

Dr. Tanja Stratmann (Tiefseeökologin)

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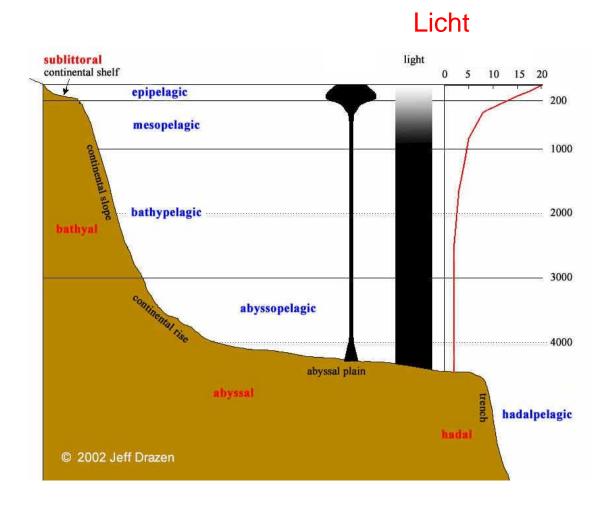


- Hoher Druck





- Hoher Druck
- Dunkelheit



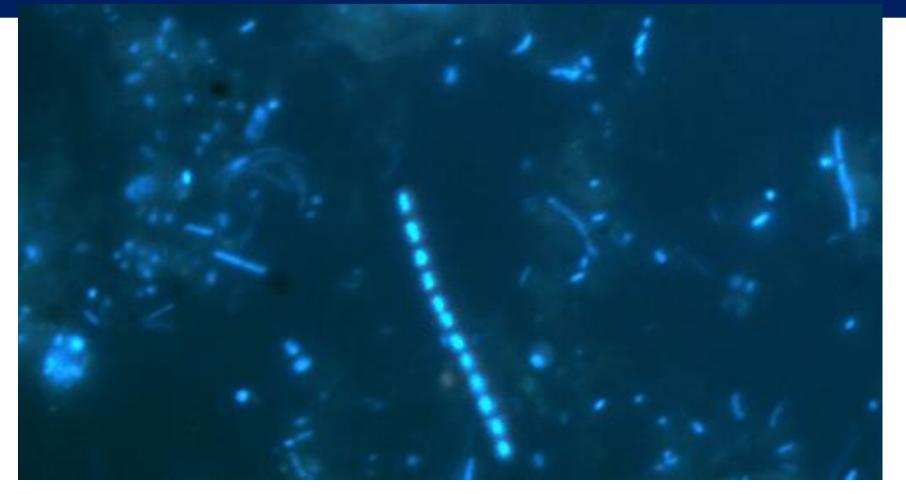
- Hoher Druck
- Dunkelheit
- Kälte (ca. 2°C)



- Hoher Druck
- Dunkelheit
- Kälte (ca. 2°C)
- Stark reduzierte Nahrungszufuhr

in Pg C (1 Pg = 1 Gt = 10^{15} g) **Euphotic** 50-100 m zone 50 Produced 10 Exported Ocean 3-5 km Interior 2 Deposited Sediments 0.2 Buried 10-30 cm

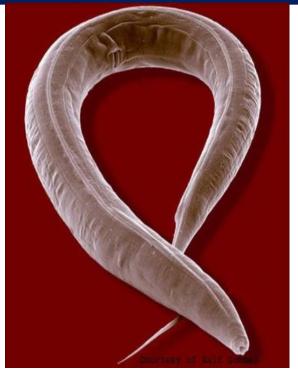
4% der Primärproduktion des Oberflächenwassers



Zellengröße: einige Mikrometer (0.0001 mm)

Mikroorganismen: 10 – 100 Mio Zellen/ cm³



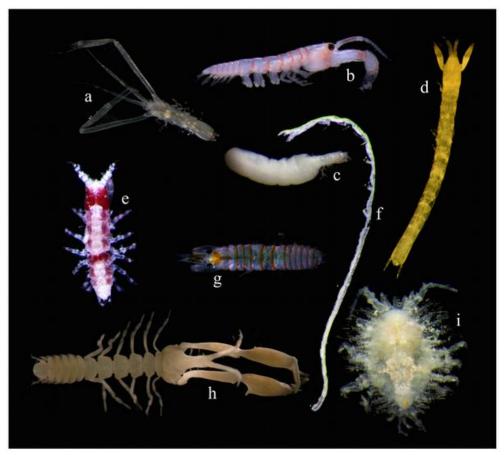




Tiergröße: 0.032 – 0.5 mm

Meiofauna: 1 Mio Tiere/ m²

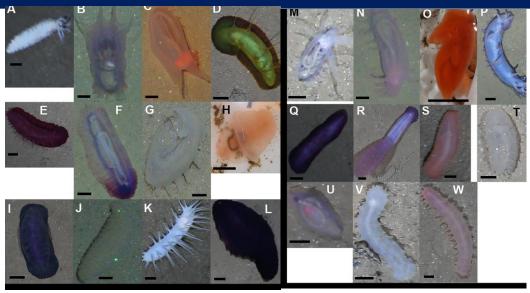




Makrofauna: 1.000 Tiere/ m²

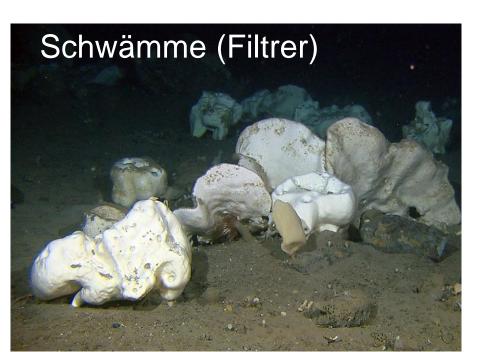
Tiergröße: >0.5 mm





Megafauna:

<1 Tier/ m²



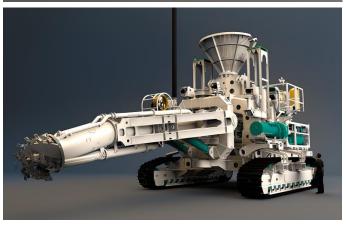


Tiergröße: >1 cm

Der Konflikt – Tiefseebergbau







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75 KWh Batterie braucht

- 56 kg Nickel
- 12 kg Mangan
- 7 kg Kobalt
- 85 kg Kupfer

Tiefseebergbau – die Ressourcen

Kobaltreiche Eisenmangankrusten



Massivsulfide am Meeresboden

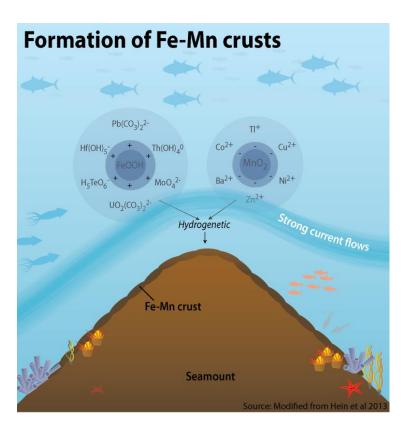


Manganknollen



Tiefseebergbau – Ressourcenvorkommen Polymetallic nodules Cobalt-rich crusts Polymetallic sulphides / vents Exclusive economic zones 150°0'0"W 140°0'0"W Clarion Clipperton Solwara 1 Pacific Ocean Ocean Clarion-Clipperton Fracture Zone Exploration Areas for Polymetallic Nodules Federal Institute for Geosciences and Natural Resources of the Federal Republic of Germany (BGR; Germany) Cook Islands Investment Corporation (CIIC; Cook Islands) Marawa Reseach and Exploration Ltd (Kiribati) Interoceanmetal Joint Organization (IOM; Bulgaria, Cuba, Czech Republic, Poland, Russian Federation and Slovakia)

Kobaltreiche Eisenmangankrusten

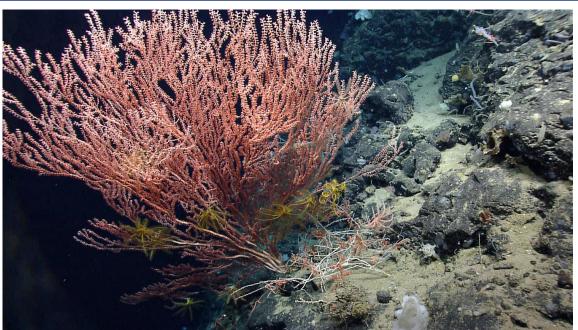


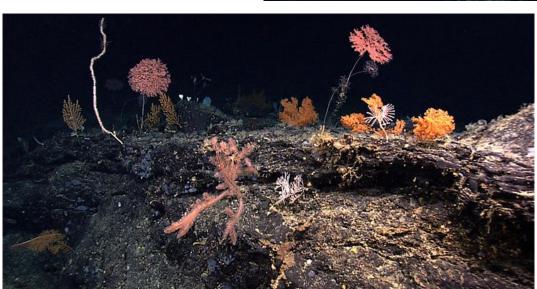




Kobaltreiche Eisenmangankrusten

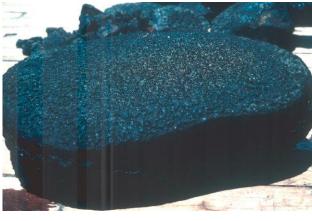




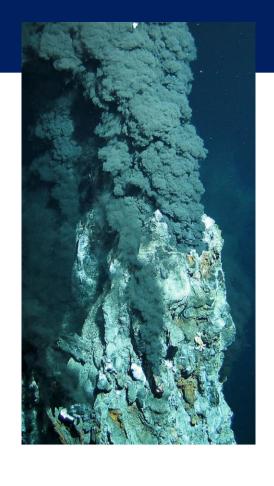




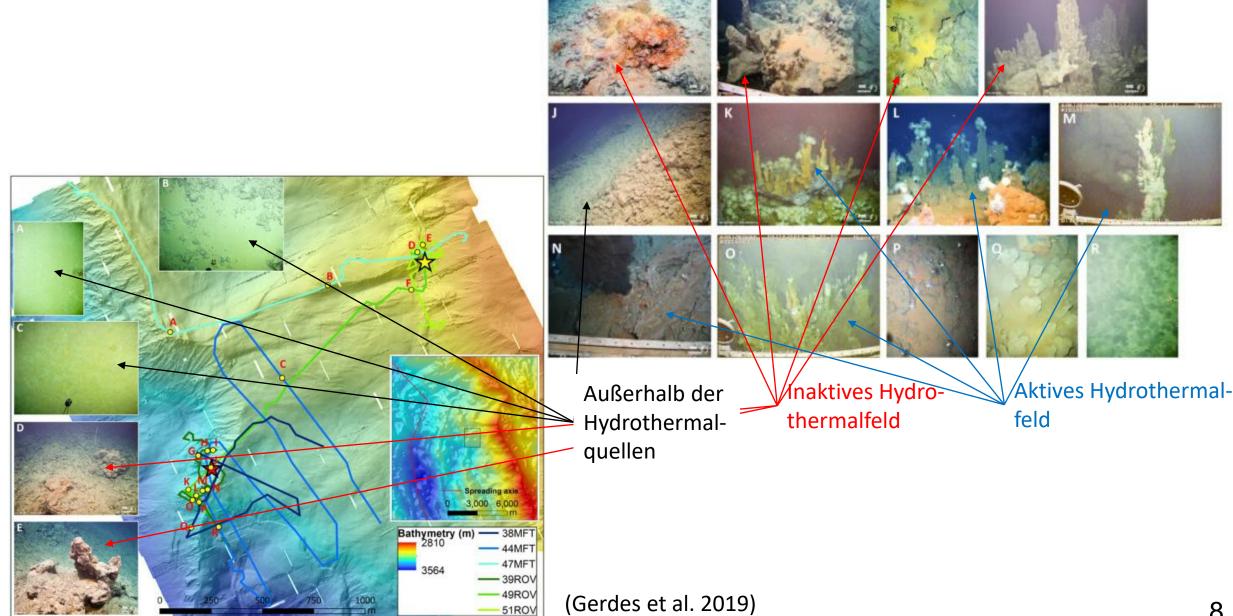




Massivsulfide am Meeresboden

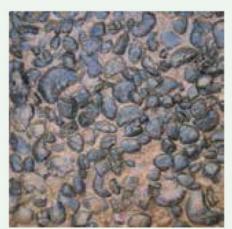


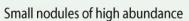
Massivsulfide am Meeresboden



Manganknollen

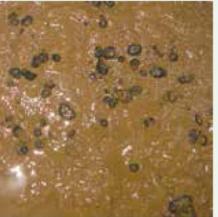
Variability in nodule abundance within the Clarion-Clipperton Zone







Large nodules of high abundance



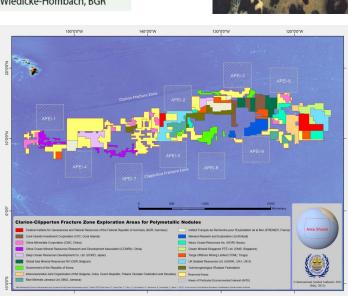
Small nodules of low abundance



Bi-modal nodules of high abundance

Photo: Micheal Wiedicke-Hombach, BGR

→ 34 Milliarden t Manganknollen (7,500 Mio t Mangan, 340 Mio t Nickel, 256 Mio t Kupfer, 78 Mio t Kobalt) kommen in der CCZ vor



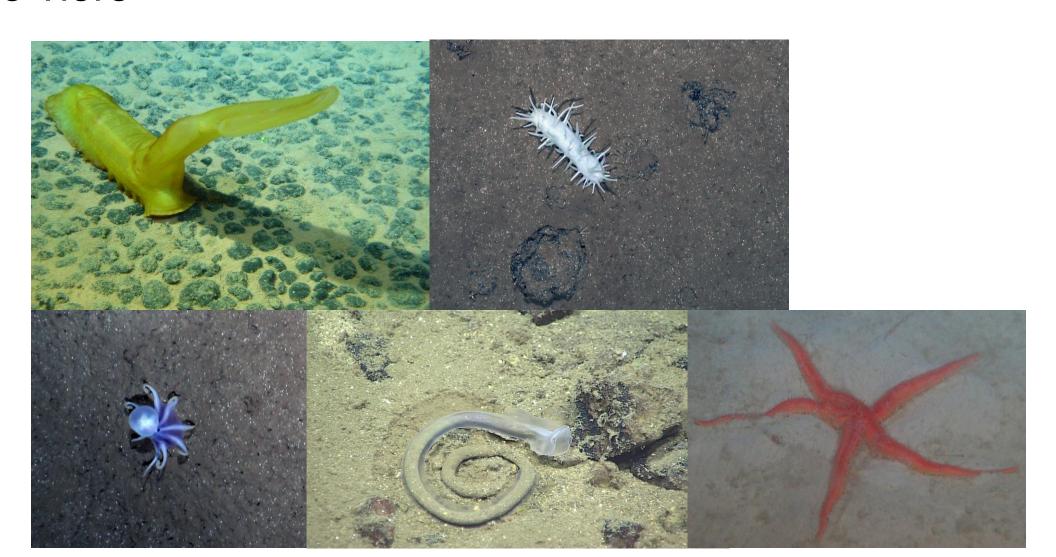
Manganknollen

Fest sitzende Tiere

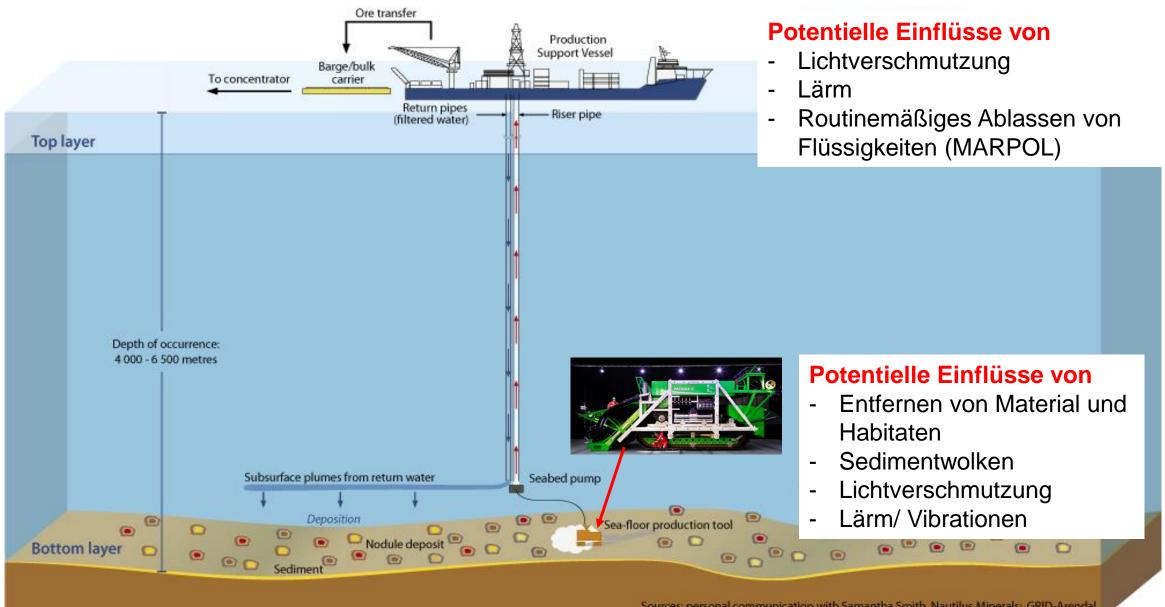


Manganknollen

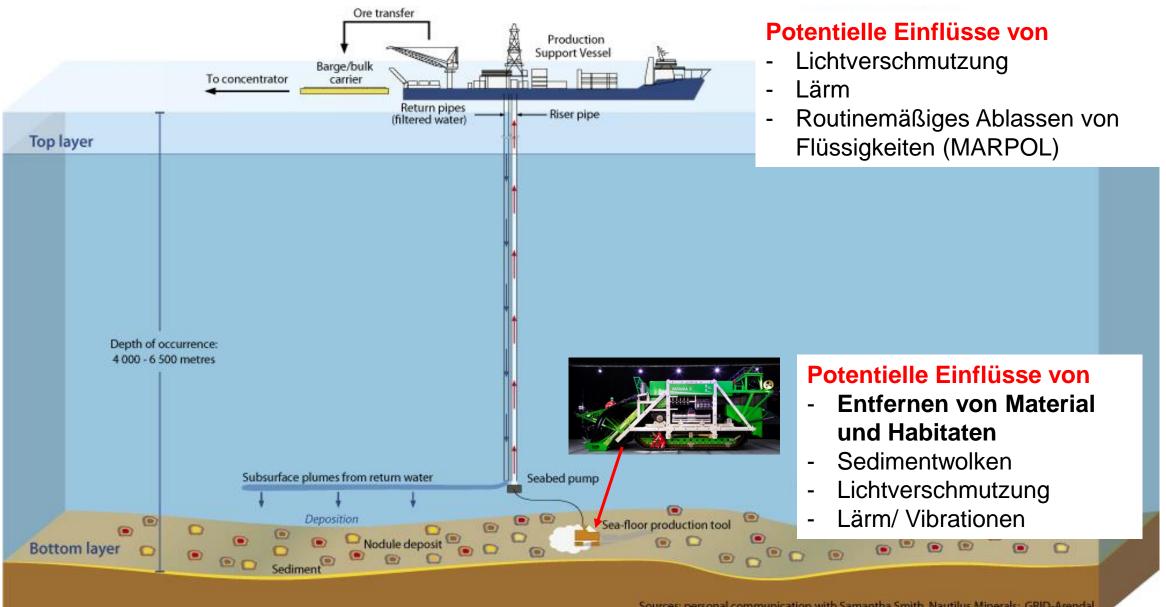
Mobile Tiere



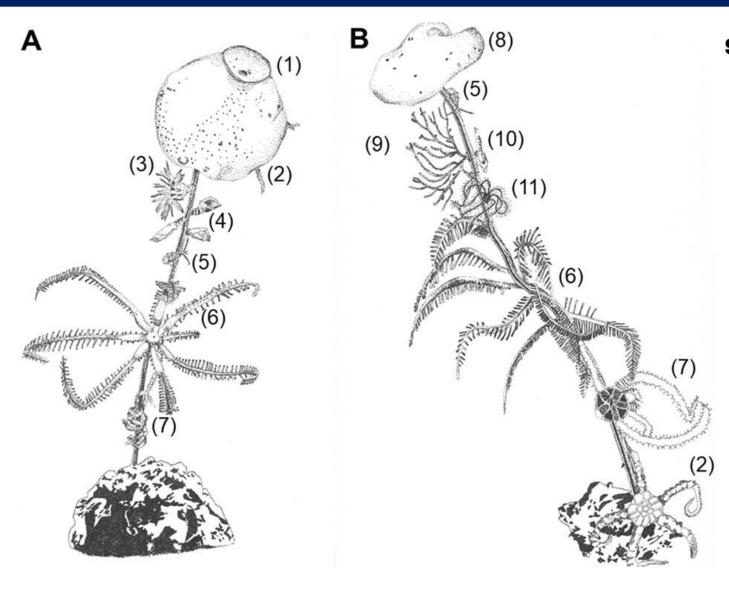
Auswirkungen von Tiefseebergbau auf das Ökosystem



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scientific reports

PFN

Polymetallic nodules are essential for food-web integrity of a prospective deep-seabed mining area in Pacific abyssal plains

Tanja Stratmann^{1,2,312}, Karline Soetaert¹, Daniel Kersken^{4,5} & Dick van Oevelen¹

- → Entfernen von Manganknollen führt zu:
- Verlust von ca. 20% der Tiergruppen
- Verlust von 20 30% der Verbindungen zwischen den Gruppen