

# Discovery of the Giant Monte Alpi Field\*

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## Introduction

A relatively unknown and highly productive oil province in Europe was discovered by a British national oil company, all because they were told to stay close to home. A newly created international team at Enterprise Oil, unencumbered by operatorship, was able to piece together the seemingly complex geology of the Southern Apennines. The team also postulated a new, simpler geological model, playing a significant role in proving up the significance of the area as a major hydrocarbon producing province.

The British government created Enterprise Oil in 1983 when the oil producing assets located in the UK sector of the North Sea (controlled by then state-owned British Gas) were bundled up in this new company. Enterprise was floated on the London Stock Exchange in May 1984. The company's assets were, therefore, entirely in the UK. The newly created board decided they wanted Enterprise to develop into a geographically diversified E&P company and they set about creating a team to expand internationally. CEO Graham Hearne had a very clear idea of where the international team should and should not focus its efforts, and no amount of reasons why more distant prospects like West Africa might be a good bet would persuade him. "No," he said. "You can go anywhere in the world you like, provided that you can get there and back on the same day."

## Scouting Possibilities

That gave the team its parameters and they set about looking at the hydrocarbon provinces in western Europe other than the North Sea. The Paris Basin was one possibility, but another was Italy, where a number of small discoveries had been made in the Adriatic and nearby onshore. The Po Valley was completely closed to anyone other than Agip (now Eni) at that time.

The small international team – and it was small – began lengthy discussions over lunch with Fina and Total, who had offices in Milan and Rome, respectively. In 1985, Enterprise farmed into its first acreage in the Southern Apennine Mountains, taking interest from Fina and Total in the eastern trend acreage of Laurenzana and Torrente Sauro.

Meanwhile, Enterprise had a program of introducing itself to the larger operators active in the North Sea. One such operator was Agip, who had heard of Enterprise's interest in acquiring acreage in Italy. They took one look at this smallish upstart and suggested Enterprise deal with its 100-percent subsidiary Petrex, which was formed to pursue minor opportunities in Italy.

Thus began a long relationship with Carlo Viotti, who was at that time the exploration manager of Petrex. Discussions became even more extensive, and negotiations were very civilized with Franco Borromeo, the commercial manager of Petrex and a member of the great, historic Borromeo family.

The first Italian farm-in with the most significance for this story was in May 1987 when Enterprise took a 15-percent interest in the Monte Sirino permit and a 20-percent interest in the Monte Alpi permit in the Apennines from Petrex ([Figure 1](#)). Both permits were located within the northwest to southeast Apennines foothills trend where reverse-fault-bounded anticlines with Apulian platform carbonates (Upper Cretaceous-Miocene) reservoirs comprise the principal objective.

Enterprise postulated that the Apulian platform is probably largely in its depositional position, having been uplifted and faulted during late Pliocene and Quaternary compression (autochthonous model) and not, as was widely believed at the time, the product of long distance overthrusting (allochthonous model). The Lagonegro Triassic-Jurassic basinal sediments separated the Apulian platform from a smaller carbonate platform to the west. These were together thrust over the leading edge of the Apulian during the same compressive phase.

The Monte Alpi and Monte Sirino permits were located within two kilometers of the Caldarosa and Costa Molina oil discoveries. Agip drilled both discovery wells. Costa Molina, which was completed in 1983, flowed with 21-degree API oil from Apulian carbonates at a sustained rate of 500 bopd. The Caldarosa discovery well was completed toward the end of 1986. At that time there were rumors of significant flow rates and that the oil at 26-degrees API was significantly lighter than Costa Molina. The reservoir in both discoveries is at a depth of around 3750 meters, significantly deeper than the objectives in Monte Alpi and Monte Sirino.

Before agreeing to the farm-in, the team led by Chris Brown, Ivan Inchenko, and Jane Dyer carried-out a field exercise and were particularly interested in the old Tramutola field in the central part of the Monte Sirino permit, where oil was still seeping out of the ground. Oil and gas had been produced from fractured carbonates and shales in the field until production ceased after bombing in 1943. The reservoir is shallow (300-500 meters), and it is likely that the fractured and karstified carbonate is juxtaposed against deepwater shales and finely crystalline carbonates of the Lagonegro. The source was believed to be of Cenomanian-Turonian age.

### **Discovery and Development**

The first well was spudded on the Monte Alpi permit in late 1987 ([Figure 2](#)), and Enterprise opened its office in Rome in early 1988. It was on Good Friday that year, and Brown was just setting out for a long weekend of skiing in the Central Apennines with his family when he got a call from Rome to inform him that Monte Alpi-1 had flowed the equivalent of around 1000 bopd of light oil.

Carlo Viotti later joined Enterprise as the general manager of the Rome office. The following year, 1989, the Tempa Rossa-1 discovery was made in the adjacent Laurenzana permit where Enterprise had a 15-percent interest. This was a heavy-oil discovery, but it helped to build the picture of an exciting oil province and allowed the modeling of the distribution of API gravity.

By now, Enterprise had an understanding of the potential of the oil play in the Southern Apennines by bringing together the skills of geological fieldwork, geophysics with structural modeling, petrophysics, and geochemistry. These data were combined and led to the team putting forward in 1990 the concept of the “Giant Monte Alpi” field with potential reserves of 600 mmb recoverable ([Figure 3](#)). This was on the same scale as the North Sea Nelson discovery made by Enterprise two years earlier. On the back of this perceived potential, Enterprise increased its stake in the Monte Sirino permit to 35 percent that same year.

The pivotal year was 1991 when Monte Alpi-2 ([Figures 4 and 5](#)) was drilled to test the theory that Costa Molina-1 and Monte Alpi-1 were effectively the same structure with the same oil-water contact. Monte Alpi-2 penetrated a 1100-meter oil column in the Apulian carbonates with excellent vuggy porosity and found the said oil-water contact. The oil was light (about 40-degrees API) and the column was supported by fresh water believed to have originally fallen as rain on the outcropping Apulian carbonates some 150 kilometers to the east. Also that year, the Tempa Rossa-2 discovery was made in the neighboring Torrente Sauro permit where Enterprise had a 20-percent interest ([Figure 5](#)).

In 1992, Enterprise was able to increase its interests again in the Southern Apennines by acquiring the TransCanada Pipelines Limited share. As a result, the Enterprise interests became 40 percent in Monte Alpi and 55 percent in Monte Sirino. In that year, the Cerro Falcone-1 discovery was made in the Monte Sirino permit, and the two permits were converted into the Grumento Nova and the Volturino Concessions to allow appraisal and development operations. Agip (Eni) assumed operatorship. The appraisal drilling confirmed the presence of the giant Monte Alpi field as first suggested by Enterprise.

Production commenced in 1996. Up to the end of 2014, the complex of fields had produced 460 mmboe, according to IHS. Shell bought Enterprise Oil in 2002, and the complex of fields were unified by Eni and Shell to form the Val d’Agri field that currently produces about 85,000 bopd, also according to IHS.

In 2012, Total announced that it would proceed with the development of the Tempa Rossa field with first oil projected in 2016. Peak production will be 50,000 bopd from a field thought to contain some 400 mmb.

### **Concluding Note**

In 1985, Enterprise was pursuing a strategy of modest international exploration expansion but restricted by Graham Hearne’s instruction not to go further afield than a lunch engagement. Little did anyone realize that there was at least one billion barrels to be discovered onshore Europe and that Enterprise could obtain a significant chunk of that.

## **Authors**

Iain Paterson ([Figure 6A](#)) has more than 45 years of experience in the oil industry. After graduating from Cambridge and Durham universities, he began his career with BP as a geophysicist and served in Abu Dhabi, Iran, the United States and the United Kingdom. He joined Enterprise Oil in 1984 to create the team and to lead the international expansion of the company and became a main board director for international and exploration in 1992. After leaving Enterprise in 1998, he has followed a portfolio career, holding a number of posts as either chairman or non-executive director in both public and private companies, most of which have had a significant involvement in the energy business. These have included MOL Nyrt, Hunting, ITE Group, Paladin Resources and Sondex. He is currently a director of Enteq Upstream.

Chris Brown ([Figure 6B](#)) graduated with a master's from Imperial College in 1979 and has been a member of AAPG since 1980. His career has seen him working for Shell International, Enterprise Oil, Petro- Canada, and Aurelian. In 2011, Chris formed Silurian Consulting and has worked for a number of smaller companies. Chris is currently business development director for Beagle Geoscience and founder and chief technical officer for Blue Gate Energy.

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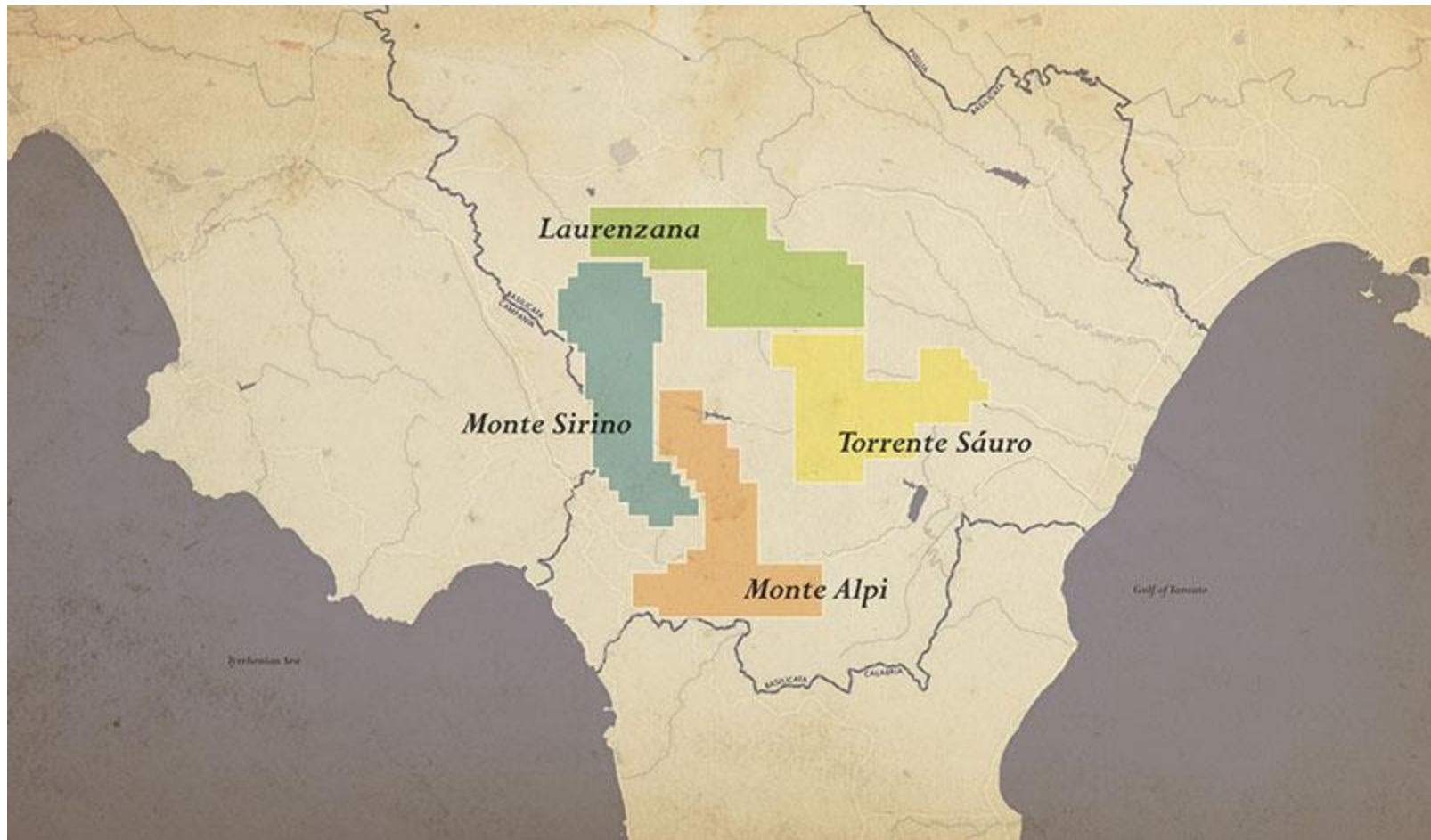


Figure 1. Location of Southern Apennines permits.





Figure 2. Southern Apennines well location.

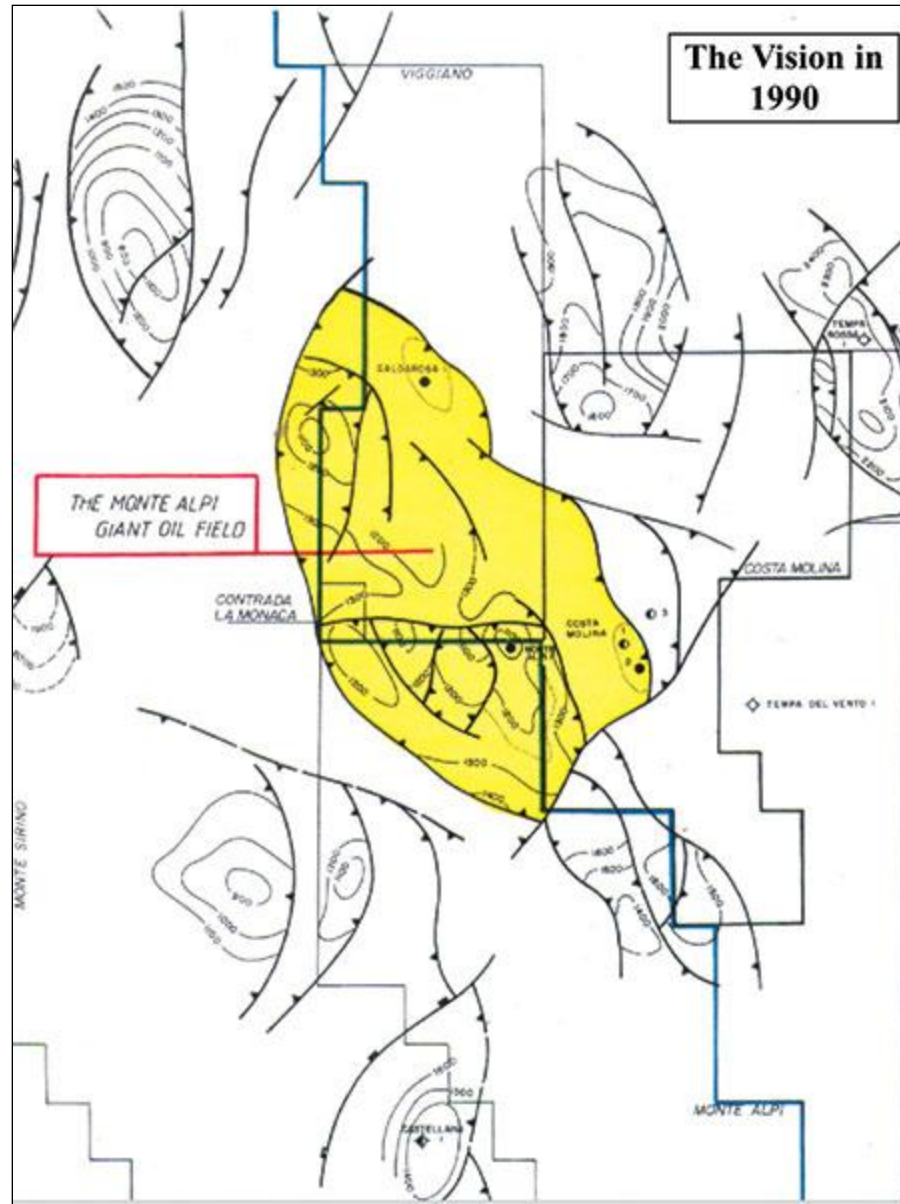


Figure 3. Monte Alpi giant oil field.

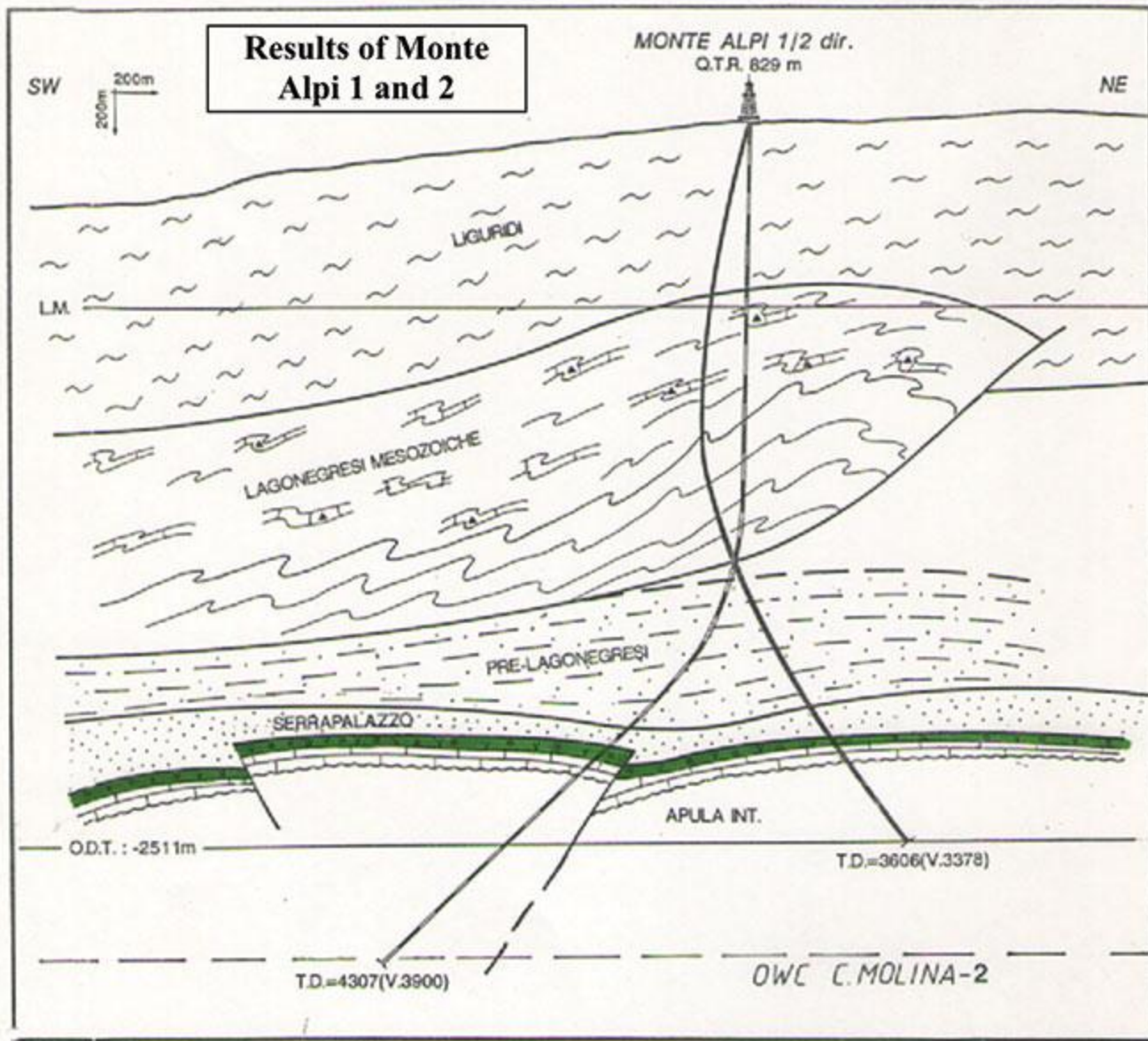


Figure 4. Monte Alpi section.



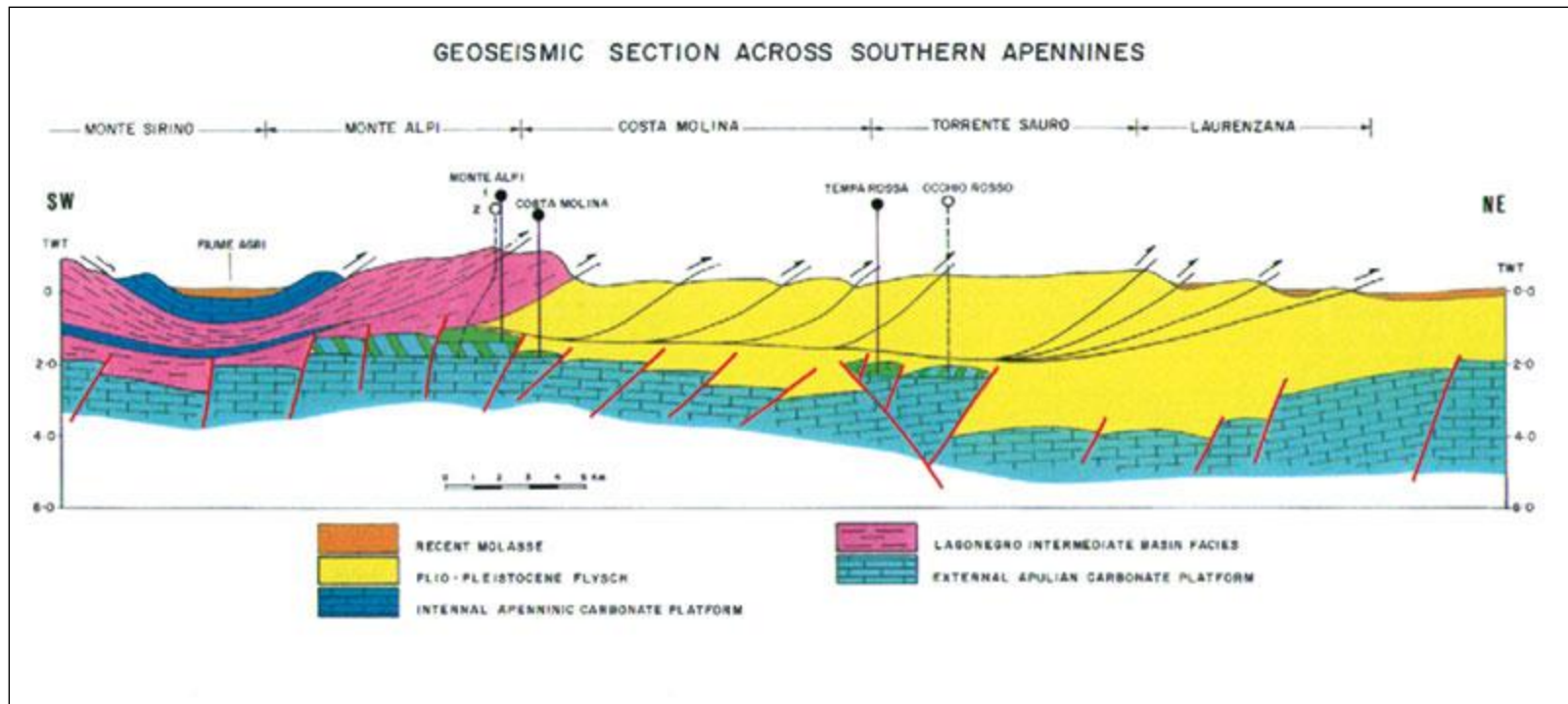


Figure 5. Geoseismic section across the Southern Apennines.



Figure 6. A. Iain Paterson. B. Chris Brown.