

**Diffuse phosphorus input to surface waters**  
- new concepts in removal, recycling and management -

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## TSTC 3 & TSTC5

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### Deliverable D4.6 & D4.9

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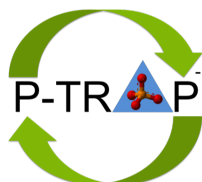
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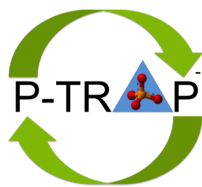


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D4.2 – 1<sup>st</sup> Science School

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## 1. Executive summary

The Transferable Skills Training Courses (TSTC) are important network-wide training components to strengthen competencies and knowledge outside the individual ESR projects. At the kick-off meeting the consortium decided that these two training events are complementing each other quite well and combining them would be more beneficial for the ESRs. Thus, in contrast to the initial planning TSTC3 were held associated to TSTC5 and by this postponed. Both trainings were given in project months 29, followed by all P-TRAP ESRs.







TSTC3 (P-TRAP seen from a stakeholder's perspective) aimed on the networking aspect with dedicated stakeholders and to give a first idea about how companies are organized and implement P-TRAP relevant aspects into their business model. TSTC5 (Entrepreneurship: from innovative idea to business plan) was more practical orientated and gave the ESRs the opportunity to develop their own business concept and introduce it to a selected audience.

The training courses were organised by Deltares, in collaboration with the UU. Several P-TRAP partner organisations such as AquaMinerals, GEOS and Arcadis were involved.

## 2. Organisation and content of TSTC3 & TSTC5

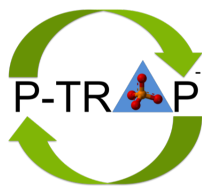
During the two courses the ESRs were introduced to the business models of several stakeholders who are active within P-TRAP, exemplary of companies such as Deltares, AquaMinerals, Arcadis, GEOS and the University of Utrecht as an academic stakeholder. Additionally, they made the first steps in the development of their own business cases. For the latter they were asked in advance to come up with individual ideas about possible business cases, of which the most promising ones were chosen to be further developed during the course.

Suggested topics were

-  A material that can be used as a soil conditioner. A material (Biovivianite- mediated from Fe-P bioreduction processes) that can be added to soils to improve the plants growth. Could P from this biologically mediated material be easily taken up by plants?
-  A selective PO<sub>4</sub> sink, which e.g. mimics the uptake of PO<sub>4</sub> by plants, but does not interfere with the system (pH change, ionic strength, anions released...)
-  A device that maintains oxygen at a constant saturation level and stores the measurement data on a website. A prototype is available based on wifi-arduino (ESP 32) connected to an oxygen sensor and a relay ([www.ksash.nl/Ox\\_Exp\\_10052021.php](http://www.ksash.nl/Ox_Exp_10052021.php)). Instead of an expensive gas mixture determine the oxygen sensitivity of sediment with the help of an electronic device that is virtually inexhaustible.
-  Harvest algae and ferment them (to extract methane) and recover the P by ashing coupled with extraction and sell this P.
-  Techniques to enhance the availability of P from vivianite or other dried iron sludge.
-  Puri bank: creating an iron bank and let the water infiltrate through the bank. The dephosphatised water can be used as inlet water for vulnerable aquatic ecosystems.

The first day was a “Welcome” moment and dedicated to an introduction of the company Deltares to the ESRs. They visited some of the experimental facilities at the dependence in Delft and learned about the business model of Deltares. On Tuesday Noorderwind (<https://www.noorderwind.co>) organized a workshop about the basics of business models. ESRs learned about the importance of asking the right questions to develop their own business cases and investigate its anticipated success. This topic was intensified on Wednesday and the ESRs worked in groups on the elaboration of two selected business ideas, which they pitched to a (remote) audience of the P-TRAP PIs on Thursday.

The course was followed by the 3<sup>rd</sup> Supervisory meeting on Friday and closed with an (optional) outdoor networking activity.



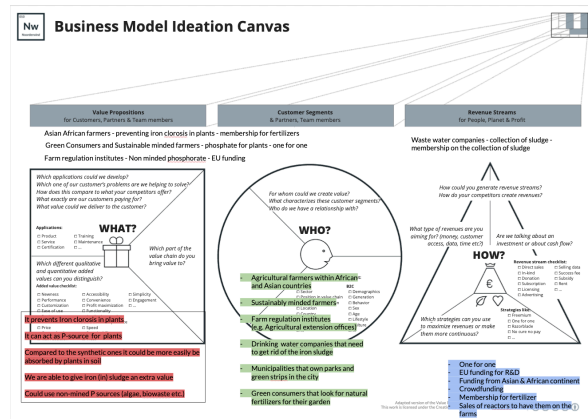
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### 3. Impressions of TSTC3 & TSTC5



**Fig. 1:** Workshop at Deltares



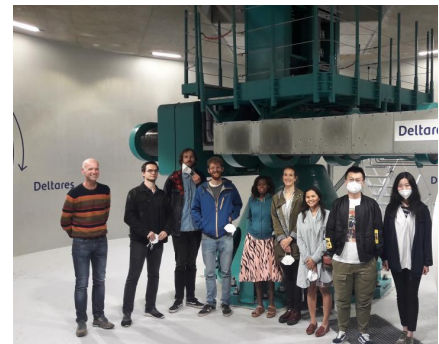
**Fig. 2:** What are the questions needed to be answered when you develop your own business case? Workshop on business models by Noorderwind (<https://www.noorderwind.co>)



**Fig. 3:** Visit of the hydro facilities at Deltares, Delft (<https://www.deltares.nl/en/facilities/>)



**Fig. 4:** Visit at the Delta Flume, Deltares, Delft (<https://www.deltares.nl/en/facilities/delta-flume/>)



**Fig. 5:** Visit of the GeoCentrifuge at Deltares, Delft (<https://www.deltares.nl/en/facilities/geocentrifuge/>)



**Fig. 6:** Group work on selected business cases



**Fig. 7:** Pitch training



**Fig. 8:** Pitch to the remote audience



**Fig. 9:** Outdoor networking activity

### 3. Agenda

**Monday, 12 July 2021 (Delft)**

**D4.6 & D4.9 - ESRs**

<b>15.00</b>	Visit Deltares
<b>16.00</b>	Welcome
<b>16.30</b>	Entrepreneurship in practice by Deltares (Anniek de Jong)
<b>19.00</b>	Joint dinner

Tuesday started with the workshop on business models

**Tuesday, 13 July 2021 (Delft)**

**D4.6 & D4.9 - ESRs**

<b>9.00</b>	Workshop business model fit I (Sanne Mylonas / Boukje Vastbinder, Noorderwind)
<b>12.30</b>	Lunch
<b>13.30</b>	Entrepreneurship in practice by AquaMinerals (Olaf van der Kolk)
<b>14.00</b>	Workshop business model II (Sanne Mylonas / Boukje Vastbinder, Noorderwind)
<b>15.30</b>	Elaborating your business case – group work
<b>19.00</b>	Joint Dinner

**Wednesday, 14 July 2021 (Delft)**

**D4.6 & D4.9 - ESRs**

<b>9.00</b>	Cost-benefit analyses (Mark de Bel, Deltares)
<b>11.00</b>	Entrepreneurship in practice by Utrecht University (Mirjam van Kan-Parker)
<b>11.30</b>	Visit geotechnical facilities Deltares
<b>12.30</b>	Lunch
<b>13.30</b>	Entrepreneurship in practice by GEOS (Susan Reichel)
<b>14.00</b>	Elaborating your business case – group work
<b>15.00</b>	Visit YesDelft (Edoardo Repetti / Pablo Benítez)
<b>17.30</b>	Transfer to Utrecht

**Thursday, 15 July 2021 (Utrecht)**

**D4.6 & D4.9 - ESRs**

<b>9:00</b>	Pitch training (Sanne Mylonas / Boukje Vastbinder, Noorderwind)
<b>11.30</b>	Pitching your business case to an audience (PIs invited - online)
<b>12.30</b>	Entrepreneurship in practice by Arcadis (Aron Kelderman, Arjen Koomen)
<b>14.00</b>	Preparation ESR project pitch





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## 4. Participants

All ESRs participated in the training, however, due the pandemic situation three out of eleven participated remotely. For the ESRs meeting in person, face masks and self-tests were provided, and the room size followed the current rules at Deltares and the UU.

## 5. Evaluation

Since feedback is crucial to improve the courses not only within P-TRAP but also for follow-up projects the ESRs are asked to evaluate their courses. For these two training events the ESRs received a MentiMeter questionnaire (<https://www.menti.com/rdo3w88kav>) with 6 questions to rank and comment on. 9 out of 11 returned the questionnaire.

In total the training was highly appreciated as useful and with clear learning outcomes. Particularly the social aspect was highlighted as a moment of motivation and networking. The training was experienced as interesting and useful due to adding extra skills for a career path after the current PhD path, clearly shown by the overall ranking 8.0 out of 10.

### The course was...

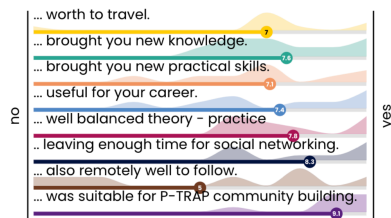


Fig. 10: General experience of the training

### The parts were interesting / useful

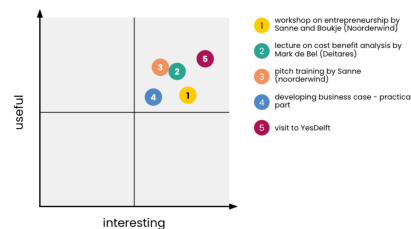


Fig. 11: Feedback on individual parts of the training

### Entrepreneurship in practice was / encourage me ...

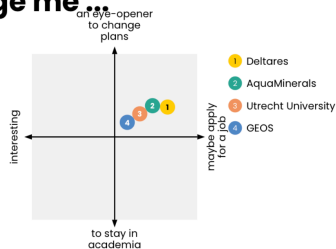


Fig. 12: General experience of the Entrepreneurship in practice part

### What is your overall rate for the course?

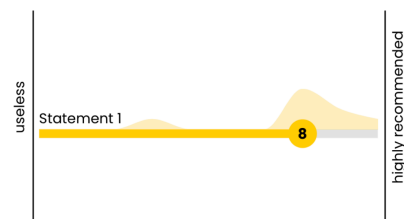


Fig. 13: Overall ranking of the training

## 6. History of the deliverables

Date	Actions / Changes
March 2021	First draft of the agenda
April 2021	Organisation meeting UU / Deltares, invitation speakers
May 2021	Check with ESRs on concerns physical meeting, organisation meeting UU / Deltares
June 2021	Agenda finalised, hotel room blocked for individual reservations
July 2021	Final check travel and safety requirements