Selection from:
Jungar, Sebastian. *The Perfect Storm.*

Whether the *Andrea Gail* rolls, pitch-poles, or gets driven down, she winds up, one way or another, in a position from which she cannot recover. Among marine architects this is known as the zero-moment point—the point of no return. The transition from crisis to catastrophe is fast, probably under a minute, or someone would’ve tripped the EPIRB. (In fact the EPIRB doesn’t even signal when it hits the water, which means it has somehow malfunctioned. In the vast majority of cases, the Coast Guard knows when men are dying offshore.) There’s no time to put on survival suits or grab a life vest; the boat’s moving through the most extreme motion of her life and there isn’t even time to shout. The refrigerator comes out of the wall and crashes across the galley. Dirty dishes cascade out of the sink. The T.V., the washing machine, the VCR tapes, the men, all go flying. And, seconds later, the water moves in.

When a boat floods, the first thing that happens is that her electrical system shorts out. The lights go off, and for a few moments the only illumination is the frenetic blue of sparks arcing down into the water. It’s said that people in extreme situations perceive things in distorted, almost surreal ways, and when the wires start to crackle and burn, perhaps one of the crew thinks of fireworks—of the last Fourth of July, walking around Gloucester with his girlfriend and watching colors blossom over the inner harbor. There’d be tourists shuffling down Rogers Street and fishermen hooting from bars and the smell of gunpowder and fried clams drifting through town. He’d have his whole life ahead of him, that July evening; he’d have every choice in the world.

And he wound up swordfishing. He wound up, by one route or another, on this trip, in this storm, with this boat filling up with water and one or two minutes left to live. There’s no going back now, no rescue helicopter that could possibly save him. All that’s left is to hope it’s over fast.

When the water first hits the trapped men, it’s cold but not paralyzing, around 52 degree. A man can survive up to four hours in that temperature if something holds him up. If the boat rolls or flips over, the men in the wheelhouse are the first to drown. Their experience is exactly like Hazard’s except that they don’t make it out of the wheelhouse to a life raft; they inhale and that’s it. After that the water rises up the companionway, flooding the galley and berths, and then starts up the inverted engine room hatch. It may well be pouring in the aft door and the fish hatch, too, if either failed during the sinking. If the boat is hull-up and there are men in the engine room, they are the last to die. They’re in absolute darkness, under a landslide of tools and gear, the water rising up the companionway and the roar of the waves probably very muted through the hull. If the water takes long enough, they might attempt to escape on a lungful of air—down the companionway, along the hall, through the aft door and out from under the boat—but they don’t make it. It’s too far, they die trying. Or the water comes up so hard and fast that they can’t even think. They’re up to their waists and then their chests and then their chins and then there’s no air at all. Just what’s in their lungs, a minute’s worth or so.

The instinct not to breathe underwater is so strong that it overcomes the agony of running out of air. No matter how desperate the drowning person is, he doesn’t inhale until he’s on the verge of losing consciousness. At that point there’s so much carbon dioxide in the blood, and so little oxygen, that chemical sensors in the brain trigger an involuntary breath whether he’s underwater or not. That is called the “break point”; laboratory experiments have shown the break point to come after 87 seconds. It’s a sort of neurological optimism, as
if the body were saying, *Holding our breath is killing us, and breathing in might not kill us, so we might as well breathe in.* If the person hyperventilates first—as free divers do, and as a frantic person might—the break point comes as late as 140 seconds. Hyperventilation initially flushes carbon dioxide out of the system, so it takes that much longer to climb back up to critical levels.

Until the break point, a drowning person is said to be undergoing “voluntary apnea,” choosing not to breathe. Lack of oxygen to the brain causes a sensation of darkness closing in from all sides, as in a camera aperture stopping down. The panic of a drowning person is mixed with an odd incredulity that this is actually happening. Having never done it before, the body—and the mind—do not know how to die gracefully. The process is filled with desperation and awkwardness. “So this is drowning,” a drowning person might think. “So this is how my life finally ends.”

Along with the disbelief is an overwhelming sense of being wrenched from life at the most banal, inopportune moment imaginable. “I can’t die, I have tickets to next week’s game,” is not an impossible thought for someone who is drowning. The drowning person may even feel embarrassed, as if he’s squandered a great fortune. He has an image of people shaking their heads over his dying so senselessly. The drowning person may feel as if it’s the last, greatest act of stupidity in his life.

These thoughts shirk through the mind during the minute or so that it takes a panicked person to run out of air. When the first involuntary breath occurs most people are still conscious, which is unfortunate, because the only thing more unpleasant than running out of air is breathing in water. At that point the person goes from voluntary to involuntary apnea, and the drowning begins in earnest. A spasmodic breath drags water into the mouth and windpipe, and then one of two things happen. In about ten percent of people, water—anything—touching the vocal cords triggers an immediate contraction in the muscles around the larynx. In effect, the central nervous system judges something in the voice box to be more of a threat than low oxygen levels in the blood, and acts accordingly. This is called a laryngospasm. It’s so powerful that it overcomes the breathing reflex and eventually suffocates the person. A person with laryngospasm drowns without any water in his lungs.

In the other ninety percent of people, water floods the lungs and ends any waning transfer of oxygen to the blood. The clock is running down now; half-conscious and enfeebled by oxygen depletion, the person is in no position to fight his way back up to the surface. The very process of drowning makes it harder and harder not to drown, an exponential disaster curve similar to that of a sinking boat.

Occasionally someone makes it back from this dark world, though, and it’s from these people that we know what drowning feels like. In 1892 a Scottish doctor named James Lowson was on a steamship bound for Colombo, Sri Lanka, when they ran into a typhoon and went down in the dead of night. Most of the 150 people on board sank with the ship, but Lowson managed to fight his way out of the hold and over the side. The ship sank out from under his feet, dragging him down, and the last thing he remembers is losing consciousness underwater. A few minutes later the buoyancy of his life vest shot him to the surface, though, and he washed up on an island and lived to write about his experiences in the *Edinburgh Medical Journal.* He attributed the clarity of his recollection to the “preternatural calm” of people facing death. It’s as close as one is going to get to the last moments of the *Andrea Gail.*

All afternoon the hammering of the big seas on the doomed vessel went on, whilst night came only to add darkness to our other horrors. Shortly before ten o’clock three tremendous seas found their way down the stokehole, putting out the fires, and our situation was desperate. The end came shortly before mid-
night, when there was a heavy crash on the reef, and the vessel was lying at the bottom of the Straits of Formosa in under a minute.

With scarcely time to think I pulled down the life-belts and, throwing two to my companions, tied the third on myself and bolted for the companionway. There was no time to spare for studying humanity at this juncture, but I can never forget the apparent want of initiative in all I passed. All the passengers seemed paralyzed—even my companions, some of them able military men. The stewards of the ship, uttering cries of despair and last farewells, blocked the entrance to the deck, and it was only by sheer force I was able to squeeze past them. Getting out on deck, a perfect mountain of water seemed to come from overhead, as well as from below, and dashed me against the bridge companionway. The ship was going down rapidly, and I was pulled down with her, struggling to extricate myself.

I got clear under water and immediately struck out to reach the surface, only to go farther down. This exertion was a serious waste of breath, and after ten or fifteen seconds the effort of inspiration could no longer be restrained. It seemed as if I was in a vice which was gradually being screwed up tight until it felt as if the sternum and spinal column must break. Many years ago my old teacher used to describe how painless and easy a death by drowning was—"like falling about in a green field in early summer"—and this flashed across my brain at the time. The "gulping" efforts became less frequent, and the pressure seemed unbearable, but gradually the pain seemed to ease up. I appeared to be in a pleasant dream, although I had enough will power to think of friends at home and the sight of the Grampians, familiar to me as a boy, that was brought into my view. Before losing consciousness the chest pain had completely disappeared and the sensation was actually pleasant.

When consciousness returned, I found myself at the surface, and managed to get a dozen good inspirations. Land was about four hundred yards distant, and I used a bale of silk and then a long wooden plank to assist me to shore. On landing, and getting behind a sheltering rock, no effort was required to produce copious emesis. After the excitement, sound sleep set in, and this sleep lasted three hours, when a profuse diarrhea came on, evidently brought on by the sea water ingested. Until morning broke all my muscles were in a constant tremor which could not be controlled. (Several weeks later) I was sleeping in a comfortable bed and, late in the evening, a nightmare led to my having a severe struggle with the bedroom furniture, finally taking a "header" out of the bed and coming to grief on the floor.

Lowson guesses that laryngospasm prevented water from entering his lungs when he was unconscious. The crew of the Andrea Gail either have laryngospasms or completely inundated lungs. They are suspended, open-eyed and unconscious, in the flooded enclosures of the boat. The darkness is absolute and the boat may already be on her way to the bottom. At this point only a massive amount of oxygen could save these men. They have suffered, at most, a minute or two. Their bodies, having imposed increasingly drastic measures to keep functioning, have finally started to shut down. Water in the lungs washes away a substance called surfactant, which enables the alvioli to leech oxygen out of the air. The alvioli themselves, grape-like clusters of membrane on the lung wall, collapse because blood cannot get through the pulmonary artery. The artery has constricted in an effort to shunt blood to areas of the lungs where there is more oxygen. Unfortunately, those don't exist. The heart labors under critically low levels of oxygen and starts to beat erratically—"like a bag full of worms," as one doctor says. This is called ventricular fibrillation. The more irregularly the heart beats, the less blood it moves and the faster life-functions decline. Children—who have proportionally stronger hearts than adults—can maintain a heartbeat for up to five minutes without air. Adults die faster. The heart beats less and less effectively until, after several minutes, there's no movement at all. Only the brain is alive.

The central nervous system does not know what has happened to the body; all it knows is that not enough oxygen is getting to the brain. Orders are still being issued—Breathe! Pump! Circulate!—that the body cannot obey. If the person
were defibrillated at that moment, he might possibly survive. He could be given cardiopulmonary resuscitation, put on a respirator, and coaxed back to life. Still, the body is doing everything it can to delay the inevitable. When cold water touches the face, an impulse travels along the trigeminal nerve to the central nervous system and lowers the metabolic rate. The pulse slows down and the blood pools where it's needed most, in the heart and skull. It's a sort of temporary hibernation that drastically reduces the body's need for oxygen. Nurses will splash ice water on the face of a person with a racing heart to trigger the same reaction.

The diving reflex, as this is called, is compounded by the general effect of cold temperature on tissue—it preserves it. All chemical reactions, and metabolic processes, become honey-slow, and the brain can get by on less than half the oxygen it normally requires. There are cases of people spending forty or fifty minutes under lake ice and surviving. The colder the water, the stronger the diving reflex, the slower the metabolic processes, and the longer the survival time. The crew of the *Andrea Gail* do not find themselves in particularly cold water, though; it may add five or ten minutes to their lives. And there is no one around to save them anyway. The electrical activity in their brain gets weaker and weaker until, after fifteen or twenty minutes, it ceases altogether.

The body could be likened to a crew that resorts to increasingly desperate measures to keep their vessel afloat. Eventually the last wire has shorted out, the last bit of decking has settled under the water. Tyne, Pierre, Sullivan, Moran, Murphy, and Shatford are dead.