURPHY, D J;** AN INSTRUMENT FOR EXTENDING ARGO TEMPERATURE AND SALINITY MEASUREMENTS THROUGH THE SEA SURFACE
- HOSODA, S; SUGA, T; SHIKAMA, N; MIZUNO, K;** GLOBAL SURFACE SALINITY CHANGE DETECTED BY ARGO FLOATS
- WANG/YUE, W Y; WU/DEXING, W D;** THE LONG-TERM VARIATION OF SALINITY IN THE BOHAI SEA
- FUJII, Y; MATSUMOTO, S; NAKANO, T; YASUDA, T; KAMACHI, M;** SALINITY VARIABILITY IN THE TROPICAL AND SUBTROPICAL PACIFIC IN THE MRI MULTIVARIATE OCEAN VARIATIONAL ESTIMATION (MOVE) SYSTEM
- GOURRION, J; CHAPRON, B; REUL, N;** VALIDATION STRATEGY FOR JOINT SSS/SST OBSERVATIONS IN THE CONTEXT OF SALINITY MONITORING FROM SPACE
- WHITEFIELD, J D; JOHNSON, R J; KNAP, A H;** DEEP WATER VARIABILITY AT THE BERMUDA TIME-SERIES SITES
- JACOB, S D; LE VINE, D M; LAGERLOEF, G S;** SEA SURFACE SALINITY AND TRANSPORT VARIABILITY TO SURFACE FORCING CHANGES
- UEKI, I; ANDO, K;** SALINITY VARIATION OBSERVED WITH TRITON ARRAY



Special Issue on *Salinity*

Vol. 21, No. 1, March 2008

R.W. Schmitt: Salinity and the Global Water Cycle

A.L. Gordon and C.F. Giulivi: Sea Surface Salinity Trends over Fifty Years Within the Subtropical North Atlantic

Yashayaev and A. Clarke: Evolution of North Atlantic Water Masses Inferred from Labrador Sea Salinity Series

R. Lukas and F. Santiago-Mandujano: Interannual to Interdecadal Salinity Variations Observed Near Hawaii: Local and Remote Forcing by Surface Freshwater Fluxes

S.C. Riser, L. Ren, and A. Wong: Salinity in Argo: A Modern View of a Changing Ocean

G. Lagerloef, F.R. Colomb, D. Le Vine, F. Wentz, S. Yueh, C. Ruf, J. Lilly, J. Gunn, Y. Chao, A. deCharon, G. Feldman, and C. Swift: The Aquarius/SAC-D Mission: Designed to Meet the Salinity Remote-Sensing Challenge

CLIVAR Salinity Working Group: What's Next for Salinity?

Aquarius

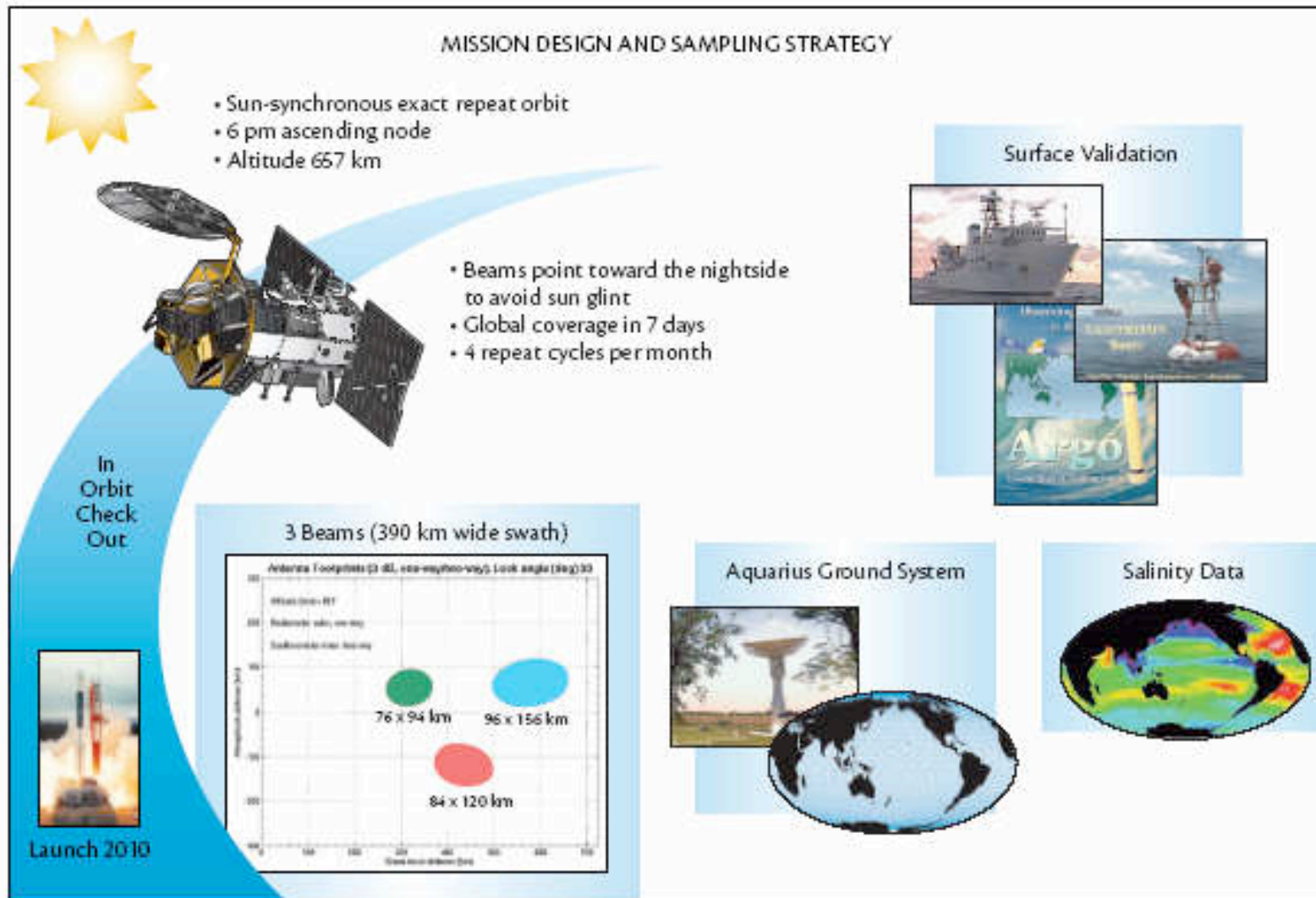


Figure 2. The Aquarius/SAC-D mission concept. The satellite will be in a polar sun-synchronous orbit crossing the equator at 6 p.m. (ascending) and 6 a.m. (descending) local time. The Aquarius sensor views continually away from the sun to avoid signal contamination from solar L-band energy flux. The three beams vary in width and incidence angle to form a 390-km-wide ground swath. The orbit has an exact repeat ground track every seven days, with 390-km track spacing at the equator, ensuring complete global coverage of the swath. Salinity data calibration and validation will be based on available in situ surface measurements by ships, buoys, and Argo floats.

Expected improvement in SSS coverage based on Aquarius

Aquarius expected
coverage →

Climatology →

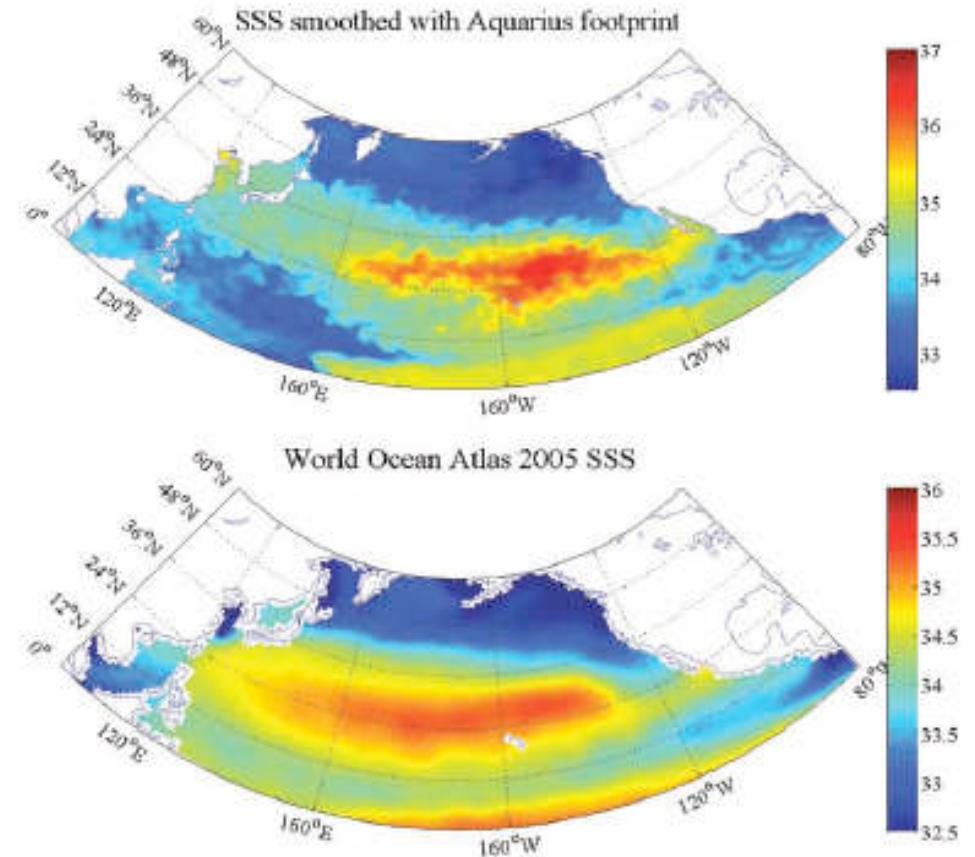


Figure 3. Illustration of the basin-scale spatial resolution provided by the Aquarius footprint dimensions. Top: Snapshot of a 1/8-degree Ocean General Circulation Model sea surface salinity (SSS) field. Middle: The same field with a 150-km Gaussian filter applied to simulate the Aquarius spatial resolution, removing much of the eddy-scale structure while preserving good spatial resolution of basin- and gyre-scale structures. Bottom: Mean annual SSS from World Ocean Atlas 2005.

Salinity SWG Meeting Agenda

WHOI July 9 -10, 2008

Host: Ray Schmitt

Wed July 9

9:00 AM Introduction

Meeting goals (Schmitt)

Aquarius perspective (Lagerloef)

NASA perspective (Lindstrom)

Global Evaporation Trends and Diurnal Salinity Cycles (Yu)

1:00PM Defining a Process study

Tools: Foul resistant salinity sensors for drifters (Schmitt). Surface CTD profiling from floats (Riser), Use of gliders for budget studies (Fratantoni), models and assimilation (Large, Carton)

Thurs July 10

9:00 AM Discussion of a Process study

Advantages/disadvantages of high rainfall vs low rainfall regions

Logistical advantages of the tropical/subtropical Atlantic

1:00 PM The way forward:

Incorporating other scientists

Writing tasks, future meetings etc.

Potential location for a process study

Characteristics of location:

- >Low $\nabla \cdot (\vec{U}S)$
- >Low precip
- >Source for northern tropical thermocline
- >Some previous information about the oceanography

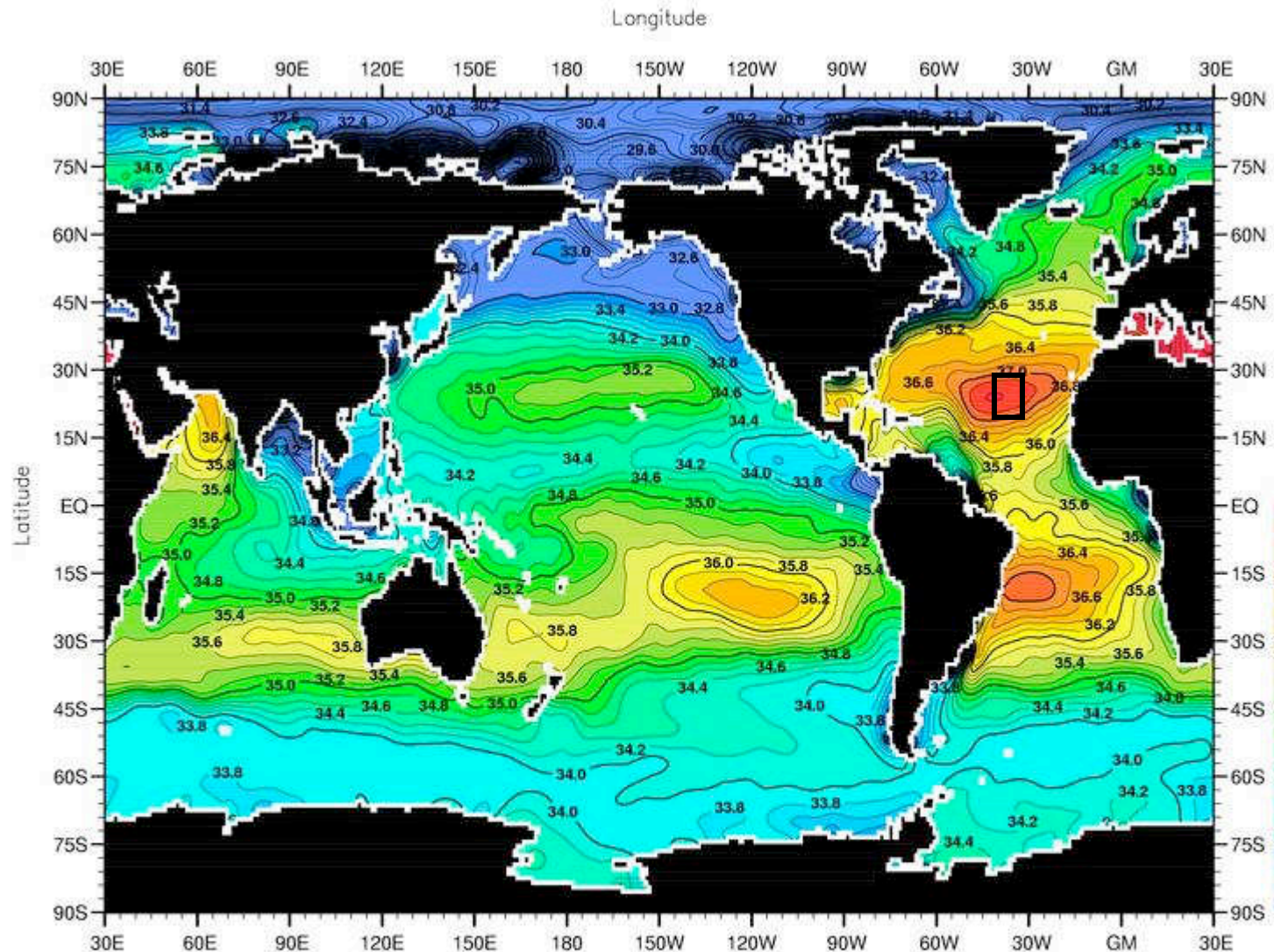


Fig. A2-1. Annual mean salinity (PSS) at the surface.

Minimum Value= 2.37

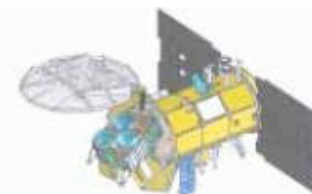
Maximum Value= 40.37

Contour Interval: 0.20

"Climatic Variability in the Marine Freshwater Cycle"

Proposed Fall AGU meeting 2008 Special Session
(Lagerloef and Hou)

- Changes in the global water cycle are key elements of climate change, and are more difficult to both measure and forecast than is global temperature. This session will address the problems and progress in understanding climatic variations in the marine freshwater cycle both in the ocean and atmosphere, and possible links to changes in the cryosphere. Topics of interest include (a) observed trends and variability in ocean salinity, rainfall and evaporation as seen in conventional and satellite observational records and GCM re-analyses, (b) uncertainties in the net air-sea water flux budget and how they can be resolved, (c) the roles of circulation in both the ocean and atmosphere, (d) relationship to variations in the cryosphere and sea level, and other related topics.



4th Aquarius/SAC-D Science Workshop
in honor of Dr. F. Raul Colomb
03-05 December 2008
Puerto Madryn, Chubut, Argentina

Theme: Science Data, Research and Applications

- **Summary:** The Aquarius/SAC-D satellite mission will convene the 4th Science workshop 3- 5 December 2008, Puerto Madryn, Argentina. The mission, scheduled for launch in May 2010, involves international contributions by Argentina, the United States, Italy, Canada, France and Brazil. Aquarius/SAC-D constitutes a true observatory: It will provide measurements of ocean salinity, ocean winds, rain, sea ice, sea surface temperatures, soil moisture, high temperatures events (fires and volcanic activities), nighttime light sources, atmospheric temperature/humidity soundings, space environment and autonomous data relay from remote ground stations. Descriptions of the mission and ensemble of microwave, visible, infrared and other sensors are available at <http://www.conae.gov.ar/satellites/sac-d.html> and <http://aquarius.gsfc.nasa.gov>. This conference is intended to acquaint interested researchers and data users with the design and capabilities of the various sensors in conjunction with the Announcement of Opportunity to strengthen the international science team of Aquarius/SAC-D Observatory. Sessions will address calibration and validation, and explore a range of scientific studies and practical applications, such as the global hydrological cycle, ocean circulation, climate variability, oceanic CO2 flux, land processes, land use, soil moisture, natural hazards, cryosphere, operational forecasting, among many others.
- A second announcement within the next few months will provide call for abstracts. Specific registration, venue, lodging, agenda and other useful information will be provided in: http://www.conae.gov.ar/AQ_SAC-D_4thScienceWS/indexe.html
- A final note: This conference will be held in honor of Dr. F. Raul Colomb, the Principal Investigator for the CONAE SAC-C and SAC-D Mission. Raul passed away on 4 May 2008.

