



Agenda Item 3: Implementation of Air Traffic Flow Management (ATFM)

Reduction and harmonization of the Longitudinal Separation Minima in the SAM FIR's boundaries

(Presented by IATA)

SUMMARY	
This working paper presents a proposal for reduction and harmonization of the Longitudinal Separation Minima in the SAM FIR's boundaries, using the current ATC systems and infrastructure.	
REFERENCES:	
- SAM/IG Meetings	
ICAO strategic objectives:	<i>A - Safety</i> <i>B - Air navigation capacity and efficiency</i> <i>E - Environmental protection</i>

1. Background

1.1 SAM/IG/15 meeting (November 2014) recalled that the ATS/01 Multilateral meeting held in Bolivia in February 2014 and the SAM/IG/13 meeting (April 2014) had decided to include a text on flow control measures that had a domino effect and reduced operational efficiency and capacity in adjacent FIRs, mostly affecting small FIRs that did not have sufficient airspace to absorb measures unrelated to the flow control management philosophy.

1.2 SAM/IG/14 meeting indicated that the increase in demand expected for SAM Region can cause a domino effect, affecting many States and could cause delays and consequential losses to the users and, in addition, a work overload in the ATC units, in the absence of sufficient management units for the capacity and demand balancing.

2. Discussion

2.1 One way to achieve greater operational efficiency is through the reduction of longitudinal separation, mainly in the FIR boundaries, in order to ensure better air traffic flow. The abrupt increase in separation, usually from a radar separation to a conventional separation of 10 minutes and/or 80 NM, on the FIR boundaries, which is typically adopted in the Letters of Operational Agreement, cause operational problems for users and ATCO. Preliminary information on the increases of longitudinal separation in some portions of the SAM Region is presented in the **Appendix A** attached to this working paper. This information needs to be verified by experts from SAM States.

2.2 In the first phase, the application of 20 NM longitudinal separation with the use of GNSS (item 5.4.2.3.3.1 of Doc. 4444), would represent a gain of 60 NM in longitudinal separation, allowing the application of the optimum flight levels available.

2.3 In a second phase, it is recommended the application of radar separation, whose requirements are described below.

2.4 Application of radar separation within the limits of FIRs depends on four main aspects:

- a) Radar Coverage.
- b) Radar coverage Overlap.
- c) Ability to transfer and maintain radar identification of the aircraft.
- d) Direct VHF Communication.

2.5 Regarding the radar coverage and the corresponding overlap, it is observed that there is a sufficient surveillance infrastructure in significant portions of the South American airspace. The Surveillance Infrastructure can be observed in **Appendix B** to this working paper.

2.6 The transfer and maintenance of aircraft identification must be made in accordance with paragraph 8.6.3 of Doc. 4444. While one of the mechanisms of transfer is the application of automated systems, there are 7 other applicable methods, and some of them can be used immediately, without need for new equipment or systems. These methods of immediate application would be:

- a) Notification of the aircraft's discrete SSR code or aircraft address.
- b) Designation of the position indication by reference to, or in terms of bearing and distance from, a geographical position or navigational facility accurately indicated on both situation displays, together with the track of the observed position indication if the route of the aircraft is not known to both controllers.
- c) Where applicable, issuance of an instruction to the aircraft by the transferring controller to change SSR code and the observation of the change by the accepting controller.
- d) Issuance of an instruction to the aircraft by the transferring controller to squawk/transmit IDENT and observation of this response by the accepting controller.

2.7 In summary, the reduction of longitudinal separation, either in a conventional or radar operational environment, is expected to increase efficiency of operations in the SAM Region. The final goal, for radar environments, based on the coverage and corresponding overlap, is the application of radar separation in the FIR's boundaries. The application of some methods of transfer and maintenance of radar identification available in Doc. 4444 would allow the reduction of the longitudinal separation minimum in some FIR's boundaries.

2.8 Taking into consideration that the reduction of longitudinal separation from 10 minutes or 80 NM directly to a separation of 20 NM in a conventional environment could represent a significant impact on the operational procedures currently applied, it would be recommended to apply a gradual reduction, through an action plan developed by the SAMIG and the States involved, as, for example, 40 NM.

2.9 **Appendix C** presents a draft Action Plan to be considered by the meeting, in order to progress in the reduction and harmonization of longitudinal separation on the South American FIR's boundaries.

3. **Suggested actions:**

3.1 The Meeting is invited to:

- a) take note of the information provided in this working paper;
- b) analyze and update the information provided in the Appendix A;
- c) Develop an Action Plan, using the draft presented in the Appendix C, to implement the reduction of the longitudinal separation, including the necessary changes on the corresponding letter of agreements.

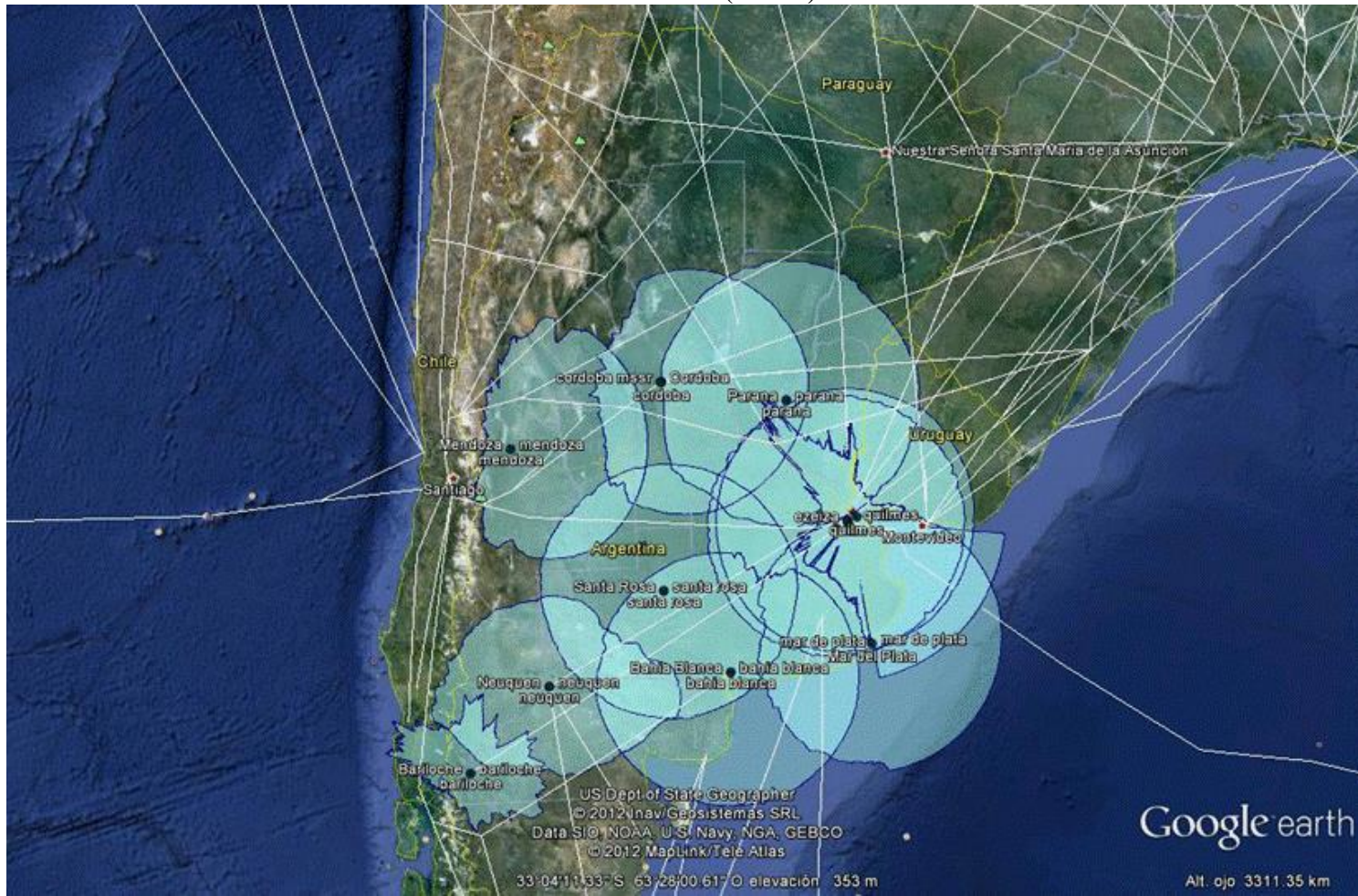
APPENDIX A - APÉNDICE A



APPENDIX B – APÉNDICE B

SAM RADAR COVERAGE DIAGRAMS – DIAGRAMAS DE COBERTURA DE RADAR SAM

ARGENTINA (FL250)



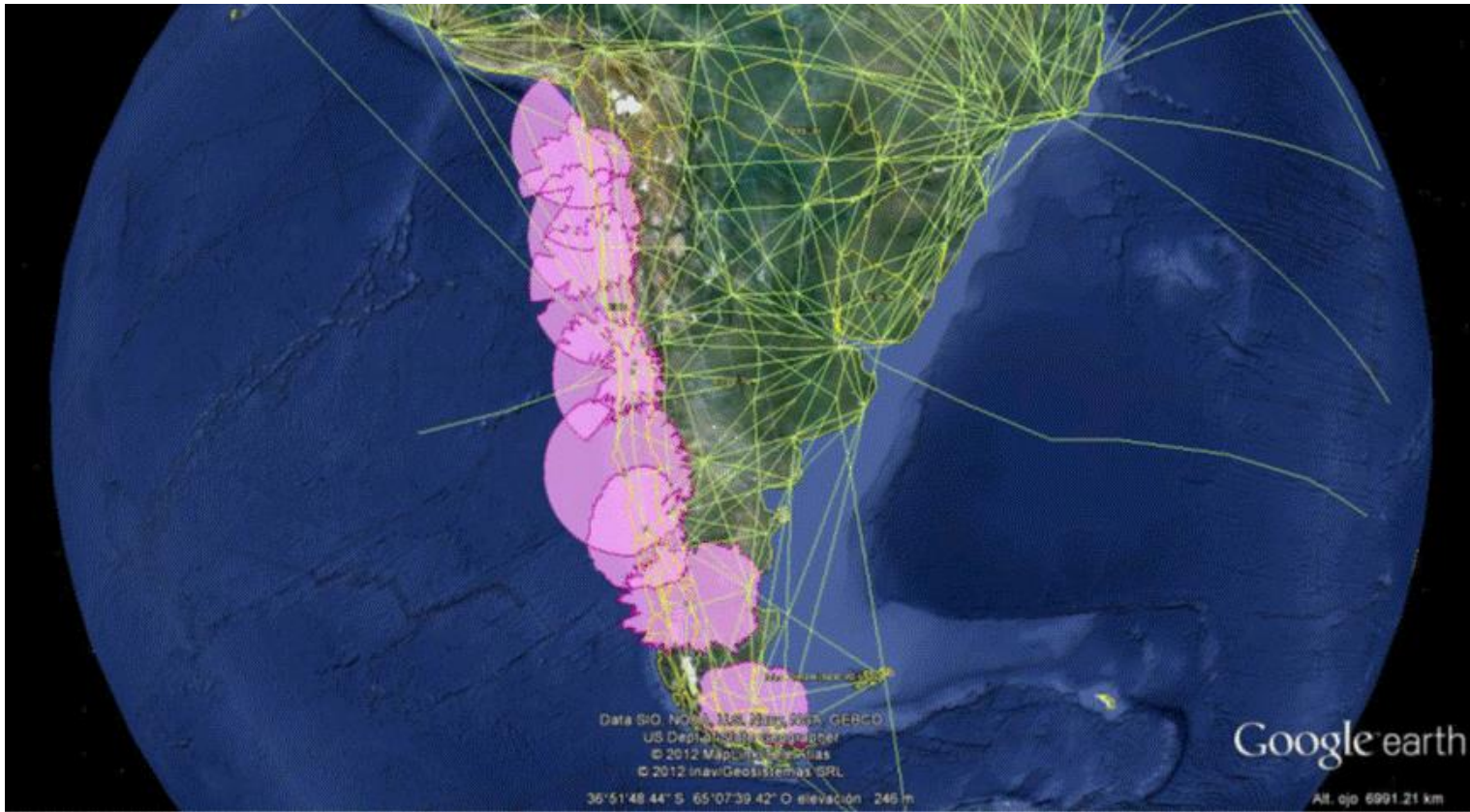
BRAZIL (FL200)



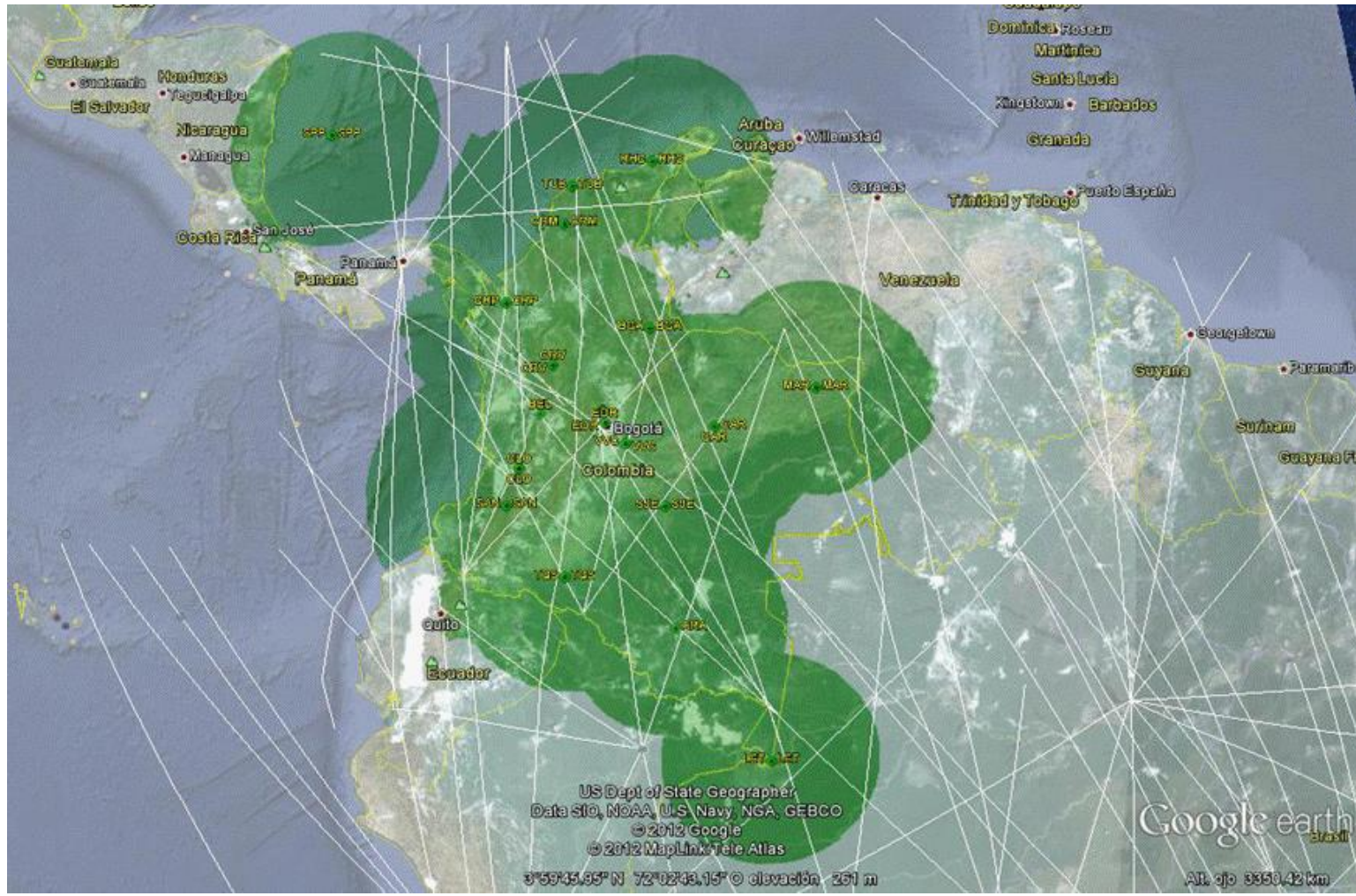
BOLIVIA (FL250)



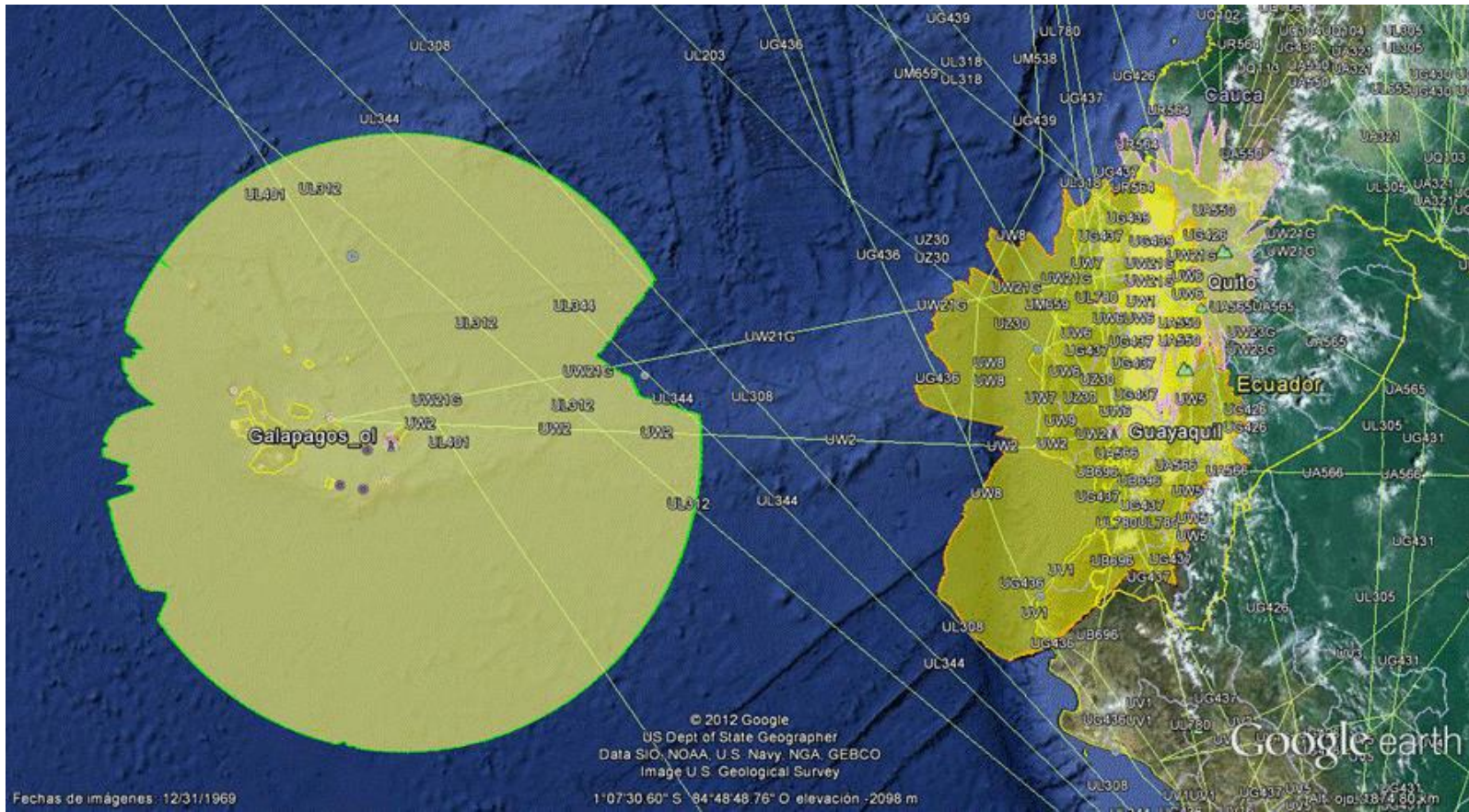
CHILE (FL250)



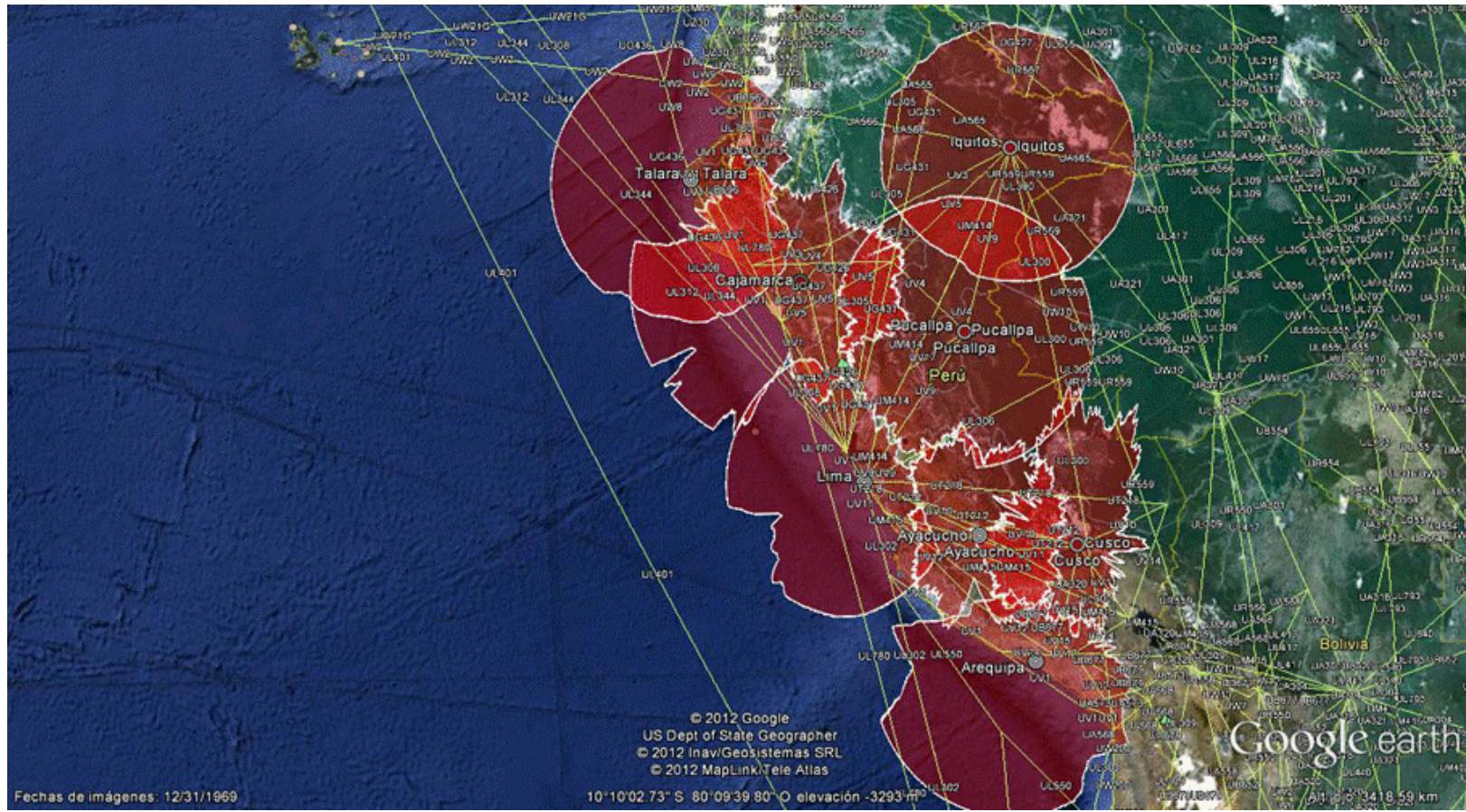
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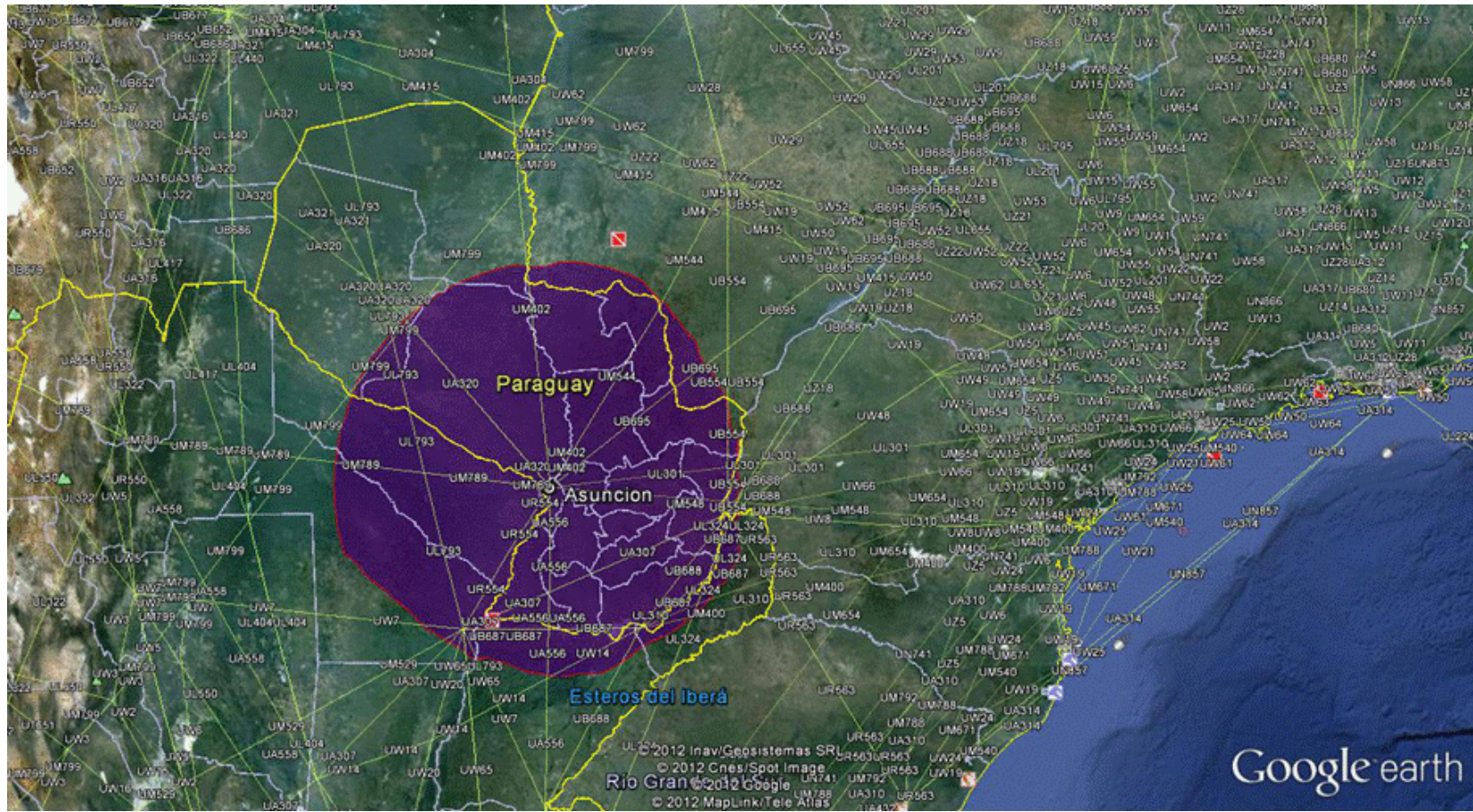
ECUADOR (FL250)



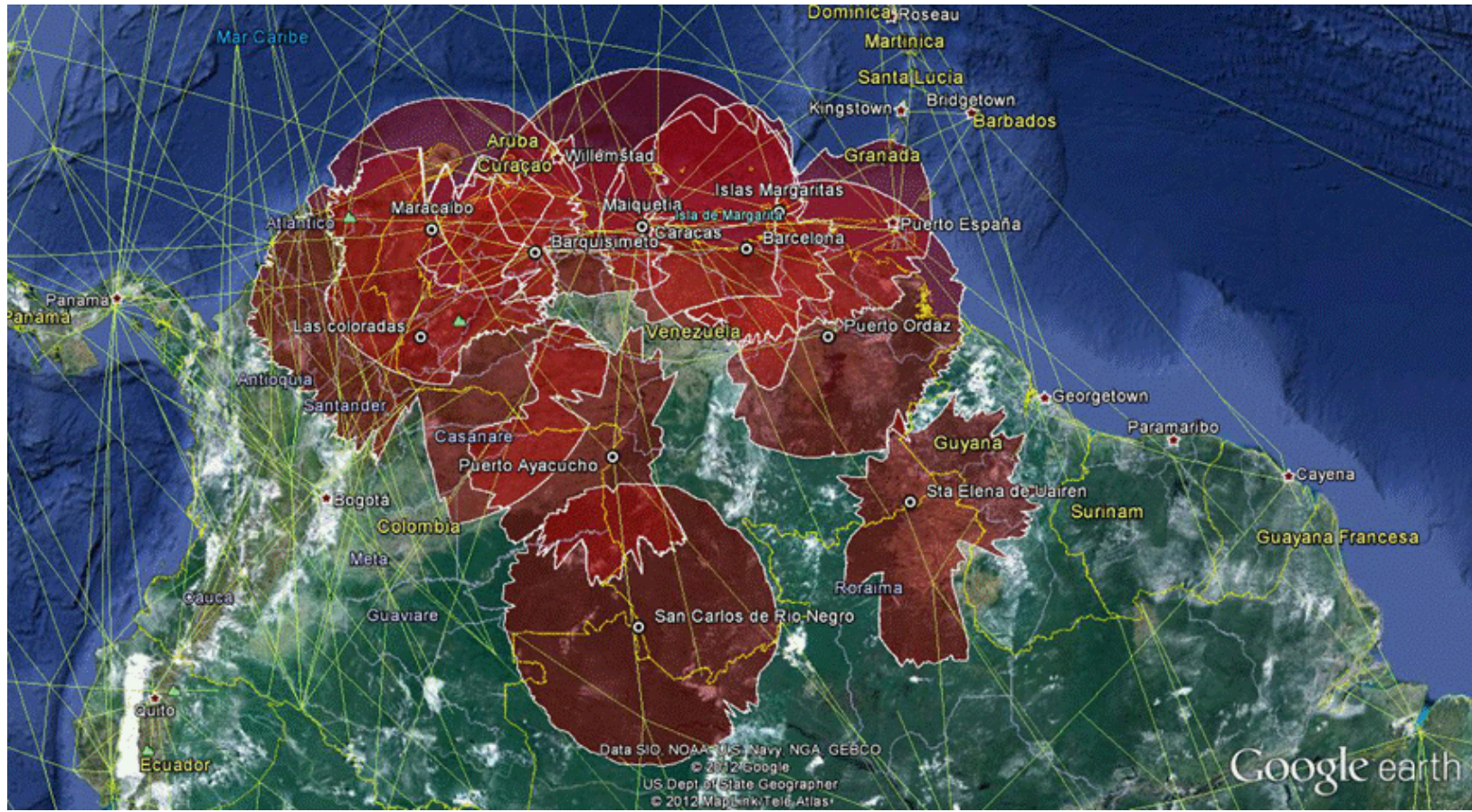
PERU (FL250)



PARAGUAY (FL250)



VENEZUELA (FL250)



TOTAL SAM REGION



APPENDIX C**ACTION PLAN****IMPROVEMENT AND HARMONIZATION OF THE LONGITUDINAL SEPARATIONS ACROSS THE FIRs (CONTINENTAL)**

- a. **Phase 1:** To change the separation methodology used by the ATC in the Region without the implementation of any CNS system.
 - i. Gap analysis: no ATM or CNS requirement at this point. Confirm the VHF communication coverage across the FIRs boundaries.
 - ii. Action required:
 - change, gradually, from procedural longitudinal separation based on time (10 minutes) or distance (80NM), commonly used on the Region when crossing FIRs) to 20 NM, applying GNSS.
 - Modify/update the Letter of Operational Agreements.
 - iii. Improvement: apply procedural longitudinal separation minima based on distance, using distance measuring equipment (DME) and/or GNSS (20NM) – same Mach number.
 - 1. Requirements: currently available = Direct VHF Comm pilot/ATC and GNSS and/or DME.
 - 2. Gain: 60NM improvement = FL availability.
- b. **Phase 2:** To change the separation standard from procedural to radar (continental).
 - i. Gap analysis: CNS analysis to confirm the radar overlap coverage.
 - ii. Action required: Modify/update the Letter of Operational Agreements for flights transferring between FIRs with similar surveillance capabilities/coverage.
 - iii. Improvement: apply radar transference (10NM) - same Mach number.