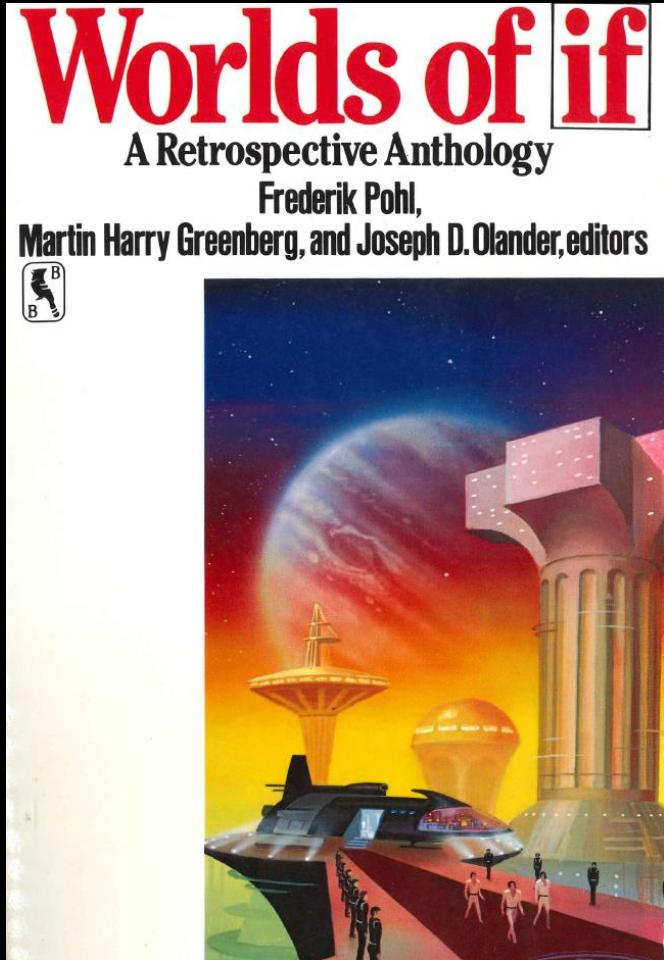


# Science fiction til science fakta

Real undervisning UiO, høst 2022

*Tone Gadmar & Heidi Konestabo, Realfagsbiblioteket*

*«... Thank heaven for little nerds  
For little nerds get bigger every day...»*  
(fritt parafrasert etter Lerner/Loewe/Chevalier, 1957)



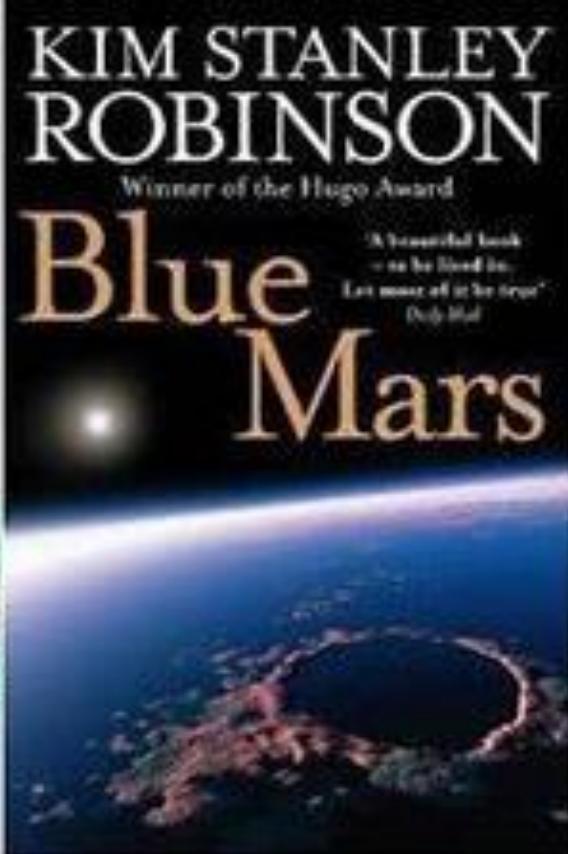
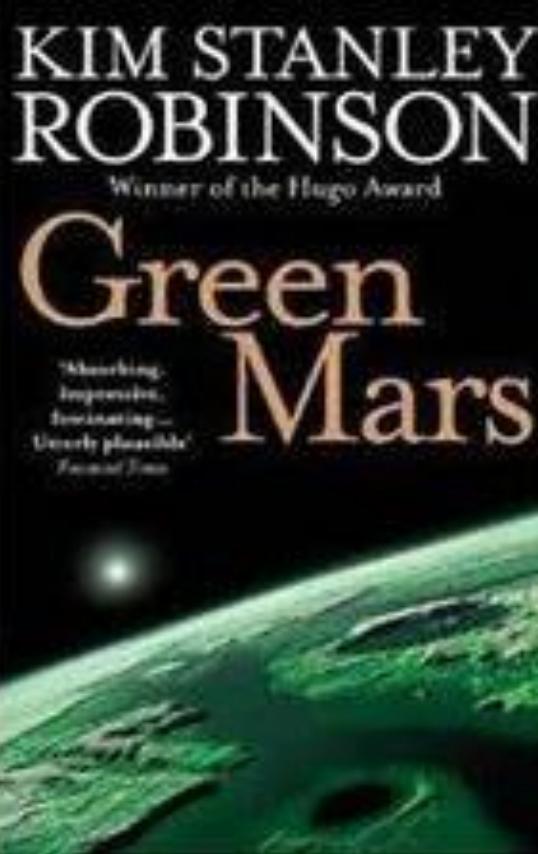
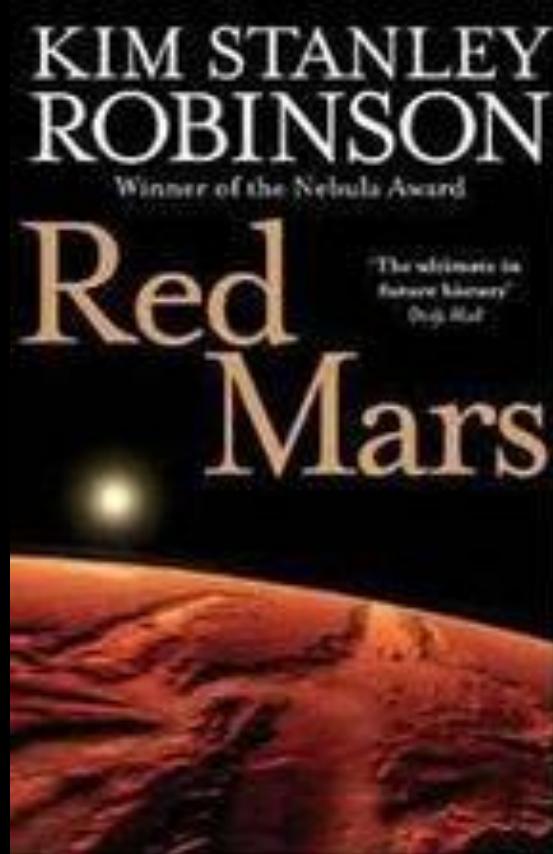
ill., StanleyStella, T-shirt

# Hvorfor Science fiction?

1. Det umuliges mulighet
2. Modellenes verden
3. Engasjement og kreativitet

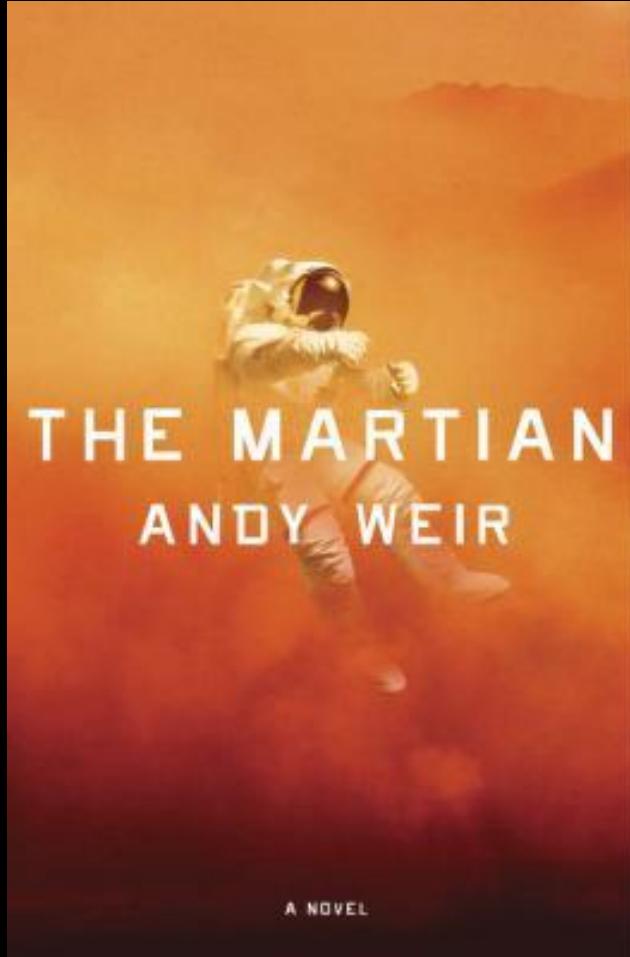
# *'The Mars trilogy'*

*Kim Stanley Robinson, 1992 - 1996*



# *'The Martian'*

*Andy Weir, 2014, (film 2015 regi Ridley Scott)*



*"If the **oxygenator** breaks down,  
I'll suffocate.*

*If the **water reclaimer** breaks down, I'll  
die of thirst.*

*If the **Hab** breaches,  
I'll just kind of implode.*

*If none of those things happen,  
I'll eventually run out of **food** and starve  
to death."*

*(Mark Watney, fictional astronaut)*

# Science the shit out of this



# BIO2020 Biologiske metoder

- Metodekurs, bachelor biovitenskap
- Forskningsintegrert undervisning
- Miljø, bærekraft og sirkulær økonomi

[Video](#)







# Andre steder vi har vært

- IN3010 – Transformativt design
- Skolebesøk VGS & ungdomsskole
- Arendalsuka
- The Gathering
- +++

# *'The word for world is forest'*

*Ursula K. LeGuin, 1972*

- Livet har «**terraformet**» jordas atmosfære før
  - Ca. 2,5 milliard år siden
  - «Oksygenkatastrofen»
- 
- $MH_4 \rightarrow CO_2 \rightarrow O_2$
- 
- Denne terraformingen tok 300-400 mill. år



Foto ill. Hellyer Gorge,Tasmania

Mulighet for liv på andre kloder:

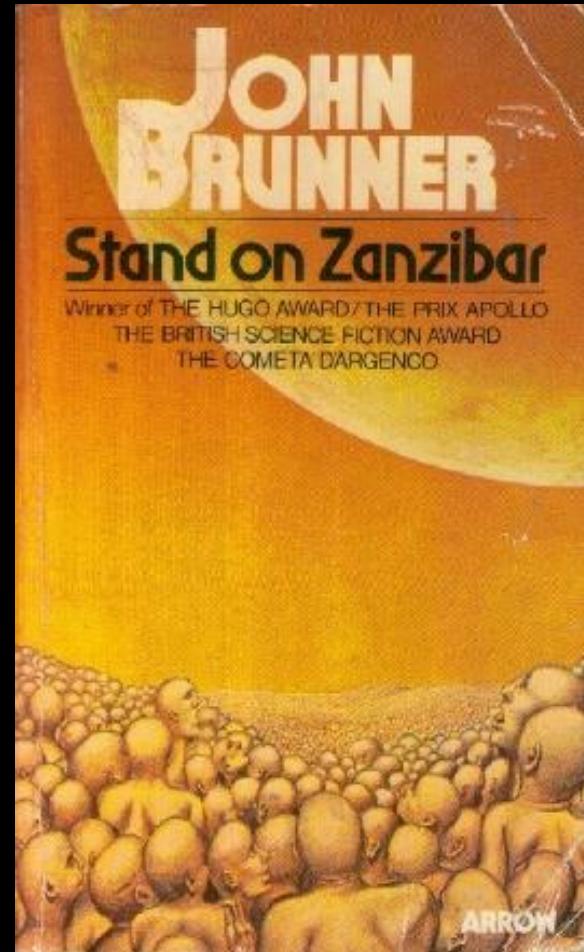
Oksygen-atmosfærer vokser da ikke på trær - eller gjør de?

# *'Stand on Zanzibar'*

*John Brunner, 1968*

Hvor mange er vi egentlig?

- 1968 – 3,5 mrd.
  - 2010 – 7,0 mrd.
  - 2019 – 7,7 mrd.
  - 2100 – ca. 12 mrd.
- 
- 4 pers pr kvadratmeter  
«standing on Zanzibar»



# *'Make room! Make room!'*

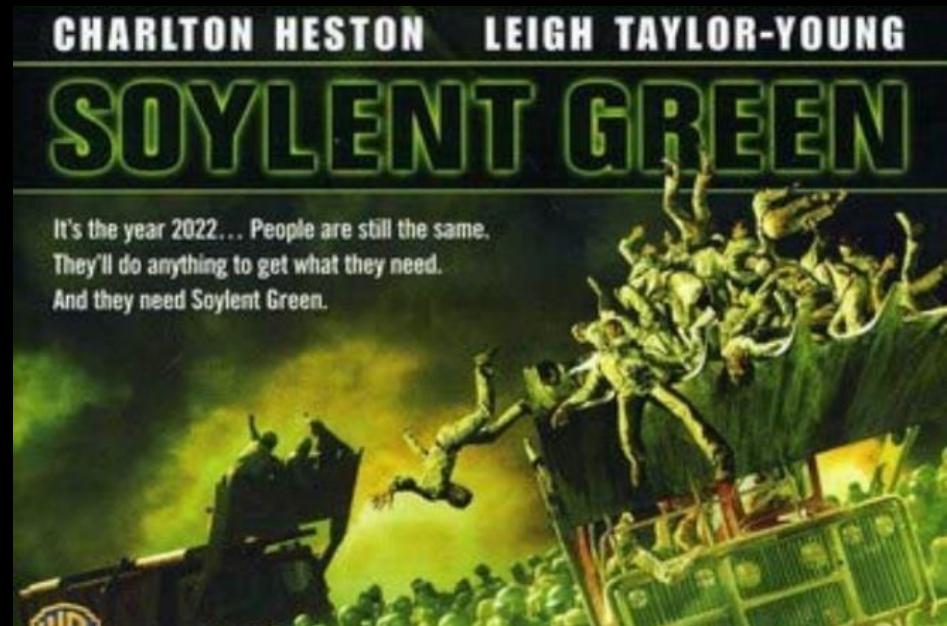
*Harry Harrison, 1966 (film 'Soylent green' 1973)*

*1 acre feeds 1 person*

$1 \text{ acre} \approx 4 \text{ mål}$

**Hva får man av 1 mål?**

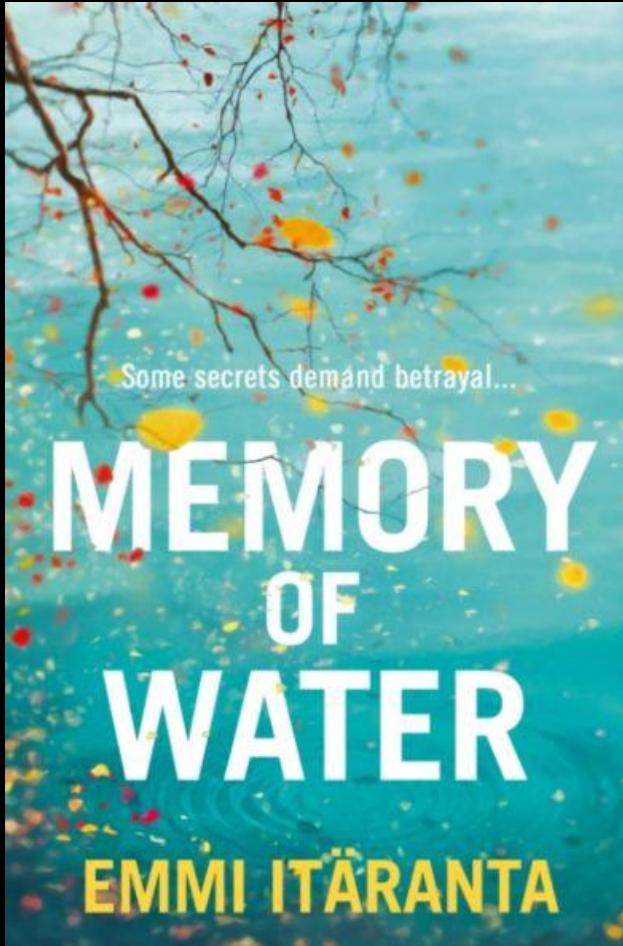
- 3000 kg potet
- 300 – 400 kg korn
- $\approx 350$  kg  
erter/bønner
- 8 – 10 høner
- $\frac{1}{2}$  geit eller sau



forskning.no, bioforsk.no, frukt.no,  
gardsbruk.no, felleskjøpet.no

# *'Memory of water'*

*Emmi Itäranta, 2014*



**Vannstress – Day Zero:**  
Cape Town, São Paulo,  
Bangalore, Beijing, Cairo, Jakarta,  
Moskva, Istanbul, Mexico City,  
London, Tokyo, Miami, Perth ...



BBC + lokal by-statistikk

Foto ill. Victoria, Australia, Flagstaffotos

# *'Bienes historie'*

Maja Lunde, 2015



**Noe har vi igjen:** Mais, ris, hvete, havre, durra, soyabønner, poteter, sopp – men det blir litt kjedelig i lengden ...

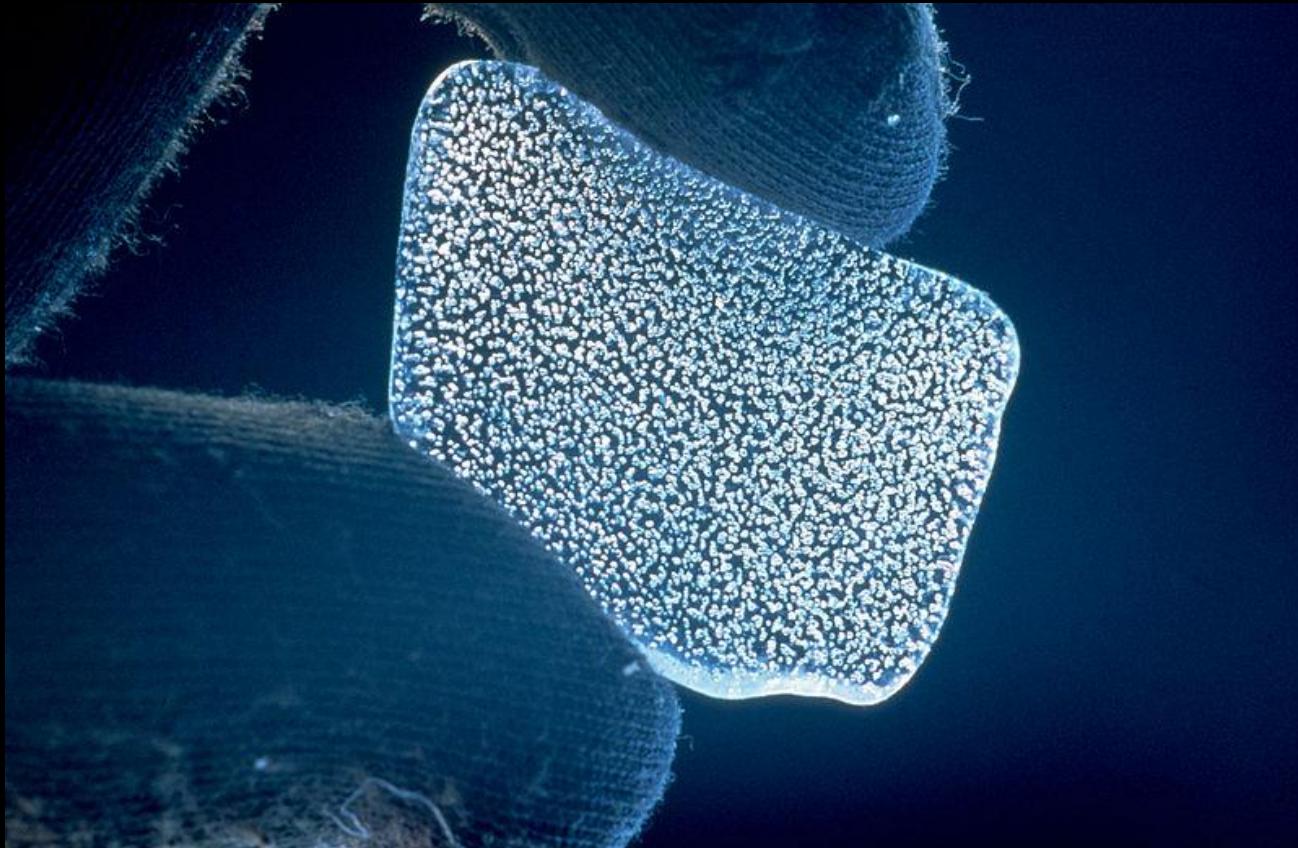
**Vi mister mye:**  
Frukt  
Bær  
Grønnsaker  
Noe nøtter

70% av verdens  
100 viktigste  
mat-planter  
trenger bier

Foto illustrasjon:  
Dagbladet; Kiwi

# 'Antarctica'

*Kim Stanley Robinson, 1997*



"Air bubbles trapped in ice hundreds or even thousands of years ago are providing vital information about past levels of greenhouse gases in the Earth's atmosphere" (**CSIRO 2000**)

*«All of this has happened before, and it will all happen again»*  
*(Originalt sitat J.M. Barrie , ‘Peter Pan’ 1906)*



The Road,  
C.McCarthy  
2006



‘Hunger  
Games’,  
S. Collins  
2008



#KunneVærtMeg

‘The  
Handmaids Tale’  
M. Atwood  
1985



«All of this has happened before, and it will all happen again»  
(Re-sitert i Battlestar Galactica 2004)



- Gliese 876 → 15 lysår
- Raskeste rom-fartøy  
0,6% lyshastigheten
- = 25 000 år – God tur!

- Hva hvis vi må dra?
- ... ut i solsystemet?
- ... eller dra virkelig langt ut? Som en Noahs Ark?



# Diskusjonsoppgave

Kan jeg bruke science fiction som platform i min egen undervisning?

- Bærekraft
- Klima
- Miljø
- Problemløsing
- Design
- ...

# Problemløsere for morgendagen



*"At some point, everything's gonna go south on you and you're going to say, this is it. This is how I end."*

*Now you can either accept that, or you can get to work. That's all it is. You just begin. You do the math. You solve one problem and you solve the next one, and then the next...*

*And if you solve enough problems, you get to come home."*

***(Mark Watney, fictional astronaut)***

Science fiction-bøker , film, serier nevnt:

‘Words of if – A retrospective anthology’ Ed. Frederik Pohl et al.1986

‘The Martian’ Andy Weir, 2014, (film 2015 regi Ridley Scott)

‘The Mars trilogy’ Kim Stanley Robinson; ‘Red Mars’/‘Green Mars’/ ‘Blue Mars’ 1992 – 1996

‘The word for world is forest’ Ursula K. LeGuin, 1972

‘Stand on Zanzibar’ John Brunner, 1968

‘Make room! Make room!’ Harry Harrison, 1966 (film ‘Soylent green’ 1973)

‘Bienes historie’ Maja Lunde, 2015

‘Antarctica’ Kim Stanley Robinson, 1997

‘Memory of water’ Emmi Itäranta, 2014

‘The Road’ Cormac McCarthy, 2006 (film 2009 regi John Hillcoat)

‘The hunger games’ (trilogi) Suzanne Collins 2008-2010, (film-serie 2012-2015)

‘The Handmaids Tale’ Margaret Attwood ,1985 (TV-serie Hulu/HBO 2016 -)

Andre kilder:

‘Thank Heaven for Little Girl’, song, Lerner/Loewe/Chevalier, 1957, fri parafrasering  
Stanley Stella, T-shirt.

Hellyer Gorge, Tasmania, rainforest. 2006, Wikimedia.

UN: World population highlights, 2019

IPCC: Special Report on Climate Change and Land (SRCCL), 2019

Forskning.no: Storfekjøtt er miljøversting 2014.08.05

Landbruk.no: Hva er egentlig bærekraftig matproduksjon? 2019

Felleskjøpet.no: div. produkter / artikler, 2019

Helsedirektoratet.no: ‘Bærekraftig kosthold’, 2017

Bioforsk.no

Aftenposten: Vi kaster hver femte handlepose, 2015.05.24

Matvett.no: Vi hjelper deg å kaste mindre mat

Dagbladet /Kiwi 2019: Slik vil butikkhyllene se ut om humlene forsvinner, 2019.07.23

BBC: What would happen if bees went extinct?, BBC Science & Environment 2014

CSIRO: ‘Bubbles in ice’, Commonwealth Scientific and Industrial Research Organisation 2000

BBC: The 11 cities most likely to run out of drinking water - like Cape Town 2018.02.11

Flagstaffotos: Fir0002/Flagstaffotos, Benambra, Victoria, Australia, 2006