

Reclamation Cooperation Between the Netherlands and Japan from the Samurai Period. Thoughts Through Japan Water Disaster

Japan-Netherland reclamation engineering history

Kengo OKADA, Japan

1. Who?

1.1 Netherlands engineers

1.1.1 Anthonie Rouwenhorst Mulder

1.1.2 Cornelis Johannes van Doorn

1.1.3 Johannis de Rijke

1.1.4 George Arnold Escher

1.2 Japanese people

1.2.1 Denzaburo Fujita

1.2.2 Itsumu Takasaki

2. Engineering History

3. Thoughts through Japan water flood disaster

4. Friendship

SUMMARY

After the Meiji Restoration 1869 the Samurai era ended. Several Dutch engineers were invited by the New Japanese Government and came to Japan for cooperation in adopting Western infrastructure and reclamation and water management technology more than 140 years ago, in 1872. They worked together with Japanese ex-Samurai governer and private company, a young engineer for new Meiji era. Their plans are still affect our lives 140 years later. The technology has also helped and protected many people from recent Japanese flood disasters. We are thankful for old Dutch engineers and ex-Sumurai and wish to continue good cooperative relationship through their wonderful work. We wish continued success over next generation.

SUMMARY 武士時代からのオランダと日本との干拓歴史。近年の日本豪雨防災への貢献。

明治維新の後、サムライ時代鎖国は終わり、140年以上前の1872年西洋の技術を入れるべく数人のオランダ人が日本に来た。日本の近代土木砂防技術は日本人とともに働いた彼らによって生み出されたと言っても過言ではない。彼らのプランは、140年後の今も私たちの生活の下で生きている。また、その技術は近年の豪雨災害からたくさんの人を守るために影で支え、役立っている。私たちはオランダの技術に感謝をし、忘れることなくこの友好を後世に伝えて行きたい。

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1,Who?

1.1 Netherlands engineer

1.1.1 Anthonie Rouwenhorst Mulder



Anthonie Rouwenhorst Mulder

(28 April 1848-6 March 1901)

was a Dutch engineer and foreign advisor specializing in hydraulic engineering in Meiji period, Empire of Japan.

Mulder was born in Leiden, Kingdom of the Netherlands as the son of a tobacco trader. He obtained his degree as a civil engineer from what is now TU Delft in 1872.

After graduation, Mulder served as a supervisor of water management on the River Waal at Herwijnen. However, after only one year, he was invited by Prince Henry, the son of King William II to establish a trading post at the northern entrance to the Suez Canal, near Port Said in Egypt. Although his contemporaries advised against the venture, Mulder lived in Egypt from August 1873 to August 1876, and built the main house, a warehouse, a coal shed, a goods shed, service residences, two piers and the foundation for a water reservoir as well as a hotel. The trading post proved commercially successful, but the venture was terminated with the unexpected death of Prince Henry in 1876.

Mulder returned to the Netherlands, where he built the Change Canal in The Hague, as well as a steam-powered tramway in Haarlem.

Mulder was then recruited by the government of Japan in late 1879. He was responsible for improvements to the course of the Tone River, [1] Kinugawa River, Fuji River, Yodo River and the Sumida River; however, in Japan he became known as a specialist in the redesign and improvements of ports and harbours. In addition to the Port of Tokyo, where access had previously been hampered by large mudbanks, he also worked on ports in Okayama, Hiroshima, Hachinohe and Shimonoseki. His contemporaries in Japan included Cornelis Johannes van Doorn, Johannis de Rijke and George Arnold Escher.

After his contract expired in 1890, he returned to the Hague. In 1897 he returned to the Netherlands and designed a system of steam-powered tram lines in Nijmegen. He died in Nijmegen in 1901.

1.1.2 Cornelis Johannes van Doorn

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Cornelis Johannes van Doorn

5 January 1837 – 24 February 1906)

was a Dutch civil engineer and foreign advisor to Meiji period in Japan.

Biography

Cornelis Johannes van Doorn was born on 5 January 1837 in Hall (Gelderland), Netherlands, the son of the Reverend PW van Doorn. Van Doorn studied at the Technical School of Dr. Grothe in Utrecht and then at the Royal Academy in Delft. He received his degree in 1860 as a civil engineer. In his early career he went to Java in the Dutch East Indies, returning home in 1863 to work for the Maatschappij tot Exploitatie van Staatsspoorwegen railway company in North Holland.

From March 1865 he worked as an engineer in designing the locks, pumping station and dam on the IJ (Amsterdam). In 1871 Van Doorn was invited by the Japanese government to act as an expert in hydraulic engineering, arriving in Japan on 24 March 1872 and staying to 22 July 1880. During his time in Japan he was involved in port development and river improvement projects on the Edo River, Osaka, Yokohama, and Nobiru in Sendai Bay. He designed Japan's first western-style waterway, the Asaka Canal, which reclaimed land for 52 kilometers around Lake Inawashiro in Fukushima Prefecture and made the development of the city of Kōriyama possible.

A memorial bronze statue was erected to him beside the sluice gate on the Tone River in 1931.^[4] He also designed Japan's first western-style lock, the Ishii lock in Ishinomaki, designated an Important Cultural Property in 2002. Returning to the Netherlands after eight years, Van Doorn died in Amsterdam in 1906.^[1] In the Netherlands, not much is known about his efforts in Japan. In Japan, on the other hand his name is found in schoolbooks, there are museums dedicated to him and streets and squares named after them. Even Van Doorn's grave in Amsterdam is maintained at the expense of Japanese city of Kōriyama.

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1.1.3 Johannis de Rijke



Johannis de Rijke

(December 5, 1842 – January 20, 1913) was a Dutch civil engineer and a foreign advisor to the Japanese government in Meiji period in Japan.^[1]

In September 1873 De Rijke arrived in Japan together with Van Doorn and George Arnold Escher. During the next thirty years these three civil engineers developed a range of flood control and water management projects.^[5] He improved the ports of Tokyo, Yokohama, Nagasaki, Ujina (Hiroshima), Hakata (Fukuoka), Mikuni (Sakai) and Niigata. His breakwater at the port of Yokkaichi is recognized by the Japanese government as an Important Cultural Property.

De Rijke also developed plans to improve riparian zones of several Japanese rivers. Notably, his groundwork and planning caused separation of the Kiso River, Nagara River and Ibi River near Nagoya, also known as the Kiso Three Rivers. Importantly, After 1891 De Rijke was appointed an Imperial officer of the Meiji Home Ministry where he rose to the position of Vice Minister in this Japanese government bureaucracy. He later served as an instructor in the Imperial College of Engineering.

1.1.4 George Arnold Escher



George Arnold Escher

Esch George Arnold Escher (10 May 1843 – 14 June 1939) was a Dutch civil engineer and a foreign advisor to the Japanese government during the Meiji period.

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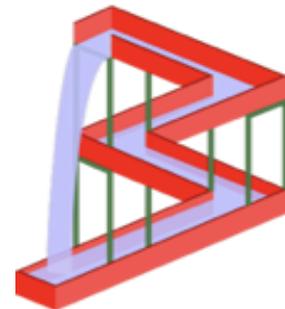
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He was the father of the graphic artist M. C. Escher and the geologist Berend George Escher.

Escher was hired by the Japanese government as a foreign advisor from September 1873 to July 1878, along with fellow Dutch civil engineers Johannis de Rijke and Cornelis Johannes van Doorn. During his stay in Japan, he designed and supervised the restoration of the Yodo river (Osaka), and built a harbour in Mikuni in Fukui prefecture.

After returning to the Netherlands, he worked in Maastricht. During this time, he recorded in his diary his difficulty as a Protestant in finding a suitable marriage partner in Roman Catholic Maastricht who would also be able to satisfy his equation $v = 1/2m + 10$, where v was the age of the woman, and m the age of the husband. In 1882, Escher married Charlotte Marie Hartitzsch, with whom he had two sons. He became a widower in 1885 and worked as a hydraulic engineer in Leeuwarden. In 1892 he married Sara Gleichman, with whom he had three more sons. In 1903 the family moved to Arnhem.

Son :M. C. Escher



Maurits Cornelis Escher

(Dutch pronunciation: [ˈmɑʊrɪts kərˈnɛːlɪs ˈɛʃər]; 17 June 1898 – 27 March 1972) was a Dutch graphic artist who made mathematically-inspired woodcuts, lithographs, and mezzotints.

Despite wide popular interest, Escher was for long somewhat neglected in the art world, even in his native Netherlands. He was 70 before a retrospective exhibition was held. In the twenty-first century, he became more widely appreciated, with exhibitions across the world.

His work features mathematical objects and operations including impossible objects, explorations of infinity, reflection, symmetry, perspective, truncated and stellated polyhedra, hyperbolic geometry, and tessellations. Although Escher believed he had no mathematical ability, he interacted with the mathematicians George Pólya, Roger Penrose, Harold Coxeter and crystallographer Friedrich Haag, and conducted his own research into tessellation.

Early in his career, he drew inspiration from nature, making studies of insects, landscapes, and plants such as lichens, all of which he used as details in his artworks. He traveled in Italy and Spain, sketching buildings, townscapes, architecture and the tilings of the Alhambra and the Mezquita of Cordoba, and became steadily more interested in their mathematical structure.

Escher's art became well known among scientists and mathematicians, and in popular culture, especially after it was featured by Martin Gardner in his April 1966 *Mathematical Games*

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column in *Scientific American*. Apart from being used in a variety of technical papers, his work has appeared on the covers of many books and albums. He was one of the major inspirations of Douglas Hofstadter's Pulitzer Prize-winning 1979 book *Gödel, Escher, Bach*.

TU Delft University Engineer list Doorn, Escrer, Mulder

現デルフト工科大学出身者

氏名	在学期間	関連事項 ()内は日本の資格
C. J. Van Doorn	1855 ~ 1860	Gew. Hoofd-Ing in Japan (長工師)
G. A. Escrer	1859 ~ 1863	Hoofd-Ing V/d Waterstaat (1等工師)
A. F. L. Rouwenhorst Mulder	1867 ~ 1872	Gew. Hoofd-Ing Openbare Werken in Japan (1等工師)
A. E. Lindo	1867 ~ 1870	Exploitatie S. S. in N. I. (2等工師)
A. H. T. K. Thissen	1863 ~ 1870	Civiel-Ingenieur (3等工師)
H. J. VERHELLOUW [GESCHIEDENIS VAN HET DELFTSCH STUDENTENNCORPS]1898年より作成		



1.2 Japanese people

1.2.1 Denzaburo Fujita



Baron Denzaburo Fujita (1841-1912)

Born in Yamaguchi. Businessman. His father was a brewer. At the end of the Tokugawa period, he joined the Choshu feudal clan's exclusion movement, rushing to the national affairs and joining the odd soldiers. After the Meiji Restoration, he moved to Osaka and started manufacturing military shoes in 1869, becoming an army supplier. He gained profit in the final samurai war (satsuma rebellion 1877) and founded Fujita Gumi (company) in 1881. In 1884, the company expanded its business after receiving the government-run Kosaka Mine's payment and started various businesses mainly in the mining industry. He also participated in the founding of Osaka Textile and Osaka Sakai Railway, and became the head of the Kansai Business World, including being head of the Osaka Chamber of Commerce. Baron in 1911.

Kojima Bay Reclamation Project

Of particular note is the reclamation project at Kojima Bay. This plan dates back to the days of the Okayama clan, and was partially begun. In the Meiji era the old clans tried to proceed but they relied on Fujita due to financial difficulties. Although he had no prospects for profits he dreamed and took on a large-scale national land creation plan. This area is a scale that

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exceeds the public opinion of government and commerce.

The reclamation project was applied for in 1894 and approved 5 years later in 1889. However, local opposition, a recession, and a flood occurred (1899). The vast sea of 5,500 town steps in total was reclaimed in seven wards, and the first five wards were completed by Fujita Gumi alone in 1950 and completed in 1950. The sixth ward was handled by the Fujita Gumi, the Ministry of Agriculture and Forestry, and the Agricultural Land Development Corporation, and the whole was completed in 1963, which took 65 years since the start of construction. As a result villages built on reclaimed land centered on District 2 were named after Fujita. This remains as a district name even after the village was later merged with Okayama City. Therefore, in Okayama city area, Densaburo Fujita is often taught in the local history of elementary school classes as “the person who made up Fujita village” In all respects, he is recognized as a great man who died in the area.

1.2.2 Itsumu Takasaki



Baron Itsumu Takasaki

(April 4, 1836 -May 6, 1896 (Meiji 29)) is the late Satsuma feudal lord of the Edo era, Meiji. The bureaucrat of the era, Kincho Koma. The rank is baron. Called the pseudonym Inoro or the Hyobu, and Nickname “**Friendship**”.

The Seto Inland Sea coast of Okayama Prefecture had a wide range of tides and wide tidal flats making it suitable for reclamation. The cultivated land was expanded by gradually reclaiming the tidal flats, and a large-scale reclaimed land was born around Kojima Bay in the Edo period.

After the Meiji Restoration, Okayama Prefectural Order, Itsumu Takasaki, submitted a large-scale reclamation of Kojima Bay to the government as a measure against the birth of the samurai, and sought opinion from the Dutch Ministry of Interior, Mr. Murder. In 1881 (Meiji 14), a resurrection letter submitted by the Mulder to the Ministry of Interior based on a field survey planned to reclaim about 5,200 hectares from Districts 1 to 8. Takasaki requested that the Kojima Bay reclamation be implemented as a government project and requested the government pay for the huge amount of funding required for the construction but it was not permitted.

Therefore, reclamation was inevitably converted to private development, and contracted by Choza's politician, Densaburo Fujita. Although development permission was granted to Fujita Gumi in 1889 (Meiji 22) opposition was forced to postpone due to problems such as irrigation and drainage problems and fisheries compensation with construction only beginning in 1899 (Meiji 32). Based on Murder's plan, Fujitsu Gumi's advisory engineer, Ajiro Kasai, completed the first ward in 1905 and completed the second ward by 1912 (Meiji 45). Thereafter, the third and fifth wards and the sixth ward were reclaimed by Fujita Gumi, and after the war the seventh ward was reclaimed by the Ministry of Agriculture and Forestry. Districts 4 and 8 have been suspended for technical and economic reasons.

My Research start from→

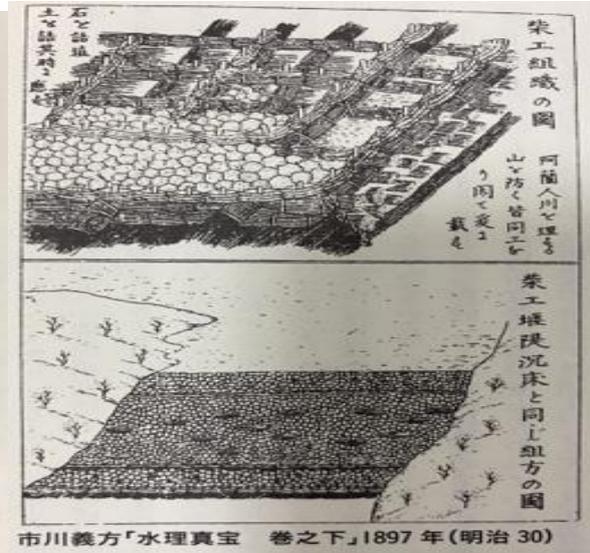
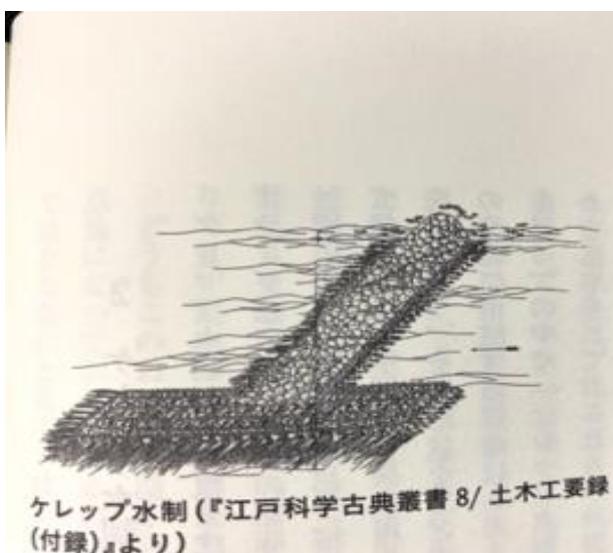


Okayama Meisei Gakuin
High School
Local Sociology research club
<http://www.meiseigakuin.ac.jp>

Okayama prefectural Kojima Afsluitdijk office and Library.



2. Engineering History



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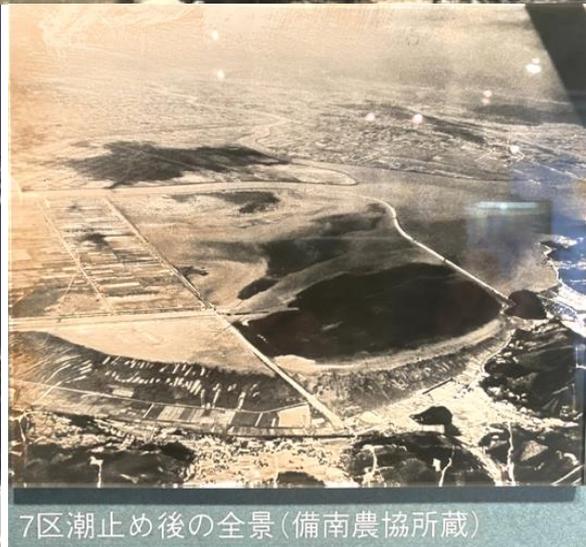
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旭川のケレップ水制



捨石角落としにより築堤



7区潮止め後の全景(備南農協所蔵)

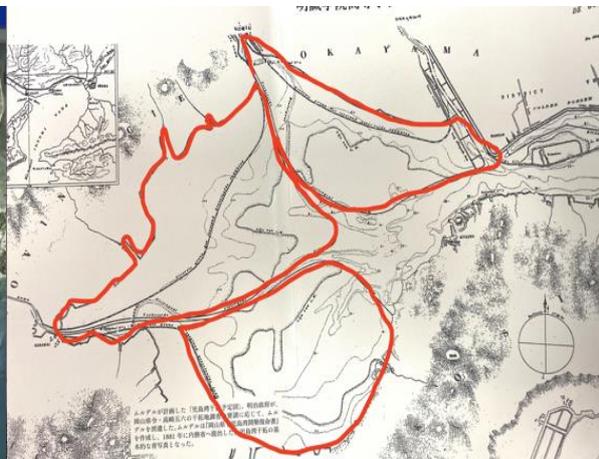
Kojima Okayama Reclamation Land now and then 1892 by Mulder plan

2020

空からみた児島湾干拓地



1982 Mulder Plan



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3. Thoughts through Japan water flood disaster



2018 okayama disaster

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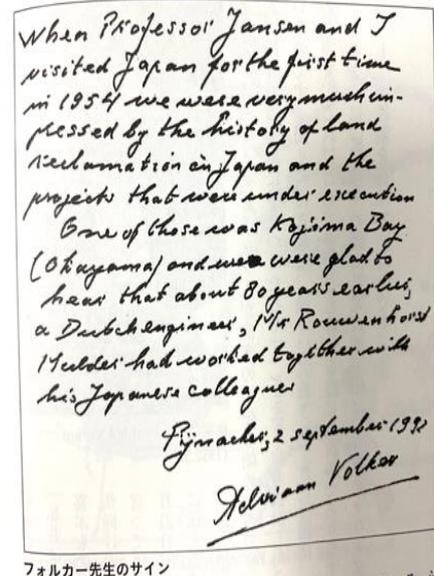
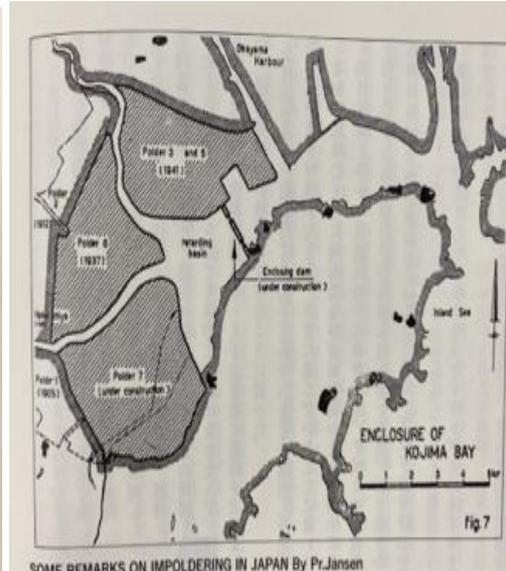
Protect! Okayama 0.6 million citizen from 2018 Flood disste 2019 Around Tokyo area

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4. Friendship

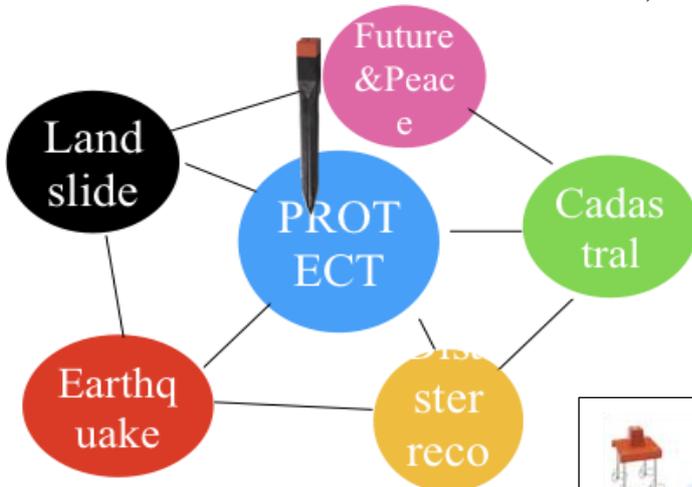
1952 TU Delft University Professor Pieter Philip Jansen, Adrian Volker visit Kojima Okayama Reclamation Land. They start again Netherlands and Japan friendship after WWII. We have had good friendship through Reclamation land and Mulder technology, over the war and peace.



+RIPRO Information:

PROTECT

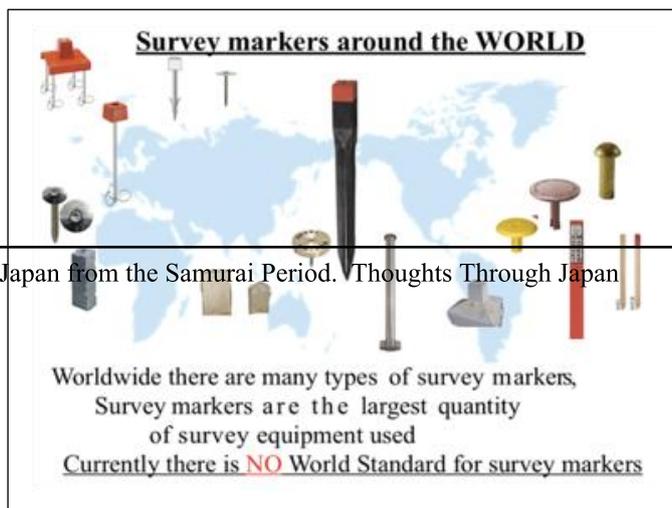
Markers protect us by marking our boundaries, monitoring earthquake, recovering disaster, landslide, etc



Landslide Protection system

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(Terrain interpretation by aerial photographs and satellite images, risk classification, disaster situation grasp, risk map creation)



Sensor Ecostakes Idea!



Thank you very much Netherlands!

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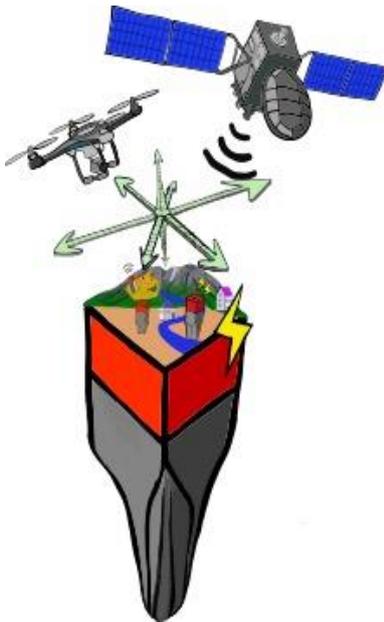
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