

**IMPORTANT CONTRIBUTIONS IN GEOSCIENCES  
PROMISE TO REVOLUTIONIZE O&G&M EXPLORATION. No 3/6.**

**EDINSON ALVAREZ 1,2**

- 1 Exploration Geologist, O&G&M Specialist,  
Researcher of tectonic and structurally complex areas.
- 2 Expert in geoscientific solutions through integrated O&G&M studies.



**Complex Source Theory (Edinson Alvarez 2025):** A mechanism used by interdisciplinary groups of specialists in any field of science, where new concepts, new methodologies, new technology, and new knowledge are employed, obtaining new results, in order to resolve complex issues.. (Image Courtesy of Pixabay).

**EAST-P Method-Tool (Processing and Seismic Treatment Edinson Alvarez 2025):** It requires specialized personnel, computer equipment and advanced software.

**Edinson Geochemical Hydrocarbon Family Classification Maps -Tool (Edinson Alvarez 2025):** New classification of hydrocarbon families based on geochemical-isotopic-molecular signatures, migration pattern from source rock, their close relationship with geology, geochemical modeling of generation, expulsion, and hydrocarbon migration routes in a regional context.

**Integrated O&G&M studies - Onshore-Offshore-Tool:** It involves the participation of more than 20 geoscience disciplines, in order to find answers to complex industry problems, with strong positive economic implications.

## **INTRODUCTION**

The Sinú San Jacinto SSJ basin and the lower Magdalena Valley Basin, according to C-R Posada Saldarriaga et al. 2024, offer significant hydrocarbon prospectivity potential estimated for VIM at 3.18 tcf for Gas and 0.731 tcf Wet Gas, and a lower value than this range is estimated for SSJJ. According to ANH 2022, the values for Oil are 2,165 and 4,922 Mmboe respectively. Different studies by Explorasur-ANH 2012-2013, among others, report important surface sources of crude oil and gas, in addition to the existence of important O&G fields in the area.

The purpose of this work is to contribute to the knowledge of the Sinú San Jacinto Fold Belt Border Basin, SSJFB. In the onshore Colombian Caribbean. It highlights the different companies, institutions, entities, and individuals that have contributed to the development of knowledge in this Basin, such as the National Hydrocarbons Agency (ANH), the Colombian Geological Service (SGC), the Colombian Institute of Petroleum and Transition Energies (ICPET), and the Colombian Petroleum Company (Ecopetrol), Caldas University, its Institute of Stratigraphic Research IIES, National University of Colombia (UNAL), Industrial University of Santander (UIS), Pedagogical and Technological University of Colombia (UPTC), EAFIT University, among others...

To generate a revolution or a transcendental change in a system, giants must be overthrown. In this case, we will call giants ( Concepts, techniques, technologies, methodologies, procedures, tools, etc.). We take this opportunity to pay tribute to one of the greatest writers of universal literature, Miguel de Cervantes Saavedra (1547-1616), with his masterful work, Don Quixote de la Mancha (1605). The above is intended to introduce the reader with a fun, artistic touch, and then move on to the deeper technical side that interests us. We invite you to look on the bright side of history, which are the contributions of geosciences to our country, Colombia.

## **METODOLOGY**

To overcome the structural and stratigraphic obstacles and difficulties posed by the tectonic and structural complexity of the area, the following activities are carried out:

- Compilation of information from oil exploration, geochemical, geophysical, geological, stratigraphic, tectonic-structural, petroleum systems, and other studies in the study area.
- As part of the author's independent professional activity, several integrated studies have been conducted to address the issue of tectonic structural complexity of the study area and its implications for oil and gas exploration and production in Colombia, and in this case the Sinú San Jacinto Fold Belt (SSJFB) frontier basin, reaching important conclusions. This work has also been extended to other oil and mining basins in the country.

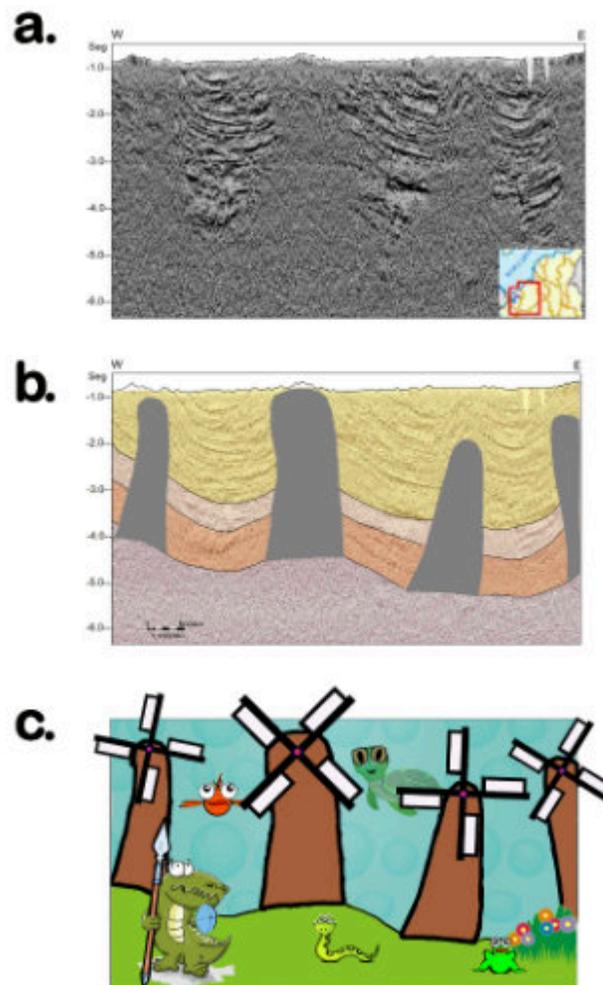
## **RESULTS**

### **1. The Mud Diapirs and Mud Volcanoes of the Colombian Onshore Caribbean:**

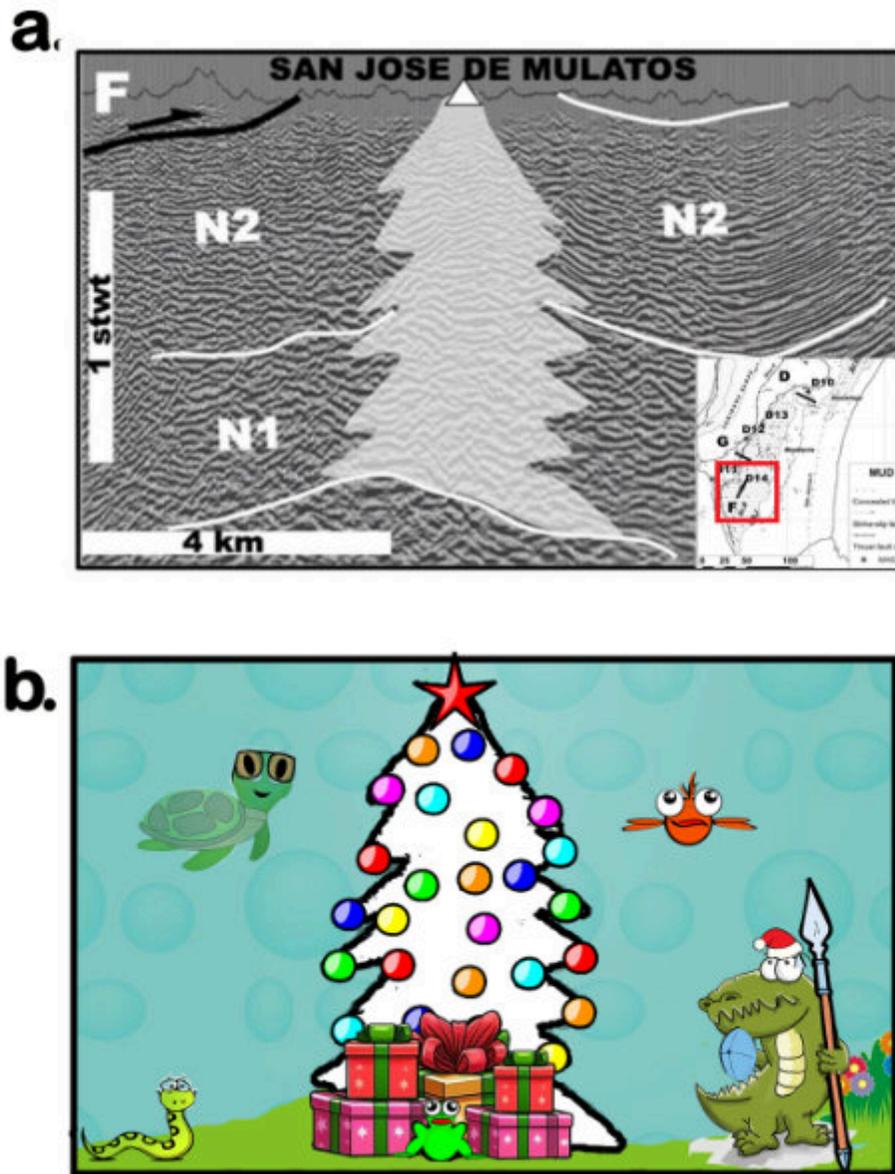
In reports submitted to Ecopetrol during the years 2022-2023-2024, it was noted that, through the studies conducted by the Author, the quality of seismic images in areas of tectonic-structural complexity in Colombia was 35-40%. And how the **EAST-P Method (Processing and Seismic Treatment Edinson Alvarez 2025)** overcame this problem.

It was also reported that some methodologies sacrificed the structural aspect, imposing the stratigraphic aesthetic aspect, thereby seriously affecting the exploration-production results.

The above gains significance when it comes to demolishing the first giant in this chapter: the onshore mud diapirs in the Colombian Caribbean. In 2021, the ANH and the Colombian Geological Service-SGC presented their work on mud diapirs in the Sinú San Jacinto Basin, and the ICP- Ecopetrol did the same. Figures 1 and 2.

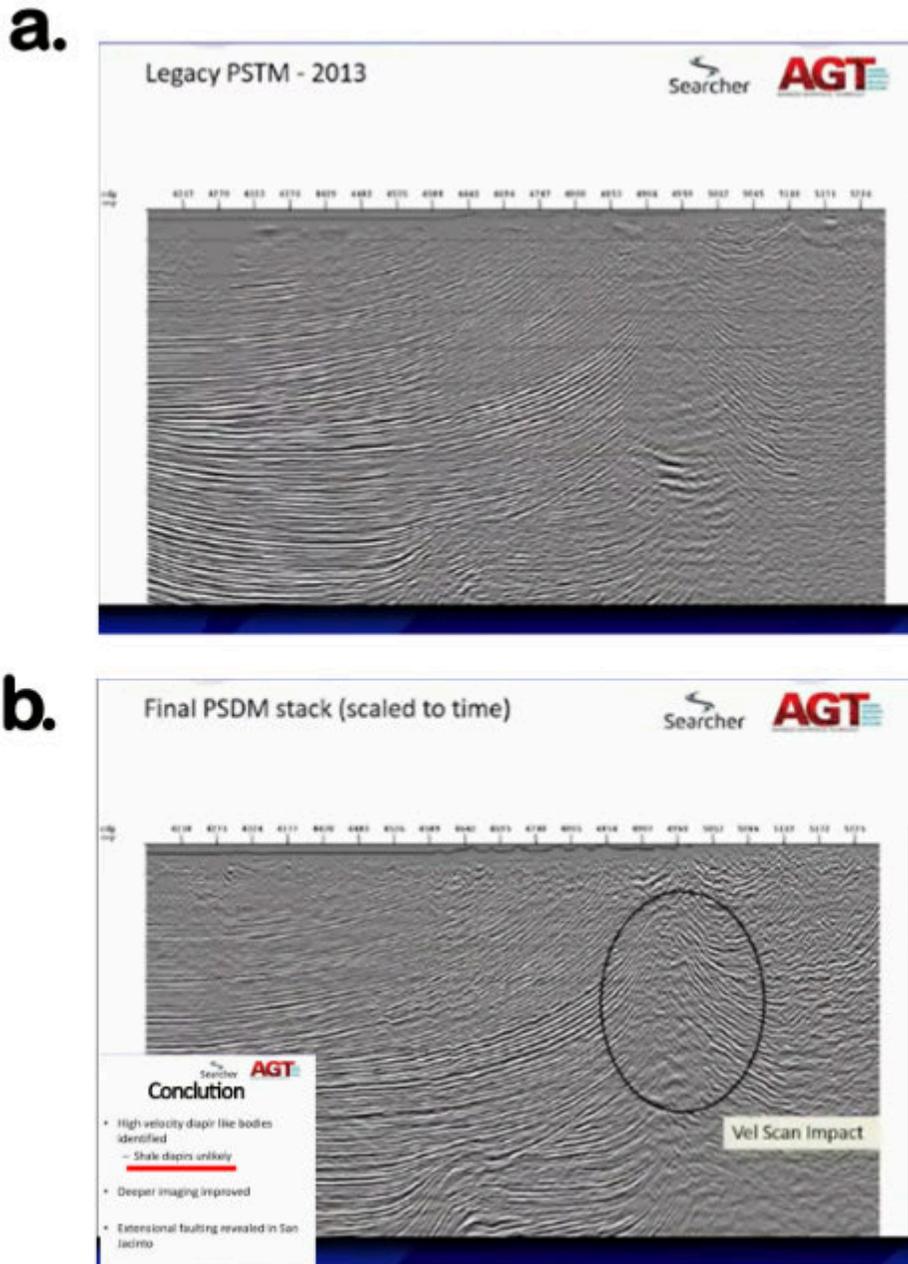


**Figure 1.** a. Seismic line of the Sinú San Jacinto Fold Belt sector, southern sector ANH-SGC-2021. Uninterpreted b. Interpretation of the seismic line of the Sinú San Jacinto Fold Belt , southern sector ANH-SGC-2021. c. Quixotic version in honor of Miguel de Cervantes S. (Diagram integrated with images from different authors - courtesy of Pixabay.com).



**Figure 2. a.** Interpretation of the seismic line of the Sinú San Jacinto Fold Belt, south sector. ICP-ECOPETROL 2022. **b.** Quixotic version in honor of Miguel de Cervantes S. (Diagram integrated with images from different authors - courtesy of Pixabay.com).

The truth is that the bodies called mud diapirs do not exist in the form expressed in the interpretation (Figures 1b, 2a), **Important highlights of this valuable work include the establishment of the detachment depths for each of the mud volcanoes and the geochemical analysis.** Mud volcanoes do exist, and the mechanism that feeds them is through the main faults and the fracture system, through which waters enriched with mud, minerals, hydrocarbons, etc., rise to the surface, completing the hydrologic-hydrogeologic-geothermal cycle. Supported by the following evidence (Figure 3):



**Figure 3. a.** Legacy seismic image 2013 without location in the Sinú San Jacinto Fold belt basin by Searcher-AGT 2024. **b.** Reprocessed seismic image 2022, published 2024, without location in the Sinú San Jacinto Fold belt basin by Searcher -AGT 2024. Conclusions of the reprocessing work says Mud diapirs unlikely.

Conclusion that agrees with what was mentioned in the reports sent to the Ecopetrol company (2022-23-24), as mentioned above, in relation to the CST's EAST-P Method. In addition, in 2013, Halliburton interpreted seismic lines in the southern sector of the Sinú San Jacinto Fold Belt Basin, nor did it report mud bodies or mud diapirs. (See Figures 5e, 8e). As concluded by Searcher -AGT 2024.

## 2. Integrated Studies for O&GM Exploration and Production.

With the giant mud diapirs demolished, we'll move on to the topic at hand. **Where is the Sinu San Jacinto Basin's oil and gas? Why are they afraid of the Sinu San Jacinto Basin? (Figure 4).**



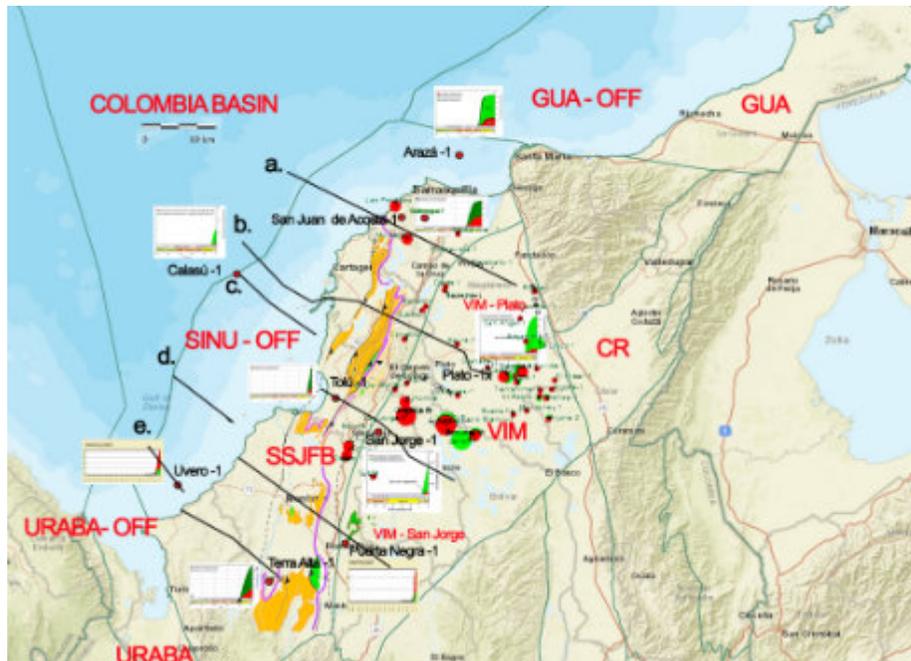
**Figure 4.** Oil companies abandoned the Sinú San Jacinto Round. El Tiempo newspaper published on November 8, 2018.

To address this issue, we'll turn to the various integrated charts. Figures 5, 6, 7, 8, 9, 10, 11.

Figure 5 shows the location of the seismic lines used in this work, in order to show the regional trend of hydrocarbon flow towards the Sinú San Jacinto Fold Belt-SSJFB basin (See Figure 8). It also locates some wells around and within the basin, with its oil and gas expulsion calculation graph, showing how the entire area potentially presents hydrocarbon source or producing rocks. As well as the oil and gas fields, and some wells with manifestations.

Figure 6 shows the hydrocarbon generation kitchen in and around the Sinú San Jacinto Fold Belt (SSJFB) basin. Migration routes are shown in plan view. Note how the surrounding kitchen area is almost three times the size of the kitchen present within the basin, with the positive implications this represents, as we will see later.

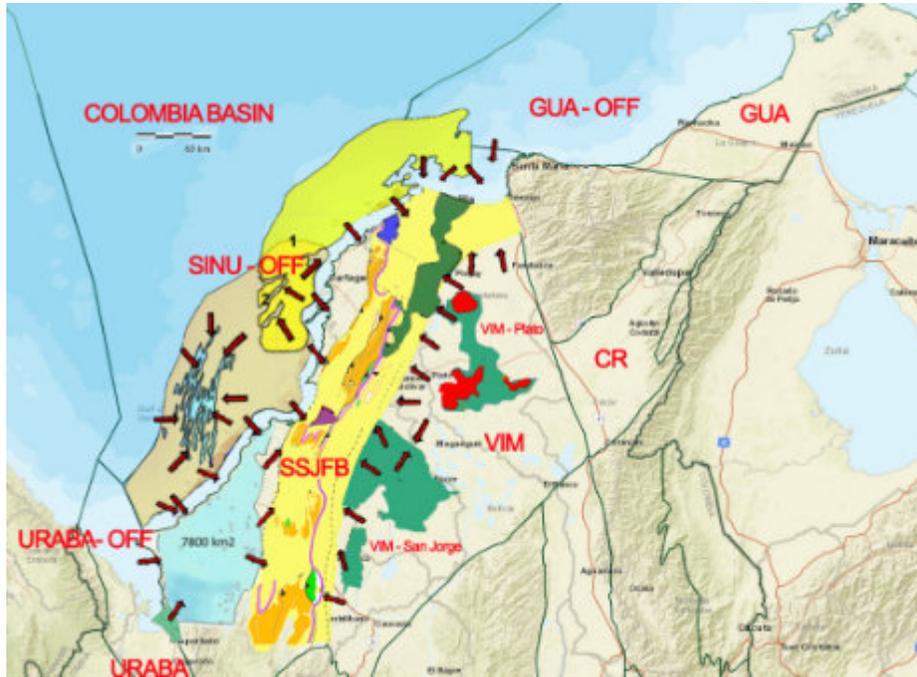
Figure 7 shows the generation and trapping modeling, as well as the hydrocarbon migration routes for the Sinú San Jacinto Fold Belt-SSJFB basin and surrounding basins (The layer lying on the basement top was used and in other cases the Oligocene-Miocene layer, which varies in age depending on its presence in the basin, integrating it for the visual effect of the general regional migration).



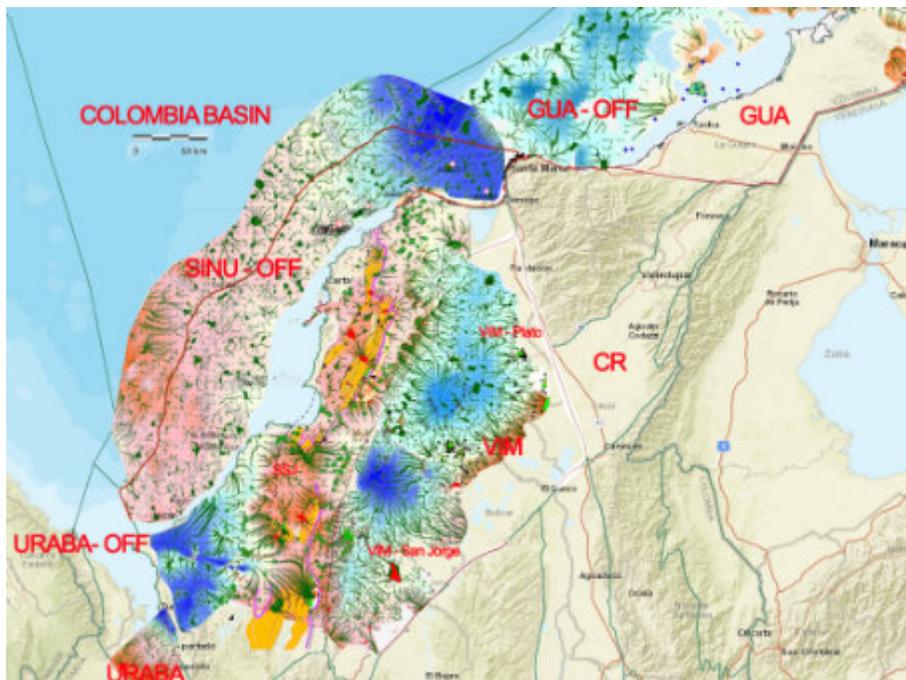
**Figure 5.** Location of seismic lines from north to south in the Sinú San Jacinto Fold Belt (SSJFB) Basin. Location of wells and graph of oil and gas ejections surrounding the SSJFB Basin. O&G Fields ( Base Map ANH 2025, Mora–Bohórquez, J.A et. al 2025,2020,2017, Flinch, J., 2003 , ANH-Schlumberger 2013, ANH-Halliburton, 2013a,b, ANH-Meridian-Pangea 2013, IIES-ANH 2020 a,b, Neil Hodgson, Karyna Rodriguez and Andres Mesa. 2023)

Figure 8 Shows the regional dip and depth trend of the layers in the seismic profile as possible hydrocarbon migration routes towards the Sinú San Jacinto Fold Belt- SSJFB basin, in the topographically highest part of the basin. It is observed that for images c. d. e. (Offshore Part), it shows a regional pattern of faults dipping towards the east. However, it is clarified in this report that according to the complex source theory SCT, it is necessary to record or map both the antithetic faults that dip in the opposite direction, as well as a set of faults detected by the EAST-P method of the SCT, which dip towards the west, therefore with these sets of missing faults to be recorded in these areas we have hydrocarbon migration both to the west and to the east in the direction of the Sinú San Jacinto Fold Belt- SSJFB basin, as indicated in the graphs. **Demolishing this Second Giant, from the missing set of faults to be interpreted.**

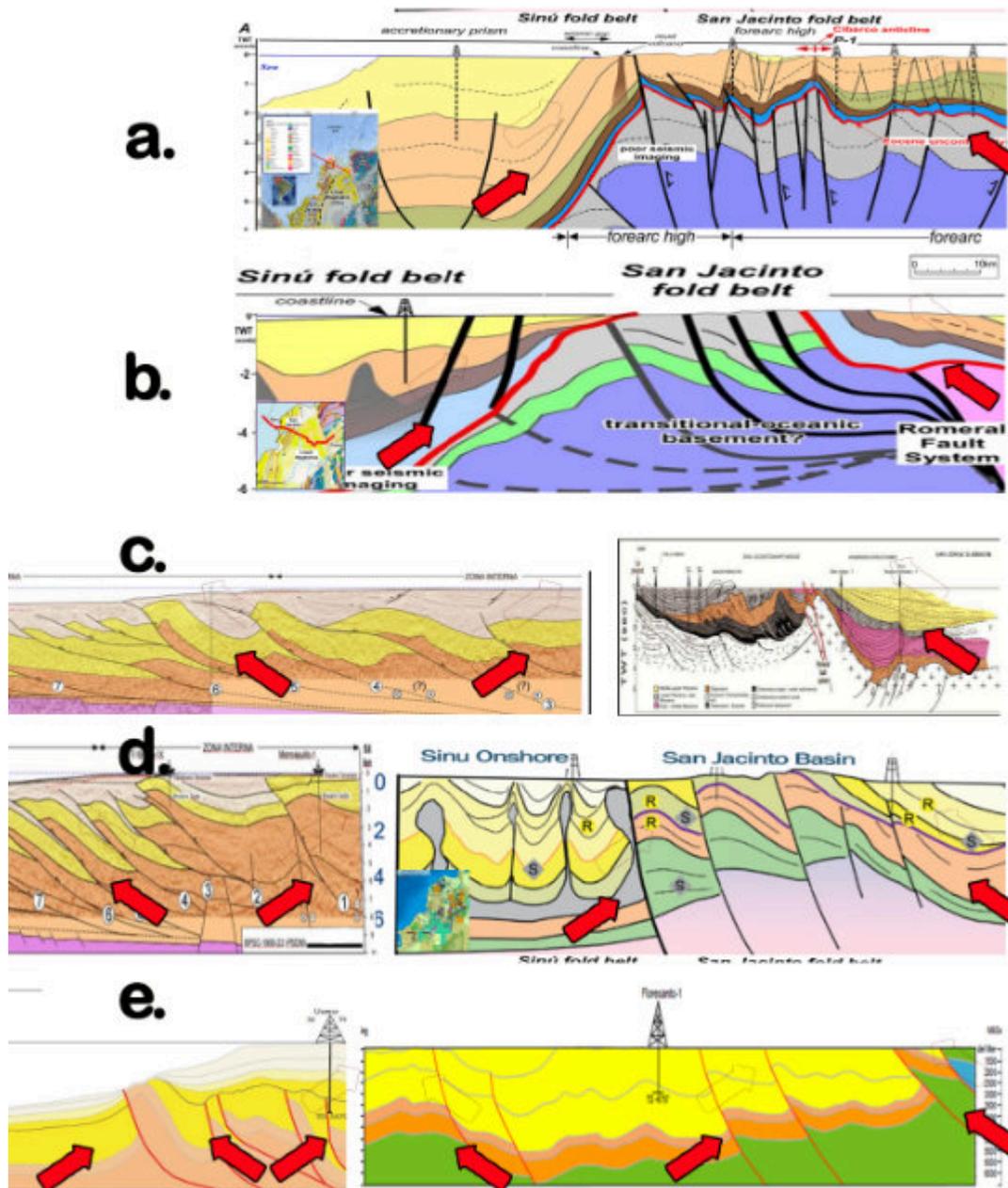
Figure 9 shows a new hydrocarbon family classification for the Sinú San Jacinto Fold Belt-SSJFB basin, called the **Edinson Geochemical Hydrocarbon Family Classification Maps**, which integrates the relationship between traditional geochemical-isotopic-molecular classification analyses with geology, generation kitchens, generation modeling, and hydrocarbon migration pathways, with 10 hydrocarbon subfamilies, distributed in four large groups. Traditional interpretation models typically yield or result in the presence of two or three hydrocarbon families. (See Figure 9 a and b.)



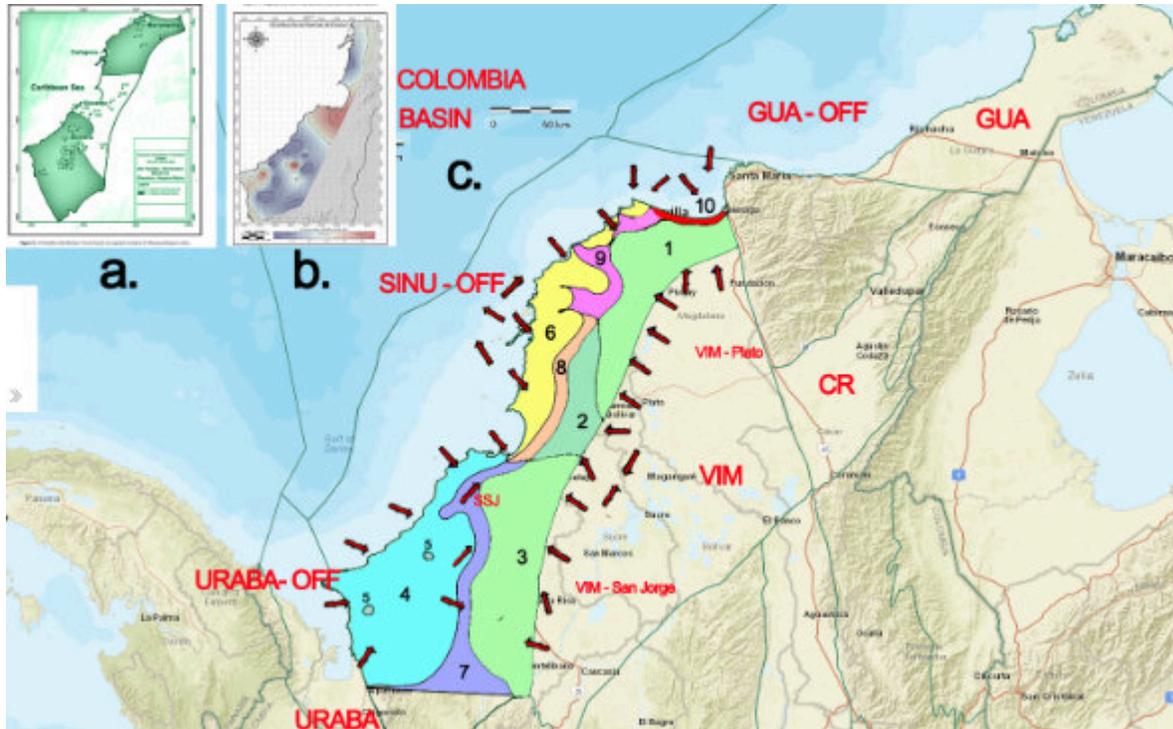
**Figure 6.** Hydrocarbon Generation kitchen in and around the Sinú San Jacinto Fold Belt Basin -SSJFB. ( Base Map ANH 2025, Mora–Bohórquez, J.A et. al 2025, 2020, 2017, Flinch, J., 2003 , ANH-Schlumberger 2013, ANH-Halliburton, 2013a,b, IIES-ANH 2020 a,b, Neil Hodgson, Karyna Rodriguez, Andres Mesa. 2023)



**Figure 7.** Modeling of hydrocarbon generation, migration, and accumulation in and around the Sinú San Jacinto Fold Belt basin -SSJFB. ( Base Map ANH 2025, Mora–Bohórquez, J.A et. al 2025, 2020, 2017, Flinch, J., 2003 , ANH-Schlumberger 2013, ANH-Halliburton, 2013a,b, IIES-ANH 2020 a,b, Neil Hodgson, Karyna Rodriguez, Andres Mesa. 2023)



**Figure 8.** Seismic lines **a. b. c. d. e.** (location **Figure 1**), showing the regional hydrocarbon migration trend, correlatable with **Figure 6**. For the Sinú San Jacinto Fold Belt-SSJFB basin. Modified from ( Mora-Bohórquez, J.A et. al 2025, 2020, 2017, Flinch, J., 2003 , ANH-Schlumberger 2013, ANH-Halliburton, 2013a,b, IIES-ANH 2020 a,b, Neil Hodgson, Karyna,Rodriguez, Andres Mesa. 2023)



**Figure 9.** a. Modified from Jose Osorno , Antonio Rangel.2015.ANH-Halliburton, Hydrocarbon family map (Two Families). b. Julián L. Mesa R, Silvia C. Pico R. 2017, UIS-Frontera Energy. Hydrocarbon family map (Two-three Families). c. Edinson Geochemical Hydrocarbon Family Classification Maps, with 10 hydrocarbon subfamilies, distributed in four large groups. To compare with figure 6,7.

This Edinson geochemical hydrocarbon family classification map offers the following classification:

Group A: 1-VIM Plato, 2- VIM Plato-VIM San Jorge Mix, 3- VIM San Jorge

Group B: 4-Sinú Sur, 5- Sinu Sur-Sinú Offshore-Urabá? Mix

Group C: 6- Sinú Offshore

Group D: 7- VIM San Jorge-Sinú Sur Mix

8- VIM Plato-VIM San Jorge-Sinú Offshore Mix

9- VIM Plato-Sinú Offshore Mix

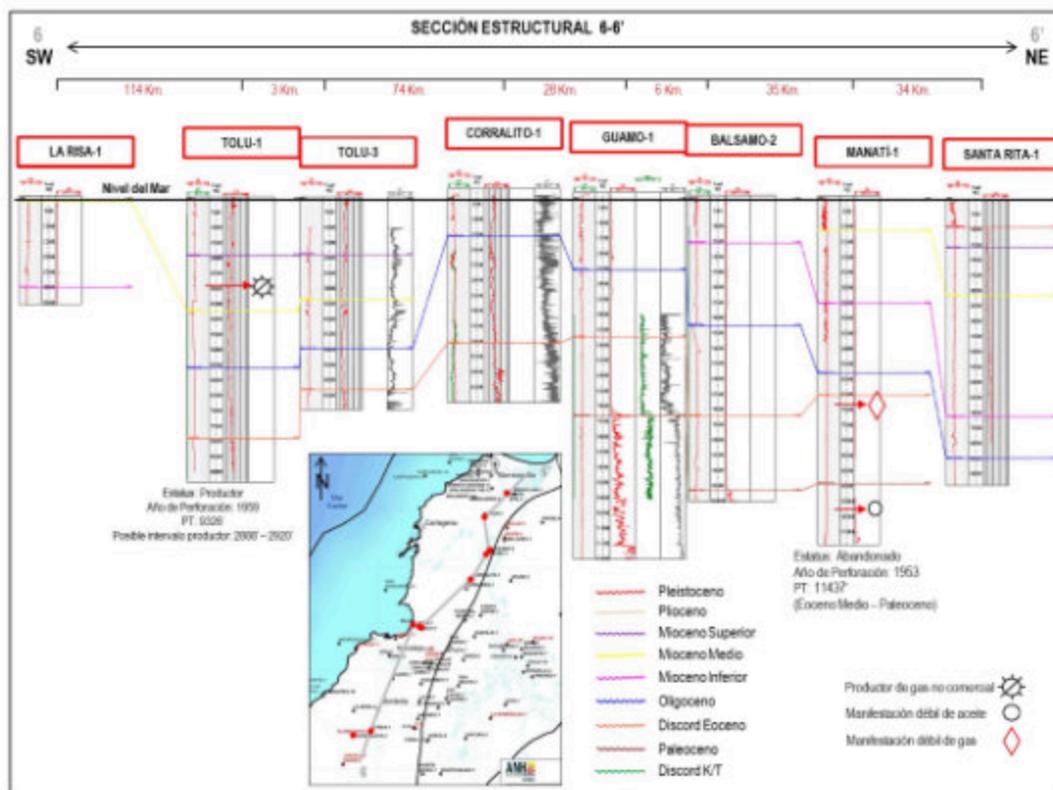
10- VIM Plato-Sinú Offshore-Guajira Offshore Mix

While ANH-Halliburton 2013 and Julián L. Mesa R, Silvia C. Pico R. 2017. UIS-FRONTERA ENERGY. They offer a traditional hydrocarbon classification of two or three families, (See Figure 9 a.b.), which is very good for the reference parameter used. However, the data obtained is simple and basic. **While the Edinson geochemical map of hydrocarbon family classification offers a greater scope, and can be used as a tool to assist in the interpretation of exploration and drilling targets in the basin.** (It is clarified that this last classification map was generated from the very important free data provided by the research work of (Julián L. Mesa R, Silvia C. Pico R. 2017, UIS-FRONTERA ENERGY.)

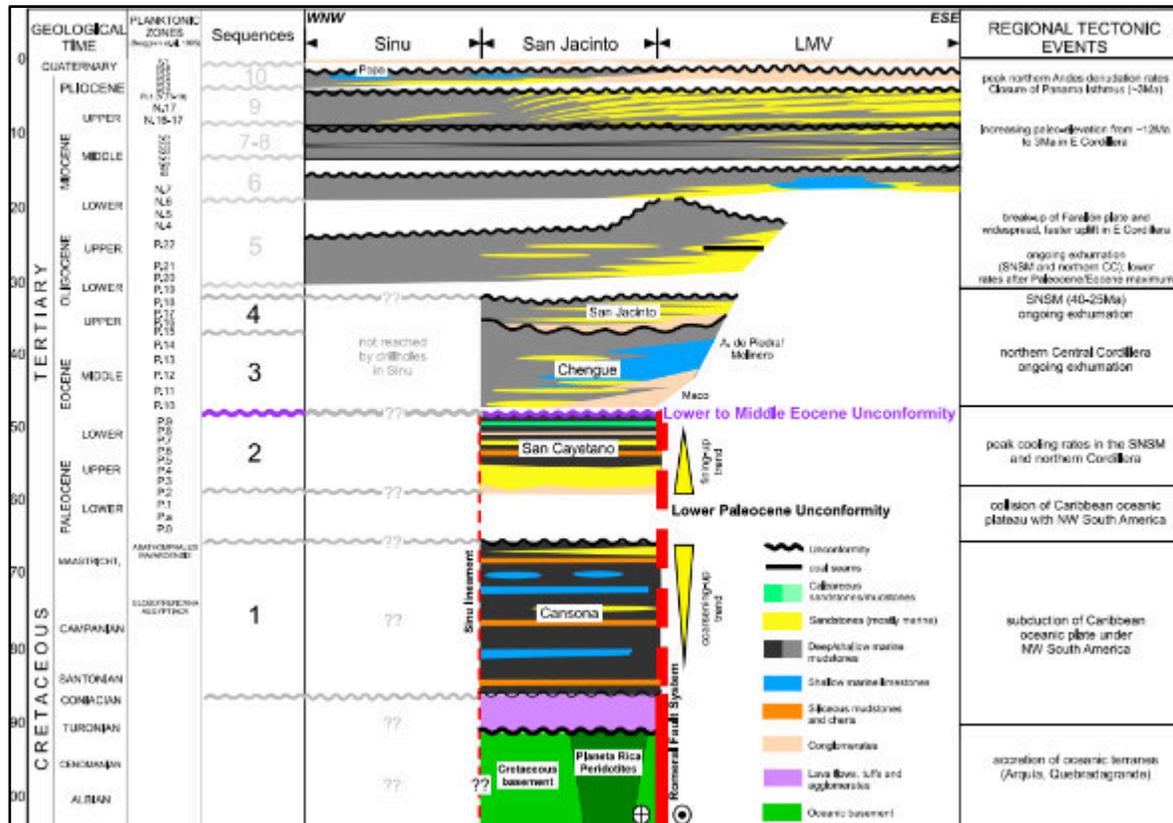
It should be noted that map **figure 9**, in its northern Barranquilla-Bullerengue sector, was designed based on indirect data. (Therefore, upon entering this data, there is likely to be a change in the sector - a small strip to the north.) Likewise, the mixing corridor can be modulated (expanded) according to the client's requirements, based on the different results of the geochemical-isotopic-molecular data.

The interesting and important aspect of this new classification methodology (at least not recorded in the studies analyzed for Colombia) is that it fits very well with geology, generation kitchens, generation-expulsion modeling, and hydrocarbon migration routes. **This helps validate the results, thereby overthrowing the third giant of traditional hydrocarbon family classification. It is also one of the few cases worldwide where the geochemical footprint or trace of the hydrocarbon can be clearly seen, related to geology, kitchens, geochemical modeling of generation and expulsion, and hydrocarbon migration routes.**

Figure 10 shows a stratigraphic correlation of wells in a south-north location within the Sinú San Jacinto Fold Belt (SSJFB) basin. Taken from ANH-Halliburton 2013. The main idea of the graph is to observe that the vast majority of wells drill up to the Eocene unconformity, and very few have drilled into the Paleocene-Cretaceous sequence (see Figures 10 and 11).



**Figure 10.** Stratigraphic correlation of South-North wells in the Sinú San Jacinto Fold Belt basin SSJFB, taken from ANH-Halliburton 2013.



**Figure 11.** Stratigraphic Column of the Sinú-San Jacinto Basins–Lower Magdalena Valley. Modified from A. Mora et al 2017.

As mentioned above, the stratigraphic sequence below the Eocene (Figure 11) is virtually unexplored. There, we can find the following Petroleum Systems, proposed from the analysis of this study.

1. Oceanic Basement – Cansona (?): Fractured basement reservoir rock, source rock-seal of the Cansona Formation. (Pre-Cretaceous-Cretaceous)
2. Intra-Cansona (?): Turbidite reservoir rock, sandy channel deposits, slope deposits, and some intra-Cansona calcareous-limestone levels. Source rock-seal of the Cansona Formation. (Cretaceous)
3. Cansona-Lower San Cayetano(?): Reservoir rock, sandy platform deposits, and conglomerates of the San Cayetano Formation. Source rock-seal of the Cansona-San Cayetano Formation. (Cretaceous-Paleocene)
4. Upper San Cayetano-Maco-Chengue (?): Reservoir rock, sandy platform deposits, conglomerates, and calcareous sands of the upper San Cayetano Formation, sandy deposits, and conglomerates of Maco Formation, Source rock-seal of the San Cayetano-Chengue Formation. (Paleocene-Eocene).

Most of these have been described by ( ANH-kuenka 2015, Mora–Bohórquez, J.A et. al 2025, 2020-2017, Flinch, J., 2003 , ANH-Schlumberger 2013, ANH-Halliburton, 2013a,b, IIES-ANH 2020 a,b).

## DISCUSSION

The Sinú San Jacinto Fold Belt Basin presents great potential for the storage and production of Hydrocarbons (Oil and gas), however to date only one producing field has been discovered and developed (Bullerengue wells field), which represents approximately 1% of gas production nationwide. **According to a 2020 ANH-Universidad de Caldas study, prospective resources are estimated at around 4,922 MMboe.** Despite this, and with more than 100 years of history, with approximately 292 wells drilled to date (por BIP banco de información petrolera, 2025), in a Basin of 39,476 km<sup>2</sup>, it indicates that we have 1 well for every 135 km<sup>2</sup>, which means that there is much left to do and many exploratory opportunities to be realized.

Thanks to the studies carried out by the companies and institutions mentioned in the introduction, together with the advances, developments and studies carried out by the author, it has been possible to demolish several Giants (theories, concepts, methodologies, procedures, techniques), which, without malicious intent, but rather due to a lack of technology and/or related issues, have been an obstacle or a disincentive to the oil development of the Basin.

Despite the progress in different science areas, even as of the date of this 2025 report, Hocol (a subsidiary of Ecopetrol) continues to face several uncertainties regarding the petroleum system, including the structural and stratigraphic complexity, the low resolution of seismic images, and a lack of understanding of some related issues. ( **Josue Alejandro Mora-Bohorquez, Federico Moreno, Mauricio Ibanez, Luis Santamaría, Rigo Ramírez, Jhan Carlos Barbosa, Juan Diego Gongora, Daniel Sierra, Gabriel Veloza. 2025. Dating the Chengue/Arroyo de Piedra formation of the northern San Jacinto foldbelt: Results of the application of in situ U-Pb carbonate geochronology in NW Colombia. 19 p. <https://doi.org/10.1016/j.jsames.2025.105355>**)

The integration of knowledge developed through Complex Source Theory (SCT) and its various advanced tools allows us to shed light and answer all the questions that have troubled geoscientists and oil explorers for over a hundred years on issues related to the exploration-drilling-production cycle in the Sinú San Jacinto Fold Belt (SSJFB) basin. Figures 5, 6, 7, 8, 9, 10, 11. (The same treatment has been applied to all other oil and mining basins in Colombia, Foothill, Llanos, VMM, VSM, PUT, CAT, CR, GUA OFF, SINU OFF, COL OFF.)

The interpretation of the graphs in plan and seismic profile, show how the Sinú San Jacinto Fold Belt SSJFB basin, enjoys a privileged position, both geographically and topographically, being the cusp or high part topographically speaking, where the regional flows or regional migration of hydrocarbons from the surrounding basins are directed, with the following approximate participations in the contribution area (Figures 5,6,7,8,9):

1. Lower Magdalena Valley Basin. 50% (Plato and San Jorge sub-basin)
2. Uraba-Uraba Basin Offshore. 30-40%
3. Sinú Basin Offshore. 35-45%
4. Guajira Basin Offshore. 5-10%

These flows, confirmed through thermodynamic and geochemical modeling of hydrocarbon generation and expulsion, migration routes, and hydrocarbon entrapment, are integrated at

the regional level (Figures 6 and 7). This is confirmed by Edinson's geochemical maps (Figure 9) and by the regional migration trend in seismic profiles (Figures 5 and 8).

**It is worth highlighting the Edinson's geochemical maps (Figure 9) that this is one of the few results worldwide where the chemical-isotopic-molecular signature of hydrocarbons demonstrates the migration trail from the source and its close relationship with the geology and geochemical modeling of generation, expulsion, and migration routes.** This demonstrates the influx of hydrocarbon resources from outside the basin. This is a difficult case to record in other environments, where the complexity of the hydrocarbon mixture and the tectonic, structural, and stratigraphic complexity of the area prevent this geochemical signature from being clearly visualized, as is the case in this study. **A global case.**

**The above clearly indicates that the prospective resources for the SSJFB basin may be two to three times greater than the significant prospective resources indicated by the ANH-Universidad de Caldas 2020 study, on the order of 4,922 MMboe (depending on the efficiency of the system).** This study was local, limited only to the Sinú San Jacinto Fold Belt Basin. This report complements this information and clearly demonstrates the influx of hydrocarbon resources from the various surrounding basins.

Based on the above, **where is the Basin's oil and gas? Why did the oil companies withdraw from the 2018 Sinú San Jacinto round? Why do J. A. Mora-Bohorquez et al., 2025, and the geoscientific team from Hocol (a subsidiary of Ecopetrol) say they have serious unanswered questions about the Basin's petroleum system?**

The answer becomes logical, simple, and valuable in light of Complex Source Theory (CST) and its advanced tools, as you will see in the concluding section of this study.

A more detailed analysis and solution to problems of high structural and stratigraphic complexity can be consulted with the author of this article.

## CONCLUSION

Complex Source Theory (SCT) and its advanced tools demonstrate their value in this report, contributing to the knowledge and understanding of the Sinú-San Jacinto Fold Belt, located on the Colombian Caribbean Onshore, and contributing to the country's geoscientific knowledge and development. **This will serve to ensure the nation's energy, economic, and social sustainability.**

We have proven, through the reports and studies submitted to Ecopetrol in 2022-23-24, how the SCT's postulates have been corroborated and proven over time, revealing its predictive power. And in this article, **in honor of Miguel de Cervantes Saavedra and his work, we verify the demolition of several Giants for the area** (We will call Giants: Concepts, techniques, technologies, methodologies, procedures, tools, etc.).

1. **Giant Mud Diapirs:** The East-P method has shown that they do not exist in the shape and size as indicated by the ANH-SGC 2021 and ICP-ECOPETROL 2022 studies, corroborated by the Searcher-AGT 2024 presentation, and ANH-Halliburton 2013 presentation. (Figures 3b and 8e of this report).
2. **Giant set of faults not recorded or mapped in seismic interpretations:** A set of unrecorded west-dipping faults in the offshore images in Figure 8 are the antithetic faults (supported by laboratory-structural rule tests), and a set of independent west-dipping unrecorded faults (found by the SCT East-P method). These are important because they help direct hydrocarbon migration toward the Sinú San Jacinto Fold Belt.
3. **Giant Traditional hydrocarbon family classification:** Geochemical studies of hydrocarbon family classification are traditional and indicate the existence of two or three hydrocarbon families in the Sinú San Jacinto Fold Belt Basin. This becomes a simple and basic reference. In this study, we present a new method of hydrocarbon family classification: The Edinson Geochemical Map of Hydrocarbon Family Classification offers a broader scope and can be used as a tool to assist in the interpretation of exploration and drilling targets. 10 subfamilies are obtained within four hydrocarbon families or groups of families. (Figure 9).
4. **Giant Prospective Resources:** These flows, verified through thermodynamic and geochemical modeling of hydrocarbon generation and expulsion, migration routes, and hydrocarbon entrapment, integrated at the regional level (Figures 6 and 7), are reconfirmed through Edinson geochemical maps (Figure 9) and the regional migration trend in seismic profiles (Figures 5 and 8).

**This clearly indicates that the prospective resources for the SSJFB basin could be two to three times greater (9,844 to 14,766 MMboe, depending on the efficiency of migration),** complementing the good news reported by the ANH-Universidad de Caldas 2020 and ANH 2022, where prospective resources are estimated at around 4,922 MMboe.

5. **Giant Where the Hydrocarbon Is in the SSJFB Basin:** The entire analysis indicates that the hydrocarbon is encapsulated and/or stored in the four petroleum systems and plays located below the Eocene unconformity (Figure 11).

**As mentioned above, the stratigraphic sequence below the Eocene (Figure 11) is virtually unexplored. This coincides with what was proposed by ANH-KUENKA (2015) on this topic.**

**Durante más de 100 años, la exploración en estas cuencas se ha concentrado en un sistema de trampas-reservorios post-Eoceno, sin embargo la evidencia geológica y los datos geoquímicos sugieren que existen grandes posibilidades de encontrar reservas importantes asociadas a sistemas pre-Eoceno, los cuales están prácticamente inexplorados en la cuenca.**

In addition to the above, there are other petroleum systems, plays and areas of significant interest yet to be explored, which can be discussed with the author of this article. Considering the tectonic-stratigraphic and structural complexity, this indicates that other petroleum systems and plays may have fed these last four mentioned.

6. **El Coco Giant - The Tectonic-Structural and Stratigraphic Complexity reported by Mora-Bohórquez, J.A et. al. 2025 and the Geoscientific team of Hocol (a subsidiary of Ecopetrol):**

The entire analysis indicates the presence and existence of active petroleum systems in the SSJFB Basin. However, if we look at Figure 7, we can see that almost all of the hydrocarbon prospects or accumulation zones proposed by the geochemical modeling of hydrocarbon generation, expulsion, and migration in the Sinú San Jacinto Basin, conducted by the ANH-Universidad de Caldas 2020, have already been drilled, resulting in dry or non-commercial production, with a few still to be drilled.

**So, once again, we ask ourselves, ¿Where is the hydrocarbon oil and gas in the Sinú San Jacinto Basin?"**

The good news is that Complex Source Theory (SCT) and its advanced tools provide solutions for areas of tectonic, structural, and stratigraphic complexity, as noted in article number two in this series.

The Good News is that by applying the SCT EAST-P method, it is possible to answer most of the uncertainties and questions raised by Hocol 2025 Geoscientist team (Ecopetrol Subsidiary), by improving the quality of the seismic image, achieving a detailed tectonic-structural-stratigraphic interpretation (With a large quantity, orientation and arrangement of faults and geological structures, consistent with the faults mapped on the surface, which shows a complex character of the area, as has been stated. An important aspect totally absent in the interpretations made in previous years Figures 1a, b, c, d, e, f, g.), data that allow to define how the petroleum system is functioning, finding different types of structural, stratigraphic, mixed traps, as well as different amplitude anomalies that include Bright Spots, gas chimneys, and migration routes consistent with fluid accumulation and amplitude anomalies reported in the ANH report 2022. We have also managed to identify several prospects of varying size, some of them kilometers long and very thick. **If confirmed through drilling, these prospects would significantly contribute to the country's energy**

**sustainability and development. We could be talking about the largest O&G discovery not only in the Sinú San Jacinto Basin in the Colombian Caribbean onshore, but also nationally, meeting all the requirements for it...**

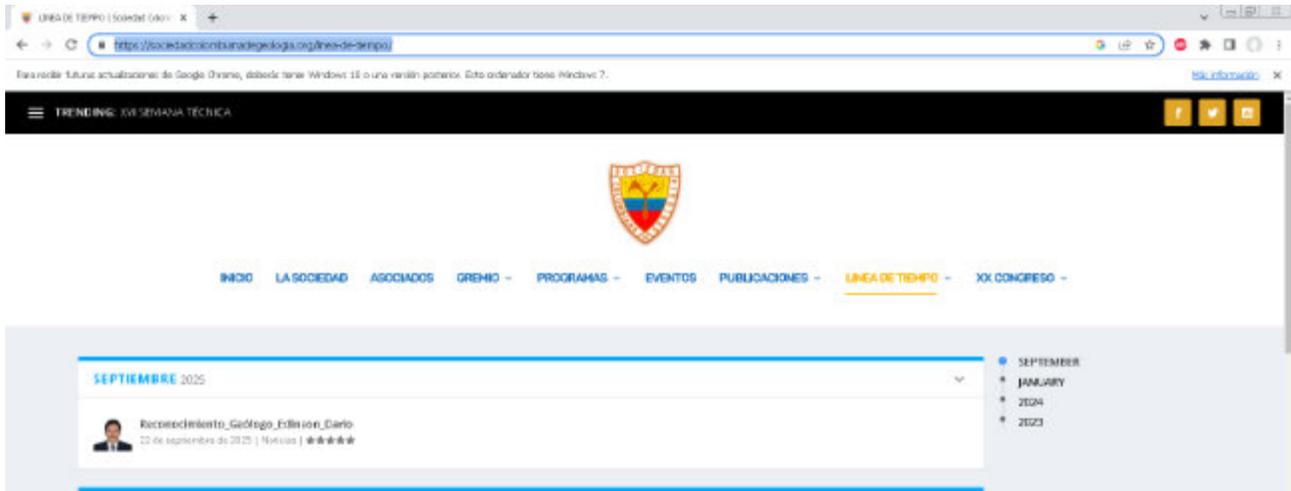
This methodology also applies to complex areas such as salt belts (pre-salt), the Gulf of Mexico, Gulf of America, Brazilian coast, African coast, the Mediterranean, the Alaska-Canada coast, Rocky Mountain ranges and foothills, Andes, Atlas, Himalayas, the Arabian Peninsula, among others, as well as to areas of low or minimal tectonic structural complexity. Also the increased production in complex fields, reconfirming and refining the geological and geomechanical models of fields that present this problem of double and even triple interpretations and models.

**The SCT's EAST-P method was proposed to Ecopetrol in April 2024, for a value comparable to the transactions of large technology companies. This value logically exceeds the company's economic and financial capabilities, for this reason we invite to @Pötus, Forbes List and Giants Companies to participate in this development.**

The technical support has deserved him recognition for his contributions to geoscientific knowledge of Colombia by important personalities and entities. ( Article number one-Maya journal of geosciences September edition 2025, pag. 154, Art-1/6 ), <https://revistamaya.com/wp-content/uploads/2025/08/Revista-Maya-Geociencias-Septiembre-2025.pdf>.

Article number two-(Pp-37-47):<https://revistamaya.com/wp-content/uploads/2025/09/Revista-Maya-Geociencias-EDICION-ESPECIAL-XXV-2025.pdf>.

The prestigious **Colombian Geological Society (SCG)** has joined in disseminating the recognition and results of the research work through publication on its website. Link:[https://sociedadcolombianadegeologia.org/reconocimiento\\_edinson\\_dario/](https://sociedadcolombianadegeologia.org/reconocimiento_edinson_dario/)



**Note 1:** This article commends the work of Searcher-AGT 2024, a company dedicated to finding solutions for improving seismic imaging, while clarifying that your purpose is not advertise. Public images have only been used to highlight their important results. This is to point out that if you look closely at the images (Figure 3 a and b), you can see the structure faintly in Figure a, which is subsequently enhanced in the image in b. It should be noted that although the results are very good, they are not comparable with the results obtained using the SCT's East-P method for complex areas. (Clarification only with interest and technical vision).

**Note 2:** An internet search was conducted on the proposed topic (**Edinson Geochemical Hydrocarbon Family Classification Maps**), but nothing similar was found. However, if any author can confirm that they have previously submitted a similar proposal that meets the indicators and/or requirements stipulated on page 1 of this article, we will recognize and accept the name and/or designation given to the methodology by that author.

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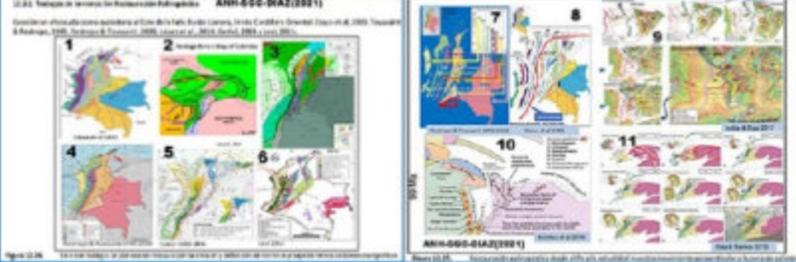
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