

Diving Equipment Selection = FIT & COMFORT

Disclaimer: The following are recommendations from divers with many years of experience and do not reflect those of UCSC or the UC Regents, nor do they recommend any specific brands.

Rodale's Scuba Diving magazine has great equipment articles, which provide much more information than what is described here. <http://www.scubadiving.com/>

Exposure Suits

As you cannot swim off and warm up when working as a scientific diver you need to be warm. Being cold is unsafe and uncomfortable. The extra cost of a custom suit spread over the life of the suit is well worth the investment. We suggest a custom wetsuit "skin-in" (you will need to use powder or dilute hair conditioner to get into it), 3/8" (10mm) Farmer John bottom, 3/8" or 1/4" (7mm) jacket with hood attached – a good fit, thick rubber and an attached hood will make you a happy diver. You should add a pocket or two to the legs of the farmer john. Below are two local companies that make this type of suit which start at around \$650. Hair conditioner on your hair makes it easier to get in and out any suit. From what we have seen semi-dry suits are the worst of both wet/dry suits and inadequate for scientific diving, here in Monterey.

Deep Thought – 805.294.0013 (10mm Custom Suit) or for Non-Custom 10mm:

<https://www.scubastore.com/scuba-diving/suits-apnea/12494/s>

If you have or get a drysuit be sure you get training where you purchased the suit before taking the scientific diving course – we need to see some proof of training or you will not be able to use the suit in the class. While these suits will keep you warmer than a wetsuit they are not always practical in science diving use. You can easily over-heat in them when launching a boat and it is challenging to relieve yourself during a long day of diving. Contact the Diving Safety Office if you have any questions as there are lots of styles and choices on the market today.

Hand Protection

Several ideas here - from thick to thin gloves. You want to wear as much hand protection as will let you write underwater on your data sheet, so there is a compromise. You also do not want the gloves too tight – any restriction of circulation will dramatically increase cooling of the fingers. Typically, divers wear 5mm gloves but some will cut off the last knuckle of the index and thumb of their writing hand so as to provide plenty of dexterity while still keeping the hands warm. Some divers will wear 1.5mm surfing gloves, which actually keep your hands fairly warm and allow good dexterity. Some coat the fingertips of their hand protection with tool dip along with the snipping at the first knuckle to dramatically increase the life of their hand protection.

Booties

The thicker the better. Skin-in, slip on (no zippers), 10mm (3/8") booties are the answer to cold feet – Deep Thought makes them. Not only do they keep your feet warm but they eliminate bootie odor too. Using powder to get them on will prevent your feet sliding around as will happen if you use conditioner. Hard rubber soles and rubber on the top of the toes will add life to any bootie. Have your booties when you buy your fins to make sure they fit together.

Fins

Fins must match your size and leg strength. Be sure the foot pocket fits your foot with your booties on. Too snug and your feet will cramp, plus they will be difficult to get on and off. Too loose and you lose power and may get blisters. Stiff fins will cause cramps, too soft and they will "fold" over and be inefficient. Fins that float do not kick well on surface swims. Be sure the attachment clips can be worked with your "gloved" hands, won't catch kelp and are durable and easily replaced. We strongly suggest stainless steel spring straps – these allow your fins to go on and off easily, will never fail and don't get caught in kelp. You can get spring straps for most fins now. An easy measure for fin length is they should go from you heel to knee when held alongside you. See Rodale's for fin evaluations.

Snorkels

Larger diameter snorkels breathe easier but may be more difficult to clear. The more complex the snorkel the more likely it is to fail, although it should be easier to clear. A stiff top is good so it isn't bent when you need to breathe from it. Make sure the swivel connections do not come apart easily. Use an old-fashioned snorkel keeper if you want to keep your snorkel, as often "clips" aren't as secure. The snorkel should not wobble when you swim!

Masks

Fit and comfort is key. Lower volume masks are easier to clear, have less drag and are less likely to get pulled from your face. Compare field of view on fixed objects in the shop before buying. The closer the glass plate is to your face the better the field of view but be sure it doesn't rub the bridge of your nose or your forehead. Side view and bottom view prisms can help with that closed in feeling and may help you see the gear in front of you, but typically have a larger

volume. Clear silicone lets in more light but may add reflections. Bring your dive gloves to be sure you can grab the nose easily. Check the strap holders for ease of adjustment. Be sure straps stay set and adjusting mechanism is durable. We strongly recommend a neoprene mask strap – easy to put on and they rarely fail as do the silicone straps.

Regulators

1st stages: Diaphragm first stages don't allow water in and generally need less maintenance, but potentially have more parts to replace. Piston first stages do let water in and will need more maintenance especially in silty water, but they do provide higher gas flow rates. You should make sure you purchase a balanced first stage – unbalanced is cheaper but may be more difficult to breath from when your cylinder has less pressure.

2nd stages: Smaller mouthpieces and lighter weight regs can be more comfortable. You don't need to pay extra for a balanced second stage or an adjustable second stage, spend that money on your exposure suit.

Alternate air sources:

Typically, divers have an “octopus” which is similar to their primary second stage. If you are using an “octopus” make sure you have a restraint system for it so you know where it is at all times and it should be able to be easily removed from the restraint in an emergency.

Integrated air supply devices combine the bc power inflator and a second stage in one unit. This system allows you to streamline your equipment by losing a low-pressure hose that would have gone to your “octopus”. However, these units tend to be more temperamental than an “octopus” so there is a compromise. They also tend to have unique low pressure quick connects so you won't be able to use your bc hose with standard bc inflators.

Independent systems such as a Spare Air or pony bottle are not recommended due to the added bulk they add to your system and increased risk of entanglement by kelp.

The UCSC Diving Program is authorized to work on only certain brands of regulators (Mares, Aqualung, Scubapro, Atomic). All brands must be serviced at regular intervals as stipulated by the manufacturer – some provide free parts for the life of the regulator, something to keep in mind as you make your purchase, this can save you lots of money over the life the equipment.

- Have all used regulators, BCs and cylinders checked by a qualified technician before buying them.

Gauges

All gauges should be easily read under low light conditions. Gauge increments should make sense at a glance – if you have to stop and figure out how to read your gauge every time you look at it, it's not right. This goes for pressure gauges, compasses, timing devices and depth gauges. If your gauges have any buttons, thumb screws or bezels make sure you can operate them with your gloves on. A console is the best way to organize your gauges, all your information at a glance – make sure you have a way to restrain it so it doesn't hang down and get caught.

Dive Computers

Air integrated computers give you a smaller instrument package and give you air consumption information. However, when they fail you lose not only depth and time but how much air you have left. The hose-less varieties eliminate your HP hose but sometimes can be buggy when around other electronic gear (sonar, strobes, DPVs). Things to look for: nitrox capable, downloadable to a PC, programmable for diver preferences, backlighting, number of dives stored in the logbook...

The UCSC Diving Program does have Suunto Vypers that can be loaned out for the class. If you are short on funds, instead of buying a computer borrow one from us and use your money to buy a good exposure suit.

Cutting Device / Light

Your cutting device should be fairly small to be used to cut lines or sharpen your pencil. And it should have a secure sheath that can easily be opened with a gloved hand and that can securely be attached to your body or bc. Shears work well, just a bit more difficult to use to sharpen your pencil. Lights, depending on the application, do not have to be large. Smaller ones that can be placed in your bc pocket are good. Headlamps can also work, especially if you need to use both of your hands – however attachment is tricky and mask removal even more so. Any lanyard should be stretchy, not nylon cord – you want to be able to pull free from your light if it gets caught.

Buoyancy Compensators

The fewer straps the better – narrow and no cummerbunds. The closer to the cylinder the bottom of the shoulder strap attaches, the closer the cylinder will be to you (this is good). If weight integrated BCs are used, the weights should come out and go in easily every dive. Put on the BC with a cylinder and your regulator, while wearing your hand protection to check fit, valve access, and hose lengths. The amount of lift (volume) you will need depends on your size and the types

of diving you plan on doing. Your BC is for your buoyancy control, not to lift other items. You will have to decide between single and double bag construction, size and backpack type. Checkout back mount BCs, as there is less in your way in front of you, which is key when working underwater. We strongly recommend a double bag, back inflate wing with a backplate (either stainless steel or aluminum). The stainless steel backplate allows you to add weight to your system without adding it to your weight belt – especially important when using a drysuit or 10mm wetsuit.

Weight systems

Hard hip weights stay in place and take up minimal space on your belt. Women may find hip weights uncomfortable though. Soft weights may be more comfortable. Harness weightbelts transfer weight from hips to shoulders and weight carried can be easily adjusted. Ankle weights can remove some weight from your hips. You can put some weight on your tank or in your BC too. Distributing weight for proper trim is key. Easily adjusting weight for different depth dives and aluminum vs. steel cylinders is also important. Your weight system should never be more than 15% of your body weight. Brass clips on weight belts are great for attaching gear bags and tools. If you have a block lead weight belt you must have weight keepers on it to keep the weights from falling off. We strongly recommend harness systems and tend to discourage weight integrated bc systems.

"Goody" bags

Mesh "goody" bags are great for organizing and carrying your dive gear on a small boat. The opening should be metal (not drawstring) and the bag large enough to hold your fins, mask, gloves, BC and sampling gear (slate, etc.).

Save-A-Dive Kit

Everyone will have to put together, or buy a pre-made, save-a-dive kit. The kit should include at a minimum: mask straps, fin straps, snorkel keepers, tank o-rings, regulator mouthpiece, computer battery, dive light batteries and zip ties. Of course, you can add to this as you see fit. In terms of tools you can purchase the Scuba Tool, which contains most everything you should need. Make sure the mask and fin straps work with your buckling system.

Action Packers (24 gal) made by Rubbermaid make great gear carriers, protecting your gear, keeping your vehicle dry and providing a rinse "bucket" to clean your gear.