Cost Comparison for YSI Rapid Pulse™ and ROX™ Dissolved Oxygen Sensors

The model below illustrates how the ROX optical sensor technology can result in significant savings of time and money required to maintain and deploy *in situ* sensors for long-term monitoring applications. The assumptions may not apply exactly to every situation; however, we have chosen conservative figures to create a general model that should be relevant to most monitoring programs.

For monitoring groups, the most important benefit of using optical sensor technology is the time saved, which can be used instead to expand a monitoring program without increasing headcount. YSI's ROX sensor is also significantly less susceptible to being damaged while in the field, further saving time by decreasing the number of unplanned trips to the field for sensor maintenance.

Rapid Pulse		Operating Cost/1 Probe	Operating Cost/5 Probes	Labor/1 Probe
Polarographic DO sensor		x1	x5	
Membrane kit		2/year	2/year	
Reconditioning kit		2/year	10/year	
Reconditioning labor per probe	20min./deployment	$114	$570	6 hours
Deployment length	2 weeks			
Deployment site visit cost (boat + labor)	$552 – 1 site $952 – 5 sites	$9,936 (18 trips/season)	$17,136 (18 trips/season)	72 hours
Total		**$10,050**	**$17,706**	**78 hours**
ROX		Operating Cost/1 Probe	Operating Cost/5 Probes	Labor/1 Probe
Optical DO sensor		x1	x5	
ROX membrane replacement		x1	x5	
Reconditioning labor per probe	5 min.	$2	$8	5 min
Deployment length	6 weeks			
Deployment site visit cost (boat + labor)	$552 – 1 site $952 – 5 sites	$3,312 (6 trips/season)	$5,712 (6 trips/season)	24 hours
Total		**$3,314**	**$5,720**	**24.1**
Savings per ROX		**$6,736**	**$11,986**	**53.9 hours**

Assumptions:

- Costs for individual sensors and membranes vary by region. On average, initial cost of ROX sensor is greater than Rapid Pulse sensor, while lifetime labor and replacement parts are greater for Rapid Pulse.
- 9-month (36-week) field season.
- Sonde with Rapid Pulse sensor requires membrane changes and maintenance every 2 weeks in a productive environment.
- Sonde with ROX sensor can be deployed for at least 6 weeks without maintenance in a productive environment.
- During field season, Rapid Pulse requires 18 site visits while ROX requires 6 site visits.
- Rapid Pulse requires 2 membrane kits and 2 reconditioning kits per season.
- ROX requires 1 membrane change per season.
- Trip to field includes 2 people and 1 small vessel:
    - 4 hours to visit one station, 8 hours to visit 5 stations
    - Labor cost = $19/hour, or $152/site visit.
    - Vessel cost = $100/hr, or $400/site and $800/5 stations
- Annual labor includes reconditioning and trips to field.