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Upcoming events and calls for papers

Programme finalised for organic fertilisers summit



The [programme](#) for the 1st **Summit of the Organic Fertiliser Industry** in Europe ([SOFIE](#), 5-6 June 2019, Brussels) is now finalised, with speakers including leading organic fertiliser manufacturers CEOs, agronomists, legal experts and the European Commission. The summit will enable dialogue between organic and organo-mineral fertiliser producers, scientific experts and regulators on the agronomic proof of benefits of these products, market developments and new products for farmers in Europe and for export, and opportunities and challenges of European regulation, in particular the new EU Fertilising Products Regulation (now finalised, see below) with European

Commission DG GROW. The summit is organised by ESPP, in partnership with IFS (International Fertiliser Society), and will back-to-back to the [IFS technical conference](#) 4th – 5th June www.fertiliser-society.org/event/2019-ifs-technical-conference.aspx

Programme: www.phosphorusplatform.eu/SOFIE2019 Registration SOFIE www.eventbrite.co.uk/e/sofie-organic-fertilizers-summit-tickets-55703185728 and IFS Technical Conference June www.fertiliser-society.org/event/2019-ifs-technical-conference.aspx

Waste water phosphorus removal tomorrow: ambitions and reality

9th October, Liège, near Brussels. In the context of the current revision of EU water policy (Water Framework Directive, Waste Water Treatment Directive), and with participation of the European Commission (DG ENVI, DG RTI), this workshop will enable dialogue between the water industry, experts and policy makers (EU, national) on perspectives for phosphorus (P) removal: low discharge consents, flexible permitting / emissions trading, P-removal from small sewage works. To participate, contact info@phosphorusplatform.eu

In partnership with / supported by: IWA (the International Water Association), Eureau, CIWEM (Chartered Institution of Water and Environmental Management), Université de Liège and ECSM'19 (European Conference on Sludge Management), Liège 6-8 October 2019 <https://events.uliege.be/ecsm2019> for information on the phosphorus removal workshop, contact info@phosphorusplatform.eu



Call for papers: resource recovery from waste water

Open to 1st July 2019. 'Water Research' journal [special issue](#) "Resource recovery from water: from concept to practice". In coordination with abstracts for the IWA Resource Recovery Conference, Venice, 8-12 September, [IWARR2019](#) Topics targeted are: pilot scale demonstration of resource recovery technologies, synthesis of value-added products, linking value chains, perspectives on resource recovery in next-generation waste water infrastructure, financing and policy, societal opportunities and barriers.

Call for papers open to 1st July 2019, Water Research special issue www.journals.elsevier.com/water-research/call-for-papers/resource-recovery-from-water-from-concept-to-practice

IWA Resource Recovery conference IWARR2019 Venice 8-12 September 2019 www.iwarr2019.org

9th International Phosphorus Workshop (IPW9)

"Putting phosphorus first? How to address current and future challenges". ETH, Zurich, Switzerland, 8-12 July 2019. The 9th International Phosphorus Workshop ([IPW9](#)) will address five research themes: (1) phosphorus scarcity; (2) optimizing regional and national phosphorus cycles; (3) sourcing phosphorus fertilizers; (4) efficient phosphorus use in agroecosystems; and (5) environmental phosphorus problems.

Website IPW9 www.ipw9.ethz.ch



Save the date: ESPC4

The 4th European Sustainable Phosphorus Conference is fixed for Vienna, 15-17 June 2020.

See more events at www.phosphorusplatform.eu/upcoming-events

EU Fertilisers Regulation

Commission call for comments on criteria for "by-products"



The European Commission has circulated a call for input (from members of the EU Fertilisers Working Group) on "criteria on agronomic efficiency and safety for by-products", that is "for the use of by-products as fertilising products" under the new EU Fertilisers Regulation. The new Regulation specifies that the Commission must adopt a 'delegated act' fixing these criteria within three years. This call for comments is the first stage of input to this process. A two and a half page document by the European Commission, **open to comment until 19th April 2019**, recalls the definition of by-products in the Waste Framework Directive and reminds that under the new Fertilisers Regulation by-products can (under certain conditions) be used directly in fertilisers (the by-product is itself a 'CMC') or

be reacted with other materials before use (the product resulting from the reaction is the 'CMC'). The document poses the following questions: safety or agronomic criteria or specific restrictions for by-products used in fertilising products in national regulations, list of authorised by-products for use in fertilising products (including origin industries), which by-products are currently used (and market size, nutrient content or other function ...), application of the Waste Framework Directive.

European Commission call for input on future "Criteria on agronomic efficiency and safety for by-products" under the new EU Fertilising Products Regulation <https://circabc.europa.eu/ui/group/36ec94c7-575b-44dc-a6e9-4ace02907121/library/ce26e854-5970-4ee6-b1ee-5decfd37515c/details>

Please send as soon as possible any relevant information or documents, which we can use in our response to this call for input, to ESPP_info@phosphorusplatform.eu

New EU Fertilisers Regulation finally adopted

The European Parliament has concluded the legislative adoption of the new EU Fertilising Products Regulation, by validating the "trilogue" compromise text in a plenary vote on 27th March. This new Regulation will open the European market for recycled nutrient products, and also for nutrient recycling technologies. It covers organic, organo-mineral and mineral fertilisers, composts, digestates, food industry by-products, as well as other products such as liming materials and fertiliser polymers. Because this is a 'Regulation', it will be applicable across Europe without requiring Member State transposition. However, it will only be fully applicable three years after publication, to allow time for implementation. After that date, any EU Fertilising Product can be sold in any EU country. Member States will also have the continuing possibility to authorise other products in their country as 'national' fertilisers. A 'clean' version of the final EU Fertilisers Regulation text is not yet available, but the adopted version can be consulted [here](#). The adopted text does not cover struvite and recovered phosphate salts, ashes and ash-derived products, nor biochars / pyrolysis materials. These should be added to the Regulation after adoption by the European Commission, logically as proposed in the JRC STRUBIAS (final report not yet published).

Final 'trilogue' agreed text: <http://data.consilium.europa.eu/doc/document/ST-15103-2018-INIT/en/pdf>

Final text adopted by European Parliament 27th March 2019 www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+TA+P8-TA-2019-0306+0+DOC+PDF+V0//EN (NOTE: it is our understanding that these two texts should be the same, but the layout is different)

Sewage biosolids and manure

EU SafeManure study update



Wim Debeuckelaere, European Commission (EC) DG Environment, has provided an update of the EC Joint Research Centre (JRC) “SafeManure” study, which aims to define criteria for allowing certain nitrogen fertilisers derived (wholly or partly) from manure to be not treated as ‘processed manure’ under the Nitrates Directive (see ESPP eNews n°23). The study will include analysis and comparative testing of different fertilisers recovered from nutrients (identified to date: 86 materials from 7 sites in Italy, 11 in the Netherlands and 1 in Denmark, covering raw manure, solid/liquid fractions, digestate, reverse osmosis/mineral concentrates and nitrogen salts recovered from stripping). A review of existing literature has identified (to date) less than 20 relevant studies or reports, noting in particular a lack of data

concerning the composition of processed manure products, nitrogen release kinetics, environmental and health issues and a lack of experimental evidence comparing nitrogen leaching or plant fertiliser effectiveness of recycled nutrient products to mineral fertilisers. In particular, comparative trials are lacking for recovered nitrogen salts and struvite. ESPP suggests that this is unsurprising: there is no reason to compare e.g. recovered ammonium sulphate with synthetic ammonium sulphate because it is the same chemical, and the many published tests on struvite do not look at the nitrogen release because struvite is a phosphate fertiliser. The project planning anticipates biogeochemical modelling and pot trials in Spring 2019, field tests in Spring and Autumn 2019 and a draft report and stakeholder workshop and 2019/early 2020.

Input of further data, existing studies and reports or material analysis are welcome. The full list of studies already submitted to and analysed by JRC is at www.phosphorusplatform.eu/regulatory DG ENVI slides, BioRefine ESNI conference Brussels 22 January www.biorefine.eu/esni-2019

Audit says US EPA not adequately risk assessing biosolids



An [audit](#) by the US EPA (Environmental Protection Agency) Office of Inspector General has concluded that the EPA is not assessing the possible impact of hundreds of pollutants present in biosolids (processed sewage sludge) used as fertiliser / soil improver in agriculture. The audit is based on existing reports and contacts both with EPA staff and with other US agencies, stakeholders and experts. The 60+ page report concludes that the EPA monitored only nine pollutants in biosolids (all heavy metals) whereas 352 other pollutants and contaminants can be present according to literature, of which 61 are designated as hazardous or as priority pollutants in other regulatory programmes. The audit notes that the EPA’s legally required biennial reviews of biosolids regulations (2013, 2015) had not been completed. Indeed, the EPA has today only two members of staff in its biosolids centre, covering some 2 700 major biosolids production facilities, despite nearly 50% of US sewage sludge production going to agricultural land.

The report notes that treated sewage sludge is a nutrient-rich material, valuable as an agricultural fertiliser, providing nitrogen, phosphorus and micronutrients (e.g. nickel, copper). Biosolids are indicated as improving soil properties, such as texture and water-holding capacity, because of their organic content, so favoring root growth and drought resistance. The report however notes that biosolids also contain a wide range of pollutants, including pharmaceuticals, steroids and hormones, flame retardants, perfluoroalkyl substances (PFAs) and perfluorooctanoate (PFOA), but without concluding that these substances pose a risk to health or the environment. Indeed, the report’s message is that the risk assessment of these substances is lacking and that additional research is needed to better understand their impacts.

The report made 13 recommendations, 8 of which are considered to be satisfactorily addressed by the EPA and five not (indicated by * below):

- 1-2. Better analysis of existing data in EPA biosolids control and permit systems and a national goal for biosolids inspections
3. Complete probabilistic risk assessment and screening tool for biosolids land application
4. Develop a plan to obtain data needed for risk assessment of the 352 other identified pollutants
5. Complete the biennial biosolids policy reviews
- 6-8. Publish guidance on biosolids pathogens, (*) on new technologies for pathogen reduction and on faecal coliform sampling
- 9-11. (*) Modify the current EPA public website statement and (*) public positions on safety of biosolids, pending above risk assessments, and (*) define whether a “disclaimer” on biosolids labelling is appropriate
- 12-13. Organise trainings for biosolids managers and State administrations and (*) maintain a website knowledge base for these users.

“EPA Unable to Assess the Impact of Hundreds of Unregulated Pollutants in Land-Applied Biosolids on Human Health and the Environment”, US EPA Office of Inspector General, Report No. 19-P-0002, November 15, 2018 www.epa.gov/sites/production/files/2018-11/documents/epa_oig_20181115-19-p-0002.pdf

Long-term plant availability of phosphorus from sewage biosolids

Analysis of soils from the CRUCIAL long-term field trials, Taastrup, Denmark, [show](#) that long-term sewage sludge application results in highly plant available phosphorus (P) in the soil. The CRUCIAL trials started in 2003, with soil samples for this study taken in 2014. Application rates were artificially high, resulting in total application equivalent to over 200 years at Danish regulatory maximum phosphorus input rates. Five soil treatments were compared: sewage sludge - see below (1), untreated cattle manure, composted source-separated household organic waste (2), mineral NPK fertiliser and unfertilised. Phosphorus in the sludge-fertilised soil was principally associated to iron, apparently independently from the iron content of the sludge, whereas the phosphorus in the NPK and manure fertilised soils was principally associated to organics, and to calcium in the compost-fertilised soils. Phosphorus in the sludge-fertilised soil showed the best plant availability (using DGT – Diffusive Gradients in Thin Films). This was confirmed by high grain yields and the highest P concentration in grains, and highest yield and P concentration in pea shoots, in the sludge-fertilised soils.

(1) Sewage sludge, after dewatering, from Avedøre municipal sewage works, Copenhagen, flocculated with Fe(III) salts.

(2) Compost produced by BioVækst, Solum (using AIKAN technology).

"Phosphorus characterization and plant availability in soil profiles after long-term urban waste application", N. Glæsner, J. Magid et al., *Geoderma* 338 (2019) 136–144 <https://doi.org/10.1016/j.geoderma.2018.11.046>

Long-term field test show benefits of organics

Maltas et al. (2018) [summarise](#) results of 37 years long-term field trials at Agroscope, Changins, Switzerland (calcaric cambisol, altitude 440m) 1976-2013. Treatments were mineral fertilisation with optimal nitrogen (N) and without N and five organic amendments also receiving optimal N as mineral fertiliser (same dose for all treatments, that is additional to N in the organic amendment): green manure, cereal straw, fresh cattle manure at two dose levels and cattle slurry. All treatments received optimal N and K as mineral fertiliser. The mineral N fertiliser alone (without organics) increased soil organic carbon (+16% in top 20 cm of soil after 36 years), soil microbial activity and microporosity, but reduced soil pH, magnesium and macroporosity. All the organic amendment treatments with mineral N also showed increases of organic carbon, all marginally higher than for mineral N only. Only the high dose of fresh manure resulted in significantly higher organic carbon (+56% compared to zero-N control). The carbon retention coefficient (% of organic carbon supplied in amendment which is retained as increased soil organic carbon SOC) varied from 1.6% (green manure) to 13.6% (high fresh manure dose). Manure treatments showed higher grain yields than with mineral fertiliser alone, whereas the low-nutrient amendments (green manure, straw) showed lower yields, probably because the organic content immobilizes soil nutrients. The authors conclude that low nutrient organic amendments are effective in preventing soil degradation, but require higher mineral fertiliser inputs to maintain crop yield.

"The effects of organic and mineral fertilizers on carbon sequestration, soil properties, and crop yields from a long-term field experiment under a Swiss conventional farming system", A. Maltas et al., *Land Degrad Dev.* 2018;29:926–938 <https://onlinelibrary.wiley.com/doi/10.1002/ldr.2913#>

Science review on manure-based fertilisers phosphorus efficiency



NIBIO (Norway Institute of Bioeconomy Research) has published a concise (26 page) [review](#) of how manure treatment technologies impact phosphorus fertilisation, based on 45 scientific publications and reports. The summary covers solid-liquid separation (sedimentation, centrifuge, filtration with or without pressure, use of flocculants, electrocoagulation), growing micro-algae, anaerobic digestion, acidification, incineration ash, biochars, recovered phosphate salts. Literature data are provided on water content and phosphorus content on materials from these different processes, and results are presented from around a dozen different studies testing the plant availability and phosphorus (P) fertiliser effectiveness of different processed manure products. The report concludes that mechanical solid-liquid separation (including using flocculants) does not appear to modify the plant availability of P in manure, but that the solid fraction tends to have lower availability because the more available P is in the liquid phase. Composting appears to reduce P availability, whereas studies on

anaerobic digestate are insufficient. Thermal treatment tends to reduce phosphorus availability: lower in ash than in biochars. Acidification increases the fraction of dissolved phosphorus in manure, and may negatively impact solid-liquid separation processes. Overall, the report concludes that a range of technologies exist which can facilitate manure resource recycling without negatively impacting phosphorus plant availability.

"Manure-based recycling fertilisers. A literature review of treatment technologies and their effect on phosphorus fertilisation effects"; NIBIO (Norwegian Institute of Bioeconomy Research), E. Brod, NIBIO report vol. 4, n°91, 26/6/2018, ISBN 978-82-17-02141-4 <https://brage.bibsys.no/xmlui/handle/11250/2503440> delivered as part of the project "Nutrients in a Circular Bioeconomy: Barriers and Opportunities for Mineral Phosphorus Independence in Norway (Mind-P)" (D. Müller, NTNU).

Achieving demanding pollutant removal requirements in Sweden sewage works

A concise [article](#) from KTH Sweden summarises innovative technologies now being implemented in Sweden to achieve demanding treatment requirements for sewage works for the protection of the Baltic Sea. The HELCOM Baltic Sea Action Plan (2009, modified 2013) requires phosphorus (P) removal from all sewage works > 2 000 p.e. to 0.1 or 0.2 mgP/l. Large sewage works in Sweden already have limits of 0.3 mgP/l, and the authors consider that 0.2 mgP/l can be achieved by chemical P-removal combined with tertiary filtration (to remove small particles of phosphorus generated by the chemical precipitation). The Baltic Action Plan also requires 70 or 80% nitrogen (N) removal and 6 mgN/l discharge. Several sewage works in Sweden are

already operating Anammox processes on sludge dewatering liquor, so reducing mainstream nitrogen load by 15-20%. These Anammox installations are based on biofilm, Kaldnes carriers and granulated sludge (DEMON). Pilot studies of mainstream Anammox are underway at two sites. Membrane aerated biofilm reactor (MABR) is another solution for nitrogen removal: tested at the pilot scale, 94% ammonia removal and 40-60% total nitrogen removal were achieved. A number of technologies are offered for removal of pharmaceuticals from the water discharge stream from sewage works, and a combination of ozone treatment and granular activated carbon (GAC) looks most promising. The authors underline that implementation of these technologies in sewage works requires large investments.

"Innovative technologies in municipal wastewater treatment plants in Sweden to improve Baltic Sea water quality", J. Trela, E. Plaza, E3S Web of Conferences 45, 00113 (2018) INFRAEKO <https://doi.org/10.1051/e3sconf/20184500113>

R&D opportunities

Leibniz Phosphorus Campus Rostock opens 14 PhDs



Leibniz Science Campus Phosphorus Research, Rostock, Germany, is [opening](#) 14 doctoral studentships, co-tutored by the Leibniz Institute and the University of Rostock. Themes covered include phosphorus recycling in livestock production, phosphorus efficiency in fertilisers and in livestock, phosphorus governance, phosphorus chemistry and organocatalysts, phosphorus metabolism.

Leibniz Wissenschaftscampus Phosphorforschung Rostock www.wissenschaftscampus-rostock.de
PhD information www.wissenschaftscampus-rostock.de/aktuelles/neuigkeiten-archiv/neuigkeiten/id-14-neue-doktorandenstellen-gn-im-p-campus-zu-besetzen.html

Update on EU R&D funding and Horizon Europe



A presentation by Pavel Misiga, European Commission (Research and Innovation) in Brussels, 22 January, summarised upcoming EU funding possibilities for nutrient-related R&D and the status of preparation of the next EU R&D funding programme, Horizon Europe, which will follow after Horizon 2020. Calls under Horizon 2020 closed in January and February 2019 will complement projects on nutrients already underway and include "Bio-based fertilisers from animal manures", "Organic fertilisers from biogas digestate" as well as calls on integrated water management in agriculture, bio-based business models for rural communities and a water smart economy. Two further relevant calls are expected in 2020 under Horizon 2020:

bio-based fertilisers from agri-food, aquaculture and forestry by-products and bio-based fertilisers from waste water and from sewage sludge. Additionally, a 100 M€ "Circular Economy Thematic Investment Platform" is expected to be launched in 2020. The future Horizon Europe programme is currently under discussion in Parliament and Council. The Commission's proposal suggests five thematic clusters, including (as currently discussed) "Bioeconomy, food, natural resources and environment", which is expected to specifically include: agriculture, food systems, bio-based innovation/bioeconomy and circularity. Additionally, five "Missions" are proposed, with current Council proposals including "Soil health for sustainable food" (under discussion). The outline for Horizon Europe and strategic planning should be completed in 2019, and Horizon Europe launched in 2021. The European Commission is currently considering to propose to work towards a "Nutrients R&I Roadmap" to develop cooperation across different DG's, input to Horizon Europe and propose policy recommendations for the next Commission.

BioRefine European Sustainable Nutrient Initiative (ESNI) conference www.biorefine.eu/esni-2019

Regulation and policy

EU takes Cyprus, Italy, Greece and Slovenia to court on nutrients

The European Commission has engaged legal proceedings with the European Court of Justice against Cyprus, Italy and Slovenia for failure to adequately treat municipal sewage (EU Waste Water Treatment Directive 1991/271/EEC). These proceedings concern failure to adequately collect and treat municipal wastewater for 31 agglomerations in Cyprus and 16 in Italy of population equivalent > 2 000 p.e., and 11 agglomerations > 10 000 p.e. in Slovenia. Greece is referred back to the European Court for ongoing failure to implement the EU Nitrates Directive (1991/676/EEC), following a first condemnation by the Court in April 2015 (C-149/14), for failure to establish Nitrate Action Programmes in twelve Nitrate Vulnerable Zones (NVZs) – with requested financial penalties of 1.3 million € plus 24 000 € per additional day of non-compliance). Italy has also been referred to the European Court for failure to protect citizens against air pollution in ten agglomerations (total of over 7 million people) with failure to respect limit values for NO₂ fixed by the EU air quality directive (2008/50/EC). This follows actions already

underway (May 2018) against France, Germany and the UK concerning air NO₂ levels and also against Italy (May 2018) concerning airborne particles.

"Commission takes CYPRUS to the Court of Justice for failure to properly treat urban waste water" [IP/19/1474](#)

"Nitrates: Commission decides to refer GREECE to the Court of Justice and asks for financial sanctions" [IP/19/1482](#)

"Commission takes ITALY to Court over air pollution and failure to properly treat urban waste water" [IP/19/1475](#)

"Water: Commission urges SLOVENIA to ensure that urban waste water is adequately collected and treated" http://europa.eu/rapid/press-release_MEMO-19-1472_en.htm

EU Water Framework Directive compliance report concludes "very challenging"



The European Commission has [published](#) its fifth Implementation Report on the Water Framework Directive 2000/60/EC (including River Basin Management Plans and the Floods Directive 2007/60/EC and Floods Risk Management Plans). The Commission (COM) concludes that *"full compliance with the WFD's objectives by 2027 ... seems at this stage very challenging"*. This might be considered to be a significant understatement: as only 40% of Europe's surface waters (75% of groundwaters) are today in "good" quality status (see also ESPP eNews [n°31](#)) and COM notes that over the last five years *"only a limited number of water bodies have improved in status"* despite "substantial efforts" made to implement the Water Framework Directive. The report notes that Ireland and Greece failed to deliver their RBMPs (river basin

management plans) for 2015-2021 so are not assessed. It concludes that around half of Europe's water bodies are concerned by exemptions (from quality status obligations) proposed by Member States. COM underlines that the justifications for these exemptions need to better ensure that objectives of other water bodies are not compromised, and that minimum requirements fixed by other EU environmental legislation are respected. Environmental association EEB underlined that Member States should focus on improving water quality, not on justifying exemptions. The COM report notes that agriculture is *"amongst the most significant pressures"*, both for over-abstraction of water and diffuse pollution, and that in half the cases there is no assessment as to whether the measures taken to address this will be sufficient to achieve quality status objectives. Another area where significant gaps are identified is that of water pricing and cost recovery (e.g. Austria, Belgium, Spain, Finland, Italy). Impacts of climate change will be substantial, and require better consideration in some Member States. Agricultural / nutrient pollution is specifically cited as requiring action in Bulgaria, Czech Republic, Germany (esp. nitrates), Denmark, France, Croatia (sewage treatment), Italy (sewage treatment), Luxembourg (agriculture), The Netherlands (agriculture) and Romania (sewage treatment).

Water Framework Directive and Floods Directive implementation reports page http://ec.europa.eu/environment/water/water-framework/impl_reports.htm

Fifth Water Framework Directive implementation report, 26/2/2019 COM(2019) 95 final <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=COM:2019:95:FIN&from=EN>

US promotes nutrient recycling and water quality trading



The US EPA has stated that nutrient emissions is a "key water priority". With this objective, EPA has announced ([6 Feb. 2019](#)) a new water quality trading policy, with emphasis on reducing nutrient emissions, and has signed an agreement with the Water Research Foundation (WRF) to develop manure nutrient recycling technologies. The water quality trading policy incites implementation of market-based instruments at the catchment scale, including water quality credits and offsets, and indicates funding possibilities for non-point land use practices. This is part of a joint action between the US EPA (Environmental Protection Agency) and USDA (Department of Agriculture) to promote collaborative actions to address excess nutrients ([4 Dec. 2018](#)) in particular by "taking steps to decrease sedimentation and nutrient runoff from agricultural lands". The Memorandum of Understanding (MoU) signed with WRF ([1 Feb. 2019](#)) aims to develop cost-effective technologies for nutrient recycling from manures by disseminating information, enabling dialogue and facilitating on-farm testing and evaluation of technologies. The MoU brings no new funding, and will coordinate existing mechanisms, such

as WRF's "LIFT" programme to identify, assess and disseminate promising emerging technologies. The EPA has also launched a [study](#) of nutrient removal in municipal sewage works (POTWs = publicly owned treatment works). A questionnaire has been sent to operators to improve US national data on nutrient removal and nutrient discharges from POTWs, case studies will be selected with the aim of identifying low-cost and effective solutions for reducing nutrient discharges and a stakeholder forum will be established to exchange information.

"EPA announces new water quality trading policy memorandum", press release, 6 February 2019 www.epa.gov/newsreleases/epa-announces-new-water-quality-trading-policy-memorandum

"EPA and USDA Encourage Use of Marketbased and Other Collaborative Approaches to Address Excess Nutrients", press release, 4 December 2018 www.epa.gov/newsreleases/epa-and-usda-encourage-use-market-based-and-other-collaborative-approaches-address

"EPA Signs MOU with The Water Research Foundation Advancing Nutrient Management Efforts", 1 February 2019 www.epa.gov/newsreleases/epa-signs-mou-water-research-foundation-advancing-nutrient-management-efforts

"National Study of Nutrient Removal and Secondary Technologies", US EPA, 5 October 2018 www.epa.gov/eg/national-study-nutrient-removal-and-secondary-technologies

UN identifies nitrogen cycle a key emerging environmental issue



The United Nations Environment 'Frontiers' [report](#) (March 2019) identifies five major emerging environmental challenges: synthetic biology / biotechnology, ecological connectivity, melting permafrosts (CO₂ losses), maladaptation to climate change and disturbance of the global nitrogen cycle. The UN underlines that growing in livestock production and agriculture, but also in transport, industry and energy, result in emissions of nitrate to water and ammonia and nitrogen oxides (NO_x) to air, with impacts on climate change, air quality and on the ozone layer. The UN cites the European Nitrogen Assessment conclusion that 80% of nitrogen used in food

production is wasted, leading to pollution and wasted resources. Global costs of nitrogen losses (pollution and health impacts, economic losses) are estimated at 300 – 3 400 billion US\$/year ('Our Nutrient World' see SCOPE Newsletter [n°96](#)). The UN calls for more joined-up policies on nitrogen (addressing agriculture, water, air, climate) and for a move towards the circular economy for nitrogen and nutrients. The new EU Fertilisers Regulation is cited as an exemplary initiative towards facilitating recycling of organic materials, with significant related job creation potential (120 000 jobs indicated). The report also cites the development by [INMS](#) (International Nitrogen Management System initiative, supported by UN Global Environment Facility GEF) to develop guidance on integration of nitrogen flows, cost-benefit valuation and nitrogen scenarios. It is discussed to develop a UN inter-convention Nitrogen Coordination Mechanism, to ensure coherent implementation between MEAs (Multilateral Environmental Agreements) concerning nitrogen.

"It is time to fix the broken nitrogen cycle says UN Environment Frontiers Report", UNEP, 4 March 2019 www.unenvironment.org/pt-br/node/24450

UN Environment report "Frontiers 2018/19. Emerging Issues of Environmental Concern" 2019 ISBN: 978-92-807-3737-0 www.unenvironment.org/frontiers

Webinars and information

GWRC webcast and compendium on phosphorus recovery technologies

GWRC (the Global Water Research Coalition) has presented a 70 page '[Compendium](#)' on phosphorus (P) recovery from sewage / sludge / ash at a webcast, available [here](#). The webcast includes participants from the US EPA, the American Sustainable Phosphorus Alliance ([SPA](#)), P-REX Environment and the Water Research Federation. The 'Compendium' identifies over 110 phosphorus recovery installations operating today worldwide, of which most are struvite (or other phosphate salt) precipitation (over 20 technology suppliers cited). Other technologies indicated include EasyMining Ash2Phos and CleanMap, Remondis Tetraphos, Phos4Life, P.KON, Nippon PA, Glatt Sera and EcoPhos, all producing phosphoric acid or phosphate salts from sewage sludge incineration ash. As well as use of ash in phosphate fertiliser industry plants, and other technologies such as EuPhoRe, Budenheim Extraphos (carbon dioxide leaching), Metawater (alkaline ash leaching) which is operating in Gifu, Japan.

GWRC / Water Research Foundation webcast "Phosphorus Recovery and Management", 19th March 2019, available online www.waterrf.org/resources/webcasts/pages/PublicWebcasts-detail.aspx?ItemID=137

GWRC "Global Compendium on Phosphorus Recovery from Sewage/Sludge/Ash", February 2019

www.researchgate.net/publication/331982837_Global_Compendium_on_Phosphorus_Recovery_from_SewageSludgeAsh

SPA video summaries of phosphorus research



Sustainable Phosphorus Alliance

The [Sustainable Phosphorus Alliance](#) (SPA) promotes recently published phosphorus sustainability research by featuring it on the YouTube Channel "[Phosphorus Science Now](#)": Using web conferencing software, SPA works with authors to record a 5-10 minute discussion for rebroadcast using 4-5 slides provided by authors and summarising recently published science papers or other publications and reports. Author's time commitment for

production is likely to be less than an hour, and the video will be promoted via YouTube, the SPA website newsletter and social media free of charge. In the latest releases online, Kaushik Venkiteshwaran of Marquette University discusses strategies for recovering non-reactive phosphorus from wastewater and Céline Vaneekhaute of Université Laval describes a roadmap for choosing unit process configurations that best suit nutrient recovery from digestates.

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Global Nutrient Management Toolbox

At a [webinar](#) on 7th March, United Nations Environment (GPNM) and the World Resources Institute (WRI) presented the 'Global Nutrient Management Toolbox' developed and now available online. Nandula Raghuram, International Nitrogen Initiative, underlined that eutrophication impacts nearly 250 000 km² of waters worldwide, with a loss of ecosystem services of US\$ 200 billion/year. Sara Walker, WRI, demonstrated online the Toolbox, which includes a searchable data base of over 100 Best Management Practices, 150 nutrient policy mechanisms, case studies and an excel calculator tool which enables to simulate policy and management scenarios.

WRI / UNEP GPNM webinar 7th March 2019, slides available online www.wri.org/events/2019/03/webinar-global-nutrient-management-toolbox

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