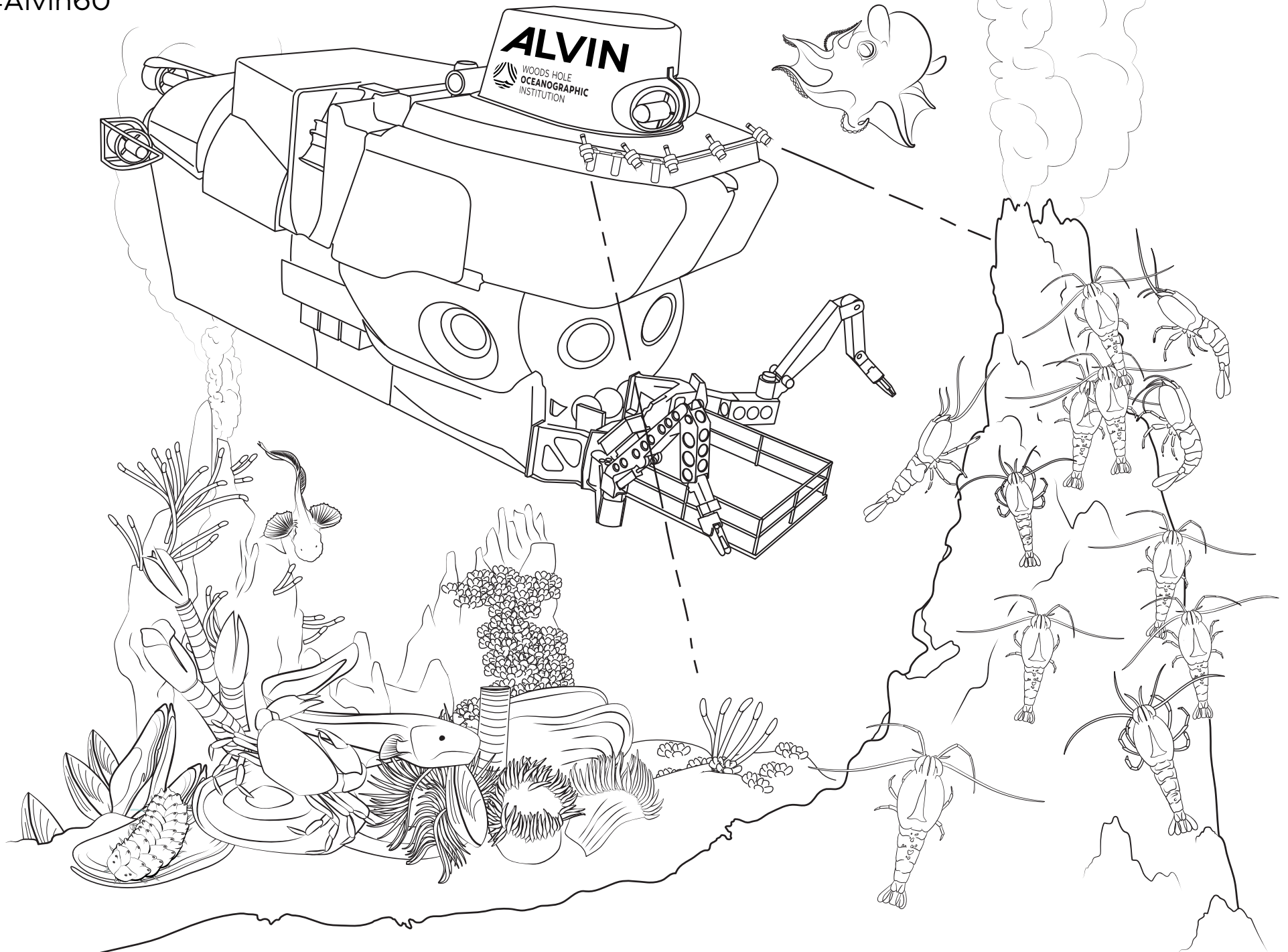


#Alvin60



WOODS HOLE OCEANOGRAPHIC INSTITUTION

whoi.edu

COLOR THE OCEAN: *Alvin* explores vents

Meet *Alvin*, the deepest-diving, human-occupied, science submarine in the United States!

Since 1964 scientists in *Alvin* have documented the alien landscapes at hydrothermal vents, explored the RMS Titanic, discovered hundreds of deep sea-creatures, and brought back reels of stunning video.

Between 2011 and 2022, *Alvin* was completely rebuilt and certified by the U.S. Navy to dive to 6,500 meters (almost four miles deep), meaning it can now reach 99% of the seafloor.

Yes, you read that right, this storied sub is practically brand new. **At 60 *Alvin* is just getting started.**

To learn more visit:

whoi.edu/alvin60

Share your creations on social media and be sure to tag us!

#Alvin60



Hydrothermal vents

In 1979, scientists in *Alvin* visited the seafloor near the Galapagos Islands, where they found clouds of what looked like black smoke billowing from tall chimneys. They also found dozens of previously unknown organisms thriving in the hot, chemical-rich water and perpetual darkness. These discoveries fundamentally changed our understanding of life on Earth.

Hydrothermal vents and their low-temperature cousins, cold seeps, form in many places on the seafloor. Water flows down through cracks and is heated by hot rock deep below, sometimes to more than 400°C (750°F). The hot fluid reacts with minerals in the rocks and rises back to the surface, gushing or gently flowing from the seafloor.

Hydrothermal fluid contains dissolved metals or other chemicals that feed microbes through a process called chemosynthesis. These microbes form the base of the food chain at hydrothermal vents and seeps and support a wide range of other life, including tubeworms, shrimp, and mussels—much as photosynthesis in plants and algae kickstarts the food chain on the sunlit surface. Scientists now think that, if ocean worlds like Europa or Enceladus have hydrothermal systems, we stand a good chance of also finding life there.

Identify and color the following within the scene:

- Hydrothermal vent chimney
- Snailfish Family *Laparidae*
- (Human Occupied Vehicle) HOV *Alvin*
- Giant tube worm *Riftia pachyptila*
- Vent mussel *Bathymodiolus* spp.
- Vent scale worm Family *Polynoidae*
- Anemone Family *Actinostolidae*
- Giant white clam *Calyptogenia magnifica*
- Dumbo octopus *Grimnoteuthis* sp.
- Pink vent fish Family *Zoarcidae*
- Vent crab *Bythograea* spp.
- Blind shrimp *Rimicaris exoculata*

Woods Hole Oceanographic Institution (WHOI) is a place where scientists, engineers, students, and many others come together to solve difficult problems and to learn more about the ocean. At any given time, WHOI researchers are leading over 800 projects in the lab, in the field, on shore, and at sea to help leaders around the world make decisions that will sustain our ocean planet. We tackle the most pressing issues of our time by championing ocean exploration, education, research, and awareness. And we do this for our ocean, our planet, our future.