



NITROX DIVING SAFETY:

Project Dive Exploration 1995-2008

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Project Dive Exploration Goals

- Record depth-time profiles with dive computers

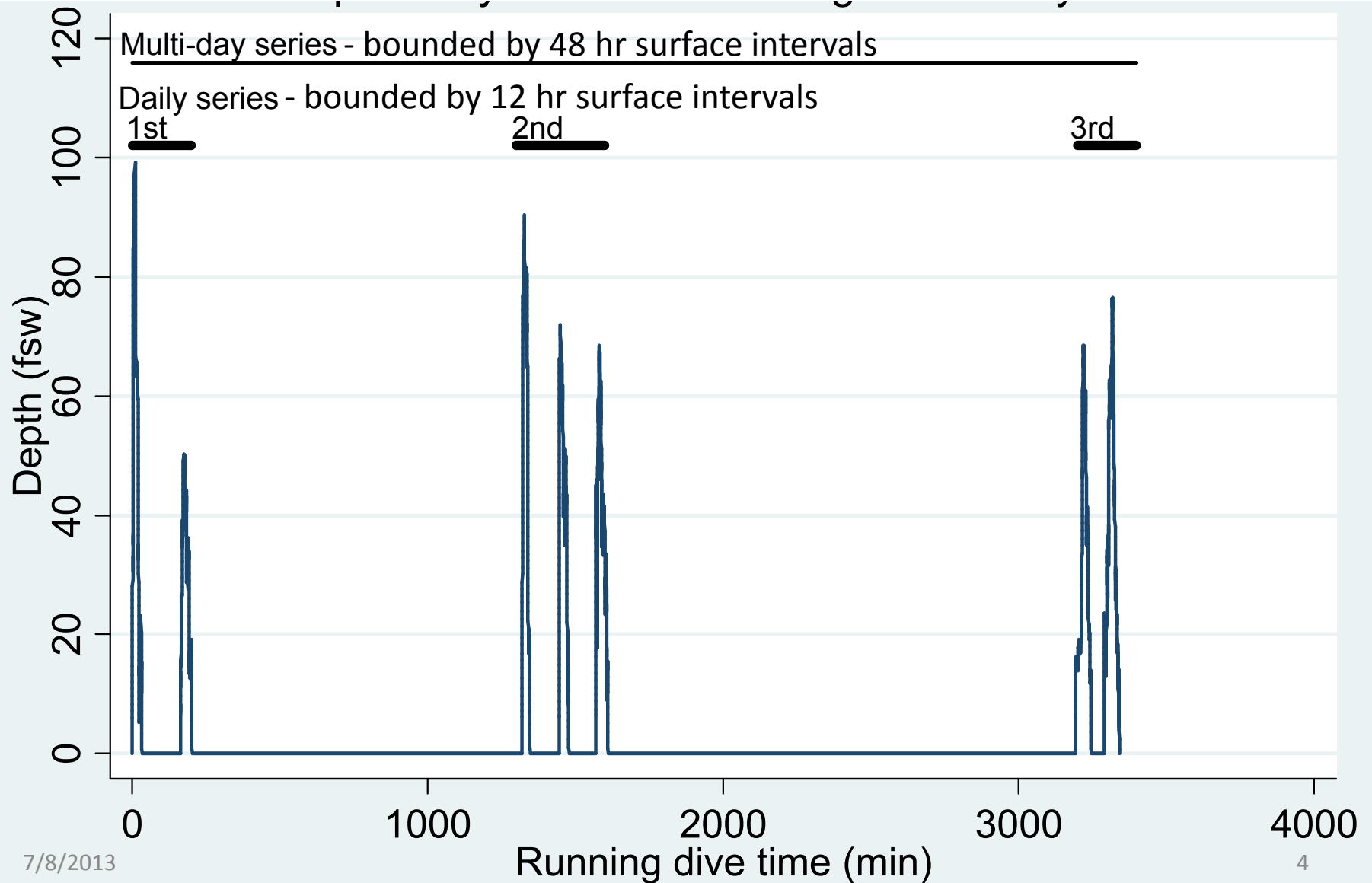


- Investigate
 - DCS incidences at various dive sites
 - Relationship of DCS probability to dive site & depth-time-gas exposure
 - Relative safety of nitrox and air dives

Dive Sites

- Basic
 - Caribbean live-aboards
 - Shore/dayboats
- Occupational
 - Cozumel dive guides
- Advanced
 - Scapa Flow wreck dives

Multiday Repetitive Dive Series

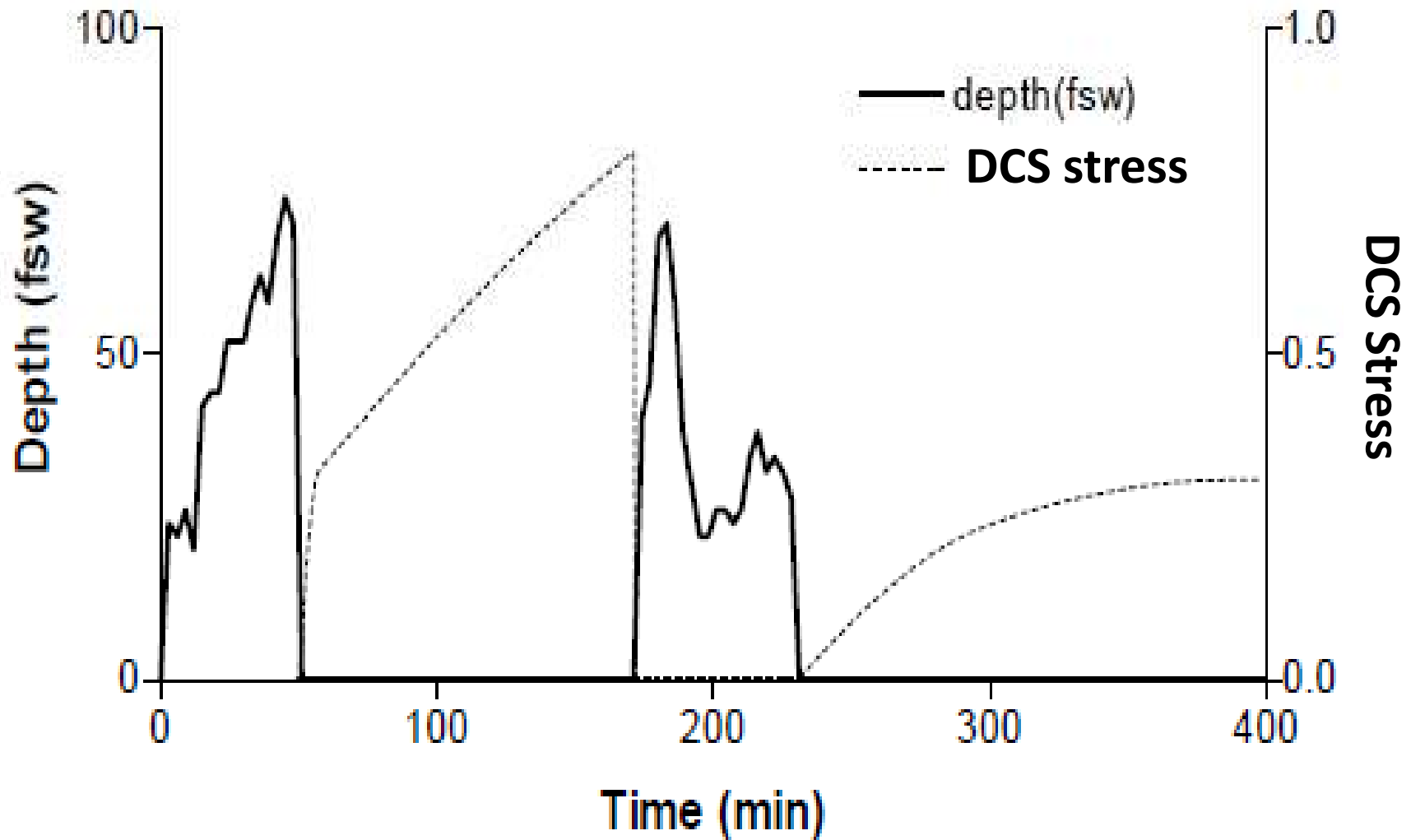


DCS Stress

Gerth & Vann. *UHM* 1997; 24(4):275-292.

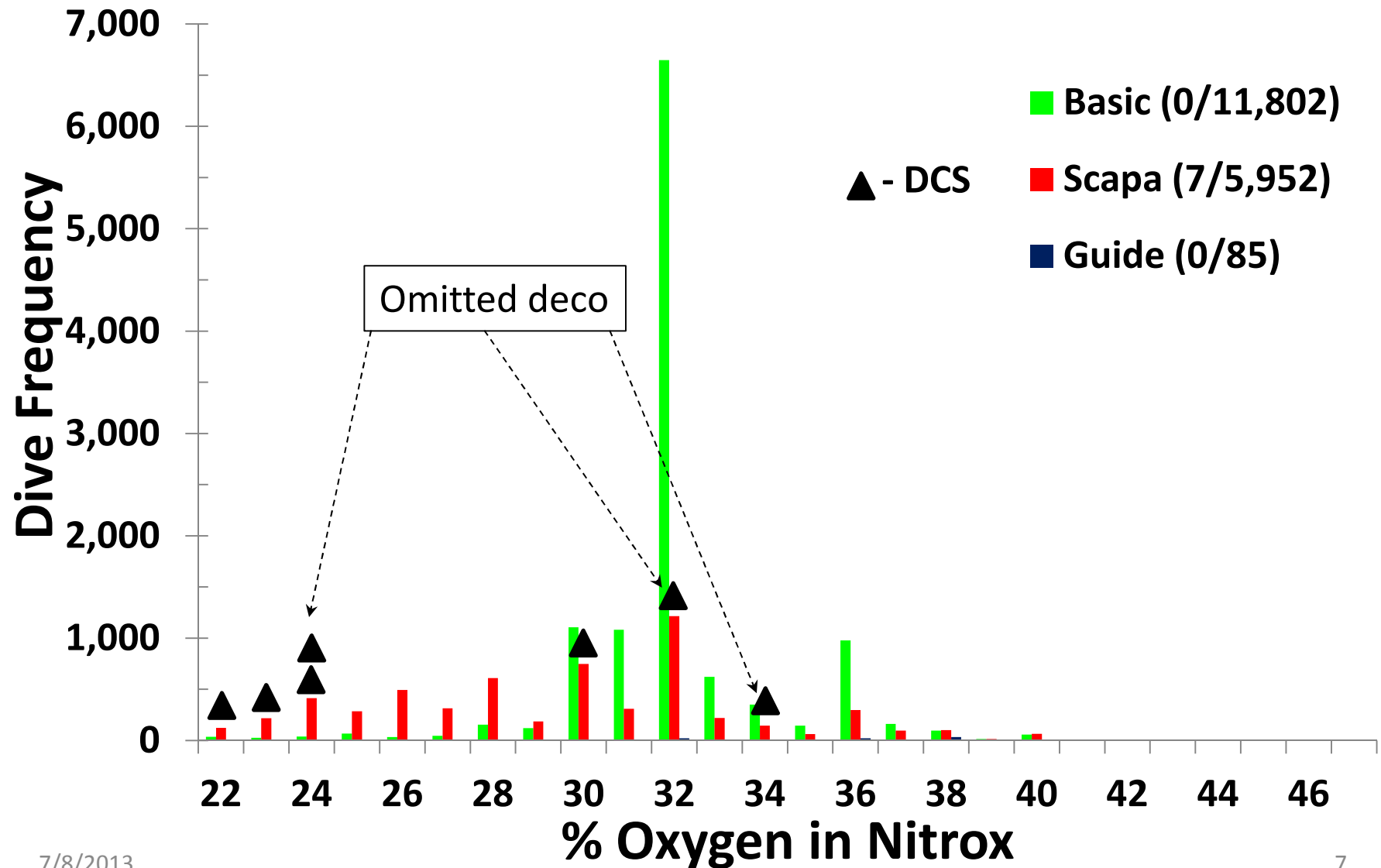
- DCS stress is a relative measure of DCS probability that allows dives to be ordered by decompression severity
- Based on a probabilistic decompression model of extravascular bubbles calibrated with 190 DCS cases in 3,322 Navy dive trials

DCS Stress & Repetitive Diving



Dunford et al. UHM 2002; 29(4):247-259.

O₂ in Nitrox Distribution



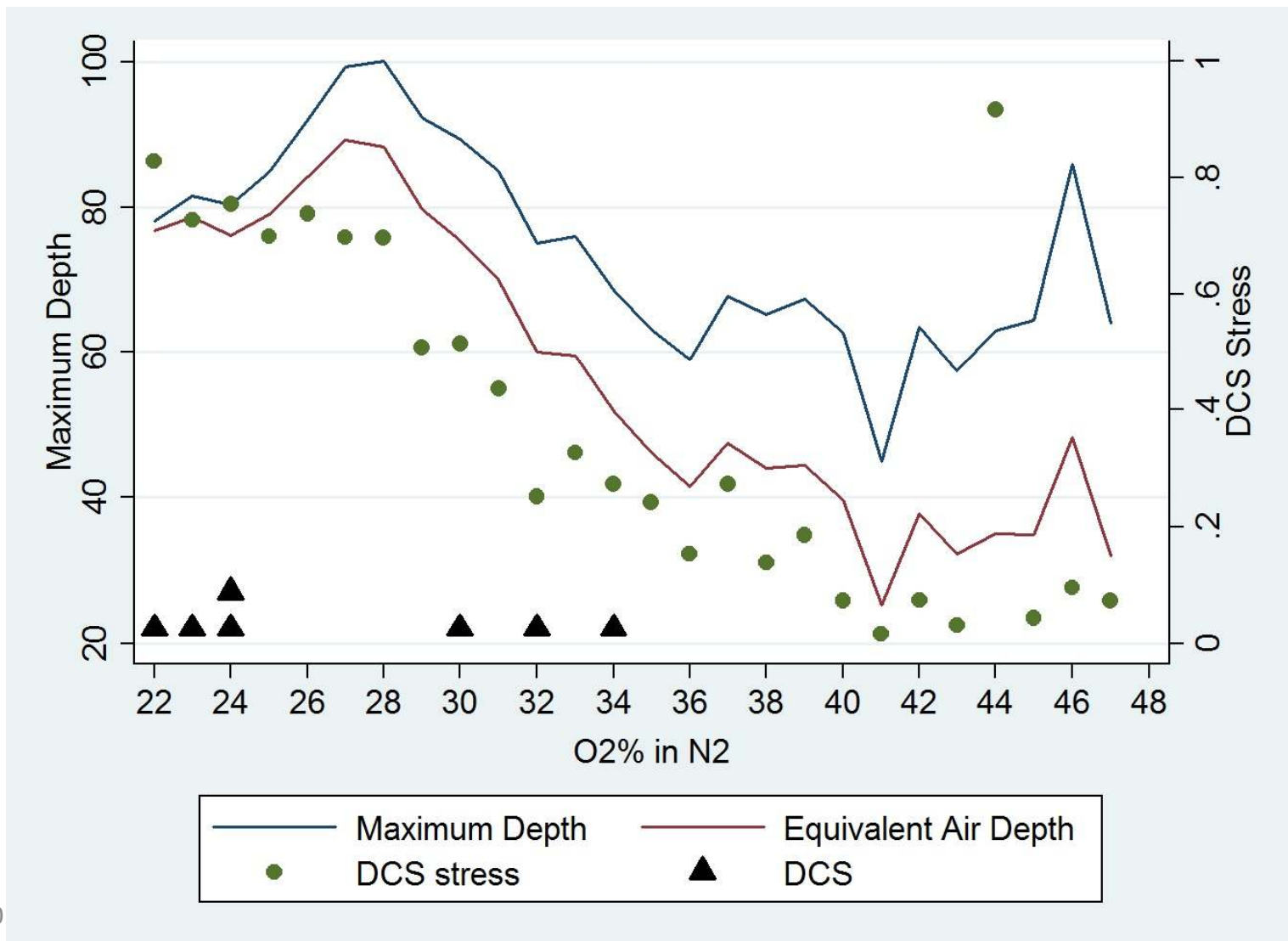
Air vs. Nitrox

<u>%O₂</u>	<u>#DCS</u>	<u>#Dives</u>	<u>DCS/10K</u>	Max <u>Depth</u>	Dive <u>Time</u>	DCS <u>Stress</u>
21 (air)	31	104,700	3.0*	66	47.2	0.48
26.1	4	3,167	12.6	91	43.3	0.70
32.5	3	14,687	2.0*	76	46.5	0.29

* not significant

- No difference in DCS incidence for air vs. 32.5% O₂
- Significantly higher DCS incidence for 26.1% O₂ than for air or 32.5% O₂
- Deeper dives for 32.5% O₂ than for air
- Deeper dives for 26.1% O₂ than for 32.5% O₂
- Lowest DCS stress for 32.5% O₂, highest stress for 26.1% O₂

% O₂ vs. Depth, EAD & DCS Stress



Summary

- Nitrox diving is as safe as air diving for 32% O₂
- Divers use nitrox for deeper rather than longer dives
- 26.1% O₂ had the greatest DCS incidence, depth & DCS stress
- For “Advanced” diving (Scapa Flow), the DCS risk might be reduced by more nitrox, shorter dives, more deco & higher O₂ % nitrox