QUALITY OF TERRIGENOUS RESERVOIR OF COLOMBIA'S CARIBBEAN AND PACIFIC MARGINS

MinCiencias Project Convocatoria 877/2020

G MAS SAS, Research Group Category C Recognized by MINCIENCIAS.



AC GP

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El conocimiento es de todos

Minciencias

Project financed with resources from Agreement 785-2019, subscribed by the ANH, the Science Ministry and National Fund for Science, Technology and Innovation Francisco Jose de Caldas.

- BASIS
- SCOPE AND OBJECTIVES
- EXECUTION AND LOGISTICS
 SCIENTIFIC TEAM
 FIELD WORK
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- DELIVERABLES
- SCIENTIFIC KNOWLEDGE CONTRIBUTION
- SOCIAL IMPACT

COORDINATION WITH ACGGP PEDAGOGY PROGRAM



BASIS



Contribution to the knowledge of offshore Colombia reservoir rocks, as key components of the petroleum system.



BASIS

Key factors in sediment generation and evolution





Heins and Kairo, 2007



Reservoir quality is mainly controlled by mineralogy and texture.



POOR QUALITY

Lithics Angular Poor Sorting

GOOD QUALITY



Quartz Rounded Good Sorting

SCOPE

Prediction of reservoir quality in Colombia's Caribbean and Pacific margins.

OBJECTIVES

- 1. Collect 93 samples of beach sediments.
- 2. Study mineral and textural composition of the collected samples.
- 3. Study samples of 10 offshore exploratory wells from the Litoteca. Get porosity data based on electrical logs.
- 4. Perform diagenesis simulation models, using mineral and textural data from the collected samples.
- 5. Consolidate results of the models into regional distribution maps of reservoir quality.
- 6. Preserve samples at the Litoteca for future research projects.
- 7. Publish an atlas of the beach sediments of Colombia, as a contribution to the knowledge of coastal dynamics.



SCIENTIFIC TEAM



Name	profile	experience	institution	roll
Victor O. Ramirez C.	Geologist MSc	28 yr	GMAS SAS	Principal researcher
José M. Jaramillo M.	Geologist PhD	47 yr	GMAS SAS	Senior researcher
Miguel Ramírez L.	Geologist MSc	47 yr	GMAS SAS	Senior researcher
Camilo Dongo	Geofísico	18 yr	GMAS SAS	Senior researcher
Germán D. Moreno B	Geologist MSc	8 yr	GMAS SAS	Co researcher
Iván Ricardo Luna B.	Geologist	2 yr	GMAS SAS	Co researcher
Andrés Felipe Vásquez C	Geologist	2 yr	ACGGP	Junior researcher
Omar Fabián Molina S.	Geologist	2 yr	ACGGP	Junior researcher
Jhon Jaiver Delgado G	Geology student	UniNorte undergrad	ACGGP	Junior researcher
Oscar Daniel Figueredo C	Geology student	UniPamplona undergrad	ACGGP	Junior researcher

EXECUTION AND LOGISTICS

DESCRIPCIÓN ACTIVIDAD	INICIO	FINAL	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Phase 1 Planeación	1/1/2021	4/1/2021	
Socialización del provecto (ANH.SGC.MinMinas, DIMAR)	1/1/2021	2/10/2021	
Procurar Mapas Batimétricos, Meta-Oceánicos	1/1/2021	3/2/2021	
Formalizacion de Contratos Laborales	1/1/2021	2/1/2021	
Seguros ARL (Vida + Médico)	2/1/2021	3/3/2021	
Seguridad (Policia Nacional / Armada)	1/1/2021	2/1/2021	
Viajes (reservación de hoteles, lanchas y vuelos)	1/1/2021	4/1/2021	
Caribe	1/1/2021	2/1/2021	
Pacífico	2/1/2021	3/1/2021	
Bucaramanga	3/1/2021	4/1/2021	
Phase 2 Trabajo de Campo	4/5/2021	8/18/2021	
Recolección Muestras Caribe (2d x muestra)	4/5/2021	5/5/2021	
Turbo: C1-C2-C3-C4 (Dos investigadores x estación)	4/5/2021	4/15/2021	
Montería: C5-C6-C7-C8	4/15/2021	4/25/2021	
Cartagena: C9-C10-C11-C12-C13-C14	4/25/2021	5/5/2021	
Riohacha: C15-C16-C17-C18-C19-C20-C21	5/5/2021	5/15/2021	
Recolección Muestras Pacífico	5/15/2021	6/14/2021	
Tumaco: P1-P2	5/15/2021	5/25/2021	
Guapi: P3-P4	5/25/2021	6/4/2021	
BuenaVentura: P5-P6	6/4/2021	6/14/2021	
Nuqui: P7-P8	6/14/2021	6/24/2021	
BahiaSolano: P9-P10	6/24/2021	7/4/2021	
Litoteca (10 pozos)	4/16/2021	8/18/2021	
Bucaramanga (1d x pozo)	7/4/2021	8/18/2021	
Phase 3 Trabajo de Laboratorio	4/16/2021	2/10/2022	
Preparación de muestras campo [3 x estación = 90] (2d x muestra)	4/16/2021	10/13/2021	
Preparación de muestras pozo [10 muestras x 12pozos = 120] (2d x muestra)	10/13/2021	2/10/2022	
Descripción muestras microscopio binocular	4/16/2021	9/17/2021	
Análisis petrografico y textural de las muestras	5/1/2021	10/28/2021	
Tamizado fracción gravas / finas	5/1/2021	10/28/2021	
Minerales pesados / circones	5/1/2021	10/28/2021	
Bitácora de trabajo laboratorio	4/16/2021	10/28/2021	
PLANTA TALENTIA AND AND	10/00/0001	0.00.0000	
rnase 4 trabajo de oficina	10/28/2021	9/8/2022	
Interpretación e integración de los datos analíticos	10/28/2021	1/26/2022	
Correlación / Comparación de calidad de reservorios entre playa y pozos (porosidades)	10/00/0001	10/07/0001	
Calibración / predicción	10/28/2021	2/12/2021	
Simulación de Diagenesis	2/12/2021	3/12/2022	
Edición del Atles llustrade de musetres de sleve Celembia	3/12/2022	4/11/2022	
Euclon del Atlas hustrado de Indestras de playa Colombia	4/11/2022	7/10/2022	
Preparación presentaciones y ulvulgación científica	4/11/2022	8/0/2022	
Entropy / Presentación MINCIENCIAS	9/0/2022	0/9/2022	
Articulos científicos Bevista Indevada	0/9/2022	9/0/2022	
Curso Diagénesis de Areniscas (U. Erlangen, Nurenberg, Alemania)	9/15/2021	9/22/2021	
AAPG-Convención Anual (Houston)	4/15/2022	4/22/2022	
III Cumbre de Petróleo y Gas (Bogotá)	11/15/2022	11/20/2022	
Congreso Colombiano de Geología (Bogotá)	11/15/2022	11/22/2022	

Execution timeframe



- Logistics Planning
- Field work
- Lab work

Analysis / Interpretation

• Results

FIELD WORK





SAMPLING METHOD



Terrigenos costa afuera Colombia

FIELD WORK

Visit to Core Depository (Litoteca) at Piedecuesta Santander to study selected wells.



Litoteca Nacional, located in Piedecuesta Santander, Parque Tecnológico Guatiguará, Universidad Industrial de Santander UIS.





FIELD WORK

Core and ditch well samples study and selection for lab análisis/ secure porosity logs.



Caribbean wells : Cienaga-1, SantaAna-1, Tairona-1, Arazá-1, Cartagena-1, Morrosquillo-1, Kronos-1, Gorgón-1, Calasú-1, Mapalé-1, Araza-1, Molusco-1, Siluro-1,

Pacific wells Sandi-1, Tambora-1.



LAB WORK





GMAS is a reputed and experienced Geosciences Colombian Lab, founded in 2007, which has provided technical services to oil, mining and academic institution. Expert personnel and state of the art equipment and technology are available for this project.

SAMPLE ANALYSIS WORKFLOW



Terrigenos costa afuera Colombia

DELIVERABLES

- Reservoir quality correlation / comparison
 Properties Calibration / Prediction
 Diagenesis Modeling and Simulation
- Regional maps of reservoir quality
- Atlas of beach sediments of Colombia
- Presentations and scientific divulgation Workshops Training in sedimentology
- Scientific papers for peer-reviewed publications



SCIENTIFIC KNOWLEDGE CONTRIBUTION

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- Two thesis BSc level
- Two thesis MSc level
- Workshops
- Two presentations at technical meetings
- Sedimentology learning through courses and "on the job" training
- Scientific papers
- Beach samples preservation at the Litoteca

SOCIAL IMPACT



Work in coordination with ACGGP pedagogy program

 Presentations of the project / geology topics to communities.
 -Community councils, local authorities, universities, schools, etc.
 -Townhall meetings: Barranquilla, Capurganá, Tolú, Riohacha, Tumaco, Buenaventura, Nuquí, among others.

MAIN PUBLICATIONS OF REFERENCE



Caracciolo, L., D. Chew and S. Ando, 2020, Sediment generation and sediment routing systems, Earth-Science Reviews, https://doi.org/10.1016/j.earscirev.2020.103221.

Heins, W.A., and Kairo S., Predicting sand character with integrated genetic analysis. Geological Society of America, Special Paper 420, 2007.

Magoon, L. B., and W. G Dow, 1994, eds., The petroleum system—from source to trap: American Association of Petroleum Geologists, Memoir 60.

Restrepo J., Franco D., Escobar J., Correa I. D., Otero L., and Gutiérrez J., Cartagena Bay (Colombia): Superficial Sediments Distribution and Sedimentary Environments. Lat. Am. J. Aquat. Res. vol.41 no.1 Valparaíso mar. 2013



Thanks for your time!!!

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