



## “Environmental Innovation in the Offshore”

**Abstract:** Dr. David Risk, St. Francis Xavier University

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### ***Fiber Optical Sensor to Detect Dissolved Gases in Aqueous Environments***

(D. Risk, S. Bhatia, L. Melo, G. Burton, B. Davies, P. Wild)

Fibre-optic technology has been used successfully for leak monitoring in the oil and gas sector. Fiber is preferred whenever possible for harsh condition distributed deployments because sensing elements can be very durable and do not require power. Furthermore, fiber allows for long distance signal transmission and distributed sensing over a wide area. Modern fiber optical sensors for leak detection do not measure gases directly, but simply infer presence of leakage via temperature or sound anomalies, and thus cannot estimate concentrations in the area of impact. A novel direct sensing refractive-index gas composition sensor is described here, based on long period gratings with a high refractive index coating, for use in direct monitoring of gas concentrations in aquatic environments. Current research is investigating the effects of biofouling on sensor performance and lifetime, enhancement of gas selectivity through coatings, and protective encapsulation for shallow marine environments representative of the Scotian shelf. This presentation will summarize these ongoing efforts, achievements to date, and test deployments in shallow waters planned for the summer of 2014.