



Press Invitation

Professor Willy Baeyens (VUB) holds a press conference on Tuesday October 20 about the SeaExplorer

Save the climate by fertilizing the oceans

- **Location:** U-Residence (Campus Etterbeek), Generaal Jacqueslaan 271, 1050 Elsene
- **Start time:** Welcome from 10h15 to 10h45
- **Programme:** 10h45 Address by Rector Prof. P. De Knop
11h Press Conference by Prof. W. Baeyens

Professor Willy Baeyens of the Vrije Universiteit Brussel will fertilize the oceans to save the climate. This fertilization stimulates the plankton growth and as a consequence increases the absorption of CO₂ from the atmosphere. And CO₂ is the big evildoer of the earth's warming up. Professor Baeyens is carrying out this research with the SeaExplorer robot.

Everybody knows that the CO₂-concentration in the atmosphere has to be reduced drastically. This can be achieved in 2 ways: by restricting the CO₂-production or by increasing the CO₂ absorption. For the latter, marine phytoplankton is extremely efficient. However: research indicates that it is not everywhere as abundantly present in the oceans. How can one arrange that its biomass increases? The answer is fertilization with nutrients, that are essential substances for the plankton. To know which and where nutrients have to be added, novel research is needed. Therefore, VUB bought an ocean robot and equipped it with special, home-made sensors.

Climate Lifesavor

VUB developed special sensors which can be incorporated in the SeaExplorer: these are the only sensors for that instrument which can measure all nutrients in the oceans and make it possible to map their spatial distribution.

Scientific background

How oceans absorb CO₂?

Oceans and more in particular marine plankton, play a huge role in the absorption of CO₂. Since the seventies VUB performs research in all of our oceans. This research revealed us that in some areas high concentrations of plankton show up, while in others, linked to specific conditions, much lower amounts occur.

As a consequence, oceans can be classified in areas with a high, medium or low productivity. The latter ones can be compared with a desert on land.

The biomass of plants in the ocean (= phytoplankton) is 0.5% of that on land but their CO₂-absorption is 45% of all plants on the planet. Hence, plankton plays a crucial role in the absorption and processing of CO₂ from the atmosphere.

The CO₂-absorption by the marine phytoplankton is more than 10 times the total emissions of the UE and double that of the globe, however, only a quarter sinks to the deeper ocean while the remaining returns to the atmosphere within the year. Therefore, we must increase the CO₂-absorption by marine phytoplankton and this is not impossible, only the necessary knowledge to accomplish it is lacking.

Nature and science

Plankton can only live in areas containing the "necessary nutrients". Due to several environmental circumstances large areas in the oceans are lacking some of those nutrients resulting in a limited plankton productivity as well as CO₂-absorption. Supplying the lacking nutrients in those oceanic areas, also called fertilization, will stimulate further plankton growth and CO₂ absorption.

The geographic areas in the oceans where enough nitrogen and phosphorous (these are major nutrients) are present but where others (trace nutrients) are limited could be mapped. However,

until now one failed to identify the limiting trace nutrients because their concentrations are too low to be measured with the existing, conventional instruments.
An important step has been taken: VUB has developed, together with the SeaExplorer producer ALSEAMAR, an autonomic instrument that is able to measure concentrations of trace nutrients, even the bioavailable forms, in nitrogen and phosphorous rich ocean areas. This instrument will be shown and its functioning will be discussed during the press conference.
Once we know which nutrients are lacking, we can add them in a time-, dose- and element-specific manner to the ocean stimulating the plankton growth, simultaneously reducing the CO2 concentration in the atmosphere. These further steps will also be presented at the press conference.

Prof Willy Baeyens

Doctor in Chemistry Willy Baeyens graduated in 1977 at VUB. Since the seventies prof. Baeyens acquired a large expertise in marine research. His career started with the "Project North Sea", an interdisciplinary project funded by the Belgian government. He studied the behavior of nutrients and pollutants and the relation between nutrients and plankton growth.

After a stay of several years within the Mathematical Model of the North Sea where he developed models of the marine ecosystem, he returned at VUB. Here he focused on the analyses of ultra low amounts of trace metals in the marine environment. Some of these trace metals are nutrients for plankton. Related to these studies, prof. Baeyens participated at cruises in the Southern, Pacific and Atlantic Oceans.

In addition, prof. Baeyens performed research in Great Lakes such as Baikal, Teletskoye and Tanganyika.

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