

A CALL TO ACTION: ACCURATE MAPPING OF EMISSIONS TO GLOBAL FRESHWATER SYSTEMS IS STRATEGICALLY IMPORTANT FOR CHEMICAL EXPOSURE PREDICTION AND MITIGATION

Christopher M. Holmes^{1*}, Tom Austin², Scott Oram³, Sarah Argoud⁴, Stewart Owen⁵

¹Applied Analysis Solutions LLC, Winchester, VA, USA; ²Haleon CH SARL, Nyon, CH; ³Haleon UK, Surrey, UK; ⁴AstraZeneca, Gaithersburg, MD, USA; ⁵AstraZeneca, Macclesfield, UK

EFFECTIVE WATER STEWARDSHIP NEEDS SCIENCE-BASED APPROACHES TO BETTER UNDERSTAND GLOBAL FRESHWATER VULNERABILITY TO CHEMICAL EMISSIONS

Water is a vital resource, which is fundamental for human and ecosystem health. For too many people, a lack of equitable and sustainable access to water combined with poor water quality remain significant barriers to better health. For the freshwater environment, water quality correlates with the health and viability of aquatic related ecosystems, fundamental to biodiversity and a OneHealth approach. It is important to ensure that **water stewardship, problem identification, prioritization and action are science based**.

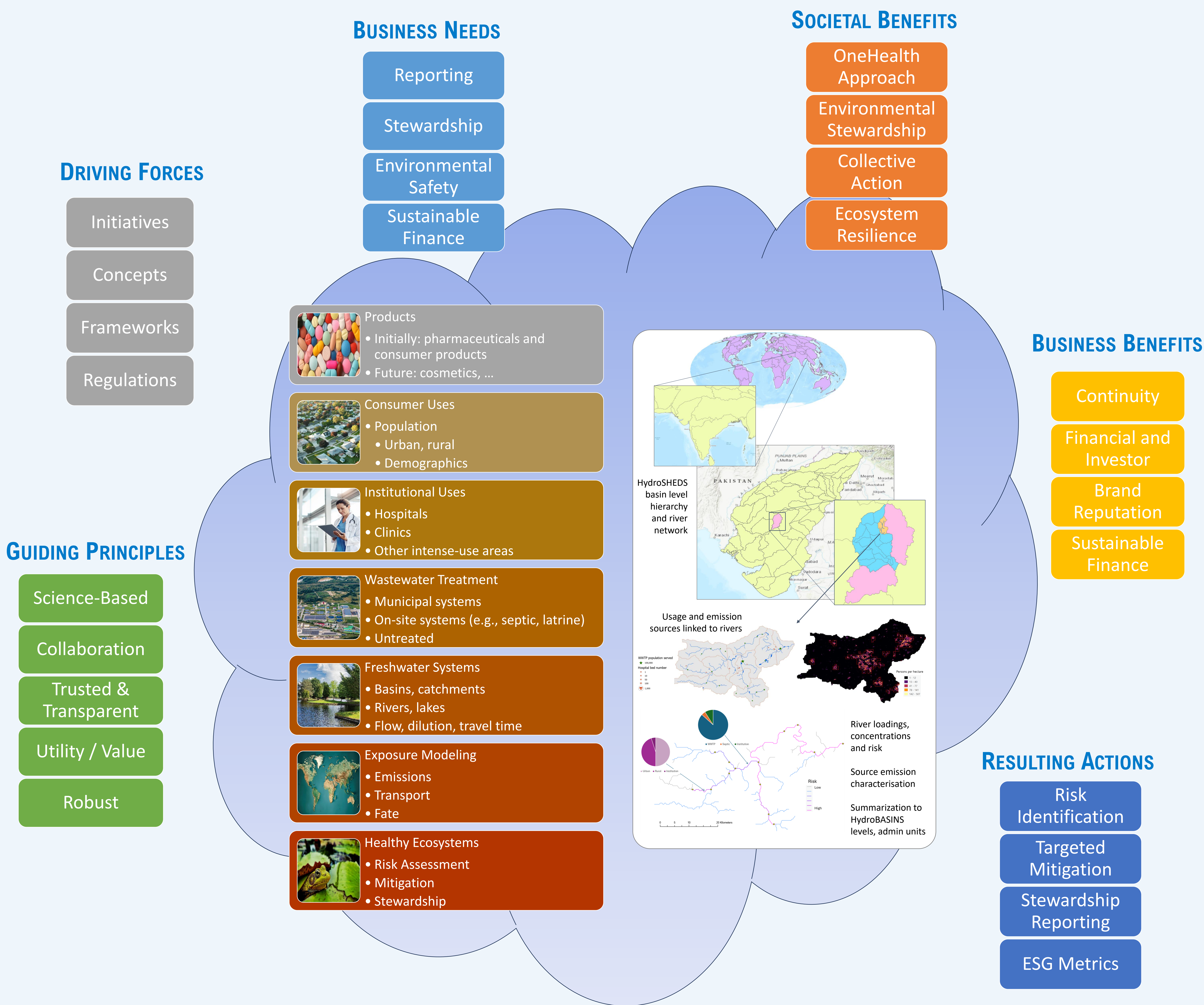
In today's interconnected world, freshwater systems serve as pathways and sinks for pollutants. **It is vital that we are better able to predict and mitigate the movement of chemicals into surface water**, so we can act to ensure they remain within safe limits.

The pharmaceutical industry faces scrutiny regarding the environmental impact of APIs that can enter water systems from both manufacture and patient use. Consumer care and cosmetics companies must be aware of the eventual emissions and potential impacts of ingredients after product use by customers. **Mapping of detailed water network emissions empowers companies to predict the distribution of APIs and ingredients in various aquatic ecosystems**. This prediction helps in developing robust environmental risk assessments and management plans ensuring readiness for increased regulations and mandatory disclosure.

Currently, there is a lack of comprehensive, consistent and functional data on how chemicals impact freshwater systems at a global level. A missing component is the ability to predict the global exposure of chemicals based on their usage variability and substance characteristics. **The development of a globally consistent, spatially explicit freshwater exposure model for down-the-drain substances is key** to enabling the first step on this journey.

Whether mitigating pollution, ensuring compliance, optimizing resource management, or protecting ecosystems, **trusted and transparent maps and predictive tools** are indispensable for businesses committed to operating responsibly in an evolving global landscape. **We call on others to join us in this endeavor**, investing in the development of science-led tools to predict issues adversely affecting water quality, enabling effective and efficient stewardship of the planet's precious water resources.

WE ARE DEVELOPING A SPATIALLY EXPLICIT GLOBAL MODEL TO ASSESS ENVIRONMENTAL EXPOSURE OF CHEMICALS AND ARE INVITING OTHERS TO JOIN US IN DEVELOPMENT OF SCIENCE-LED TOOLS TO PREDICT ISSUES ADVERSELY AFFECTING WATER QUALITY



Contact Tom Austin at Haleon (tom.j.austin@haleon.com), Stewart Owen at AstraZeneca (stewart.owen@astrazeneca.com), or Chris Holmes at Applied Analysis Solutions (chrisholmes@appliedanalysis.solutions) to discuss our efforts and your involvement