

Claims

1. A method of managing water risk comprising:
 - (a) receiving optical signals scattered by a microorganism particle in the fluid; said optical signals comprising a forward scattering pattern;
 - (b) characterizing the microorganism particle into one of a plurality of categories based on the forward scattering pattern using a classifier that employs a machine learning algorithm;
 - (c) updating a record data representing the number of microorganism particles of the plurality of categories;
 - (d) determining a risk level based on the record data;
 - (e) comparing the risk level to a reference level; and
 - (f) depending on the result of the comparison, producing a warning signal indicating an elevated risk of pathogens in the fluid

wherein the machine learning algorithm extracts features of the detected optical signals of the particles, assigns the respective particles into respective categories based on the features, and forms a database based on the features,

wherein the machine learning algorithm includes at least one parameter chosen from: image quality, statistical evaluation, radiometric correction, geometric correction, image enhancement and sharpening, phase correlation, and rotational and scale parameter, and

wherein the database includes both forward scattering signatures and side scattering signatures.
2. A fluid risk management system comprising a computer processor and a data storage device, the data storage device storing instructions operative by the processor to cause the processor to perform the method of claim 1.