Introduction

Landscapes tell stories, if we know how to listen. When Mount St. Helens erupted on May 18, 1980, the story most people heard seemed to be almost entirely about violence, danger, and devastation. But even as rescue efforts continued for the people missing on the mountain, scientists went up to the volcano looking for other stories. They wanted to see how the landscape would respond to these enormous disturbances, and they brought along some reasonable hypotheses. But much of what they saw and learned was so radically different from what they expected that their new findings have significantly changed several branches of ecology.

Writers and thinkers have a long history of regarding the mountain, as well. Since the eruption, they've been gauging the volcano's effects on the regional culture, wondering how these changes in the landscape will affect people's lives and imaginations.

What would happen, the editors of this volume asked, if we invited a group of scientists, writers, and other interesting people to go up to the mountain, to camp together for a few days, to share their particular kinds of knowledge, their informed perspectives on how the mountain had changed and how it had changed us? And what if we asked them each to write something that drew on both their expertise and their personal experiences, to consider what those changes might mean for how people live their lives? Would this help us to hear more kinds of stories about what it means to live in a volcanic landscape, in a world of constant change?

With those questions in mind, we proposed to host the Mount St. Helens Foray. We invited several forest ecologists, a couple of poets, a lepidopterist, a journalist, and a bryologist (a scientist who studies lichens and mosses); a singer/songwriter, a sociologist, a photographer, a stream ecologist, several writers of nature essays, and a writer of speculative fiction; also, a research ecologist who has spent most of his career—twenty-five years—doing field work almost exclusively at Mount St. Helens. (Biographical sketches of all the contributors may be found at the back of this volume.) We camped together on the mountain for four days in the summer of 2005, hiking, observing, reflecting, learning the ecology, sharing stories, insights, and ideas about the meanings of catastrophe, and about

sources of renewal. This book brings together essays and poems by many of those who participated in the Foray, and several pieces by other long-time Mount St. Helens watchers. Together, they suggest a few of the many promising ways of approaching the question: What can the radically altered landscapes of Mount St. Helens tell us about how to understand nature and how to live our lives?

The Eruption

For two months in the spring of 1980, magma shoved up under the north flank of Mount St. Helens. On a Sunday morning in May, a huge landslide broke loose the north side of the mountain and slid twelve miles down the Toutle River valley, burying more than twenty square miles under rock, mud, and broken forest. As the mountaintop collapsed, it uncorked a super-heated groundwater system that had built up within the volcano. A steam-driven blast shot out to the north, ripping away the forests closest to the vent. Farther away, the blast snapped off trees, toppling them in patterns that mapped the direction of the force. The heat seared forests as many as seventeen miles from the mountain, leaving a fringe of scorched trees, the standing dead.

Searing hot pyroclastic flows spewed from the crater mouth and built up at the northern foot of the volcano, leaving a broad, barren pumice plain. Massive mudflows raced down rivers that drained the volcano, some traveling seventy-five miles to the Columbia River. A cloud of tephra, gray volcanic ash, boiled into the atmosphere and rode the wind to the northeast. Ash darkened the day and rained from the sky over a vast area of eastern Washington and beyond.

The diverse volcanic processes utterly transformed Mount St. Helens' forests, meadows, lakes, and streams into a complex mosaic of new environments. Closest to the explosion, entirely new landscapes replaced the old: a volcanic crater over a mile wide, where once a summit had stood; new lakes, ponds, and streams on the debris avalanche and at its edges; and square miles of seemingly sterile new land surfaces. Farther from the volcano, as much as three feet of fragmented mountain top blanketed the killed forest and beds of lakes and streams. Even beyond the blast zone, cool tephra snowed onto the land, collecting on branches, blanketing the moss, lichens, and foliage.

Geological processes continue to compete to shape the new volcanic landscape. Intrusion of magma into the volcano led to its collapse, but ongoing magma flows soon began building new domes at the rate of several dump truck-loads of rock a minute. The giant landslide drowned entire rivers, but new rivers began to carve watercourses across the pumice plain. The landslide blocked tributary streams, forming new lakes and ponds, which filled and drained as rivers cut new outlets.

Mount St. Helens exhibits strong, startling tensions also between geological and ecological forces. Geological forces, such as the deposition of tephra and debris, may have buried an area and destroyed its plant and animal communities. But as these deposits are eroded, new landscapes may be created where plants and animals begin to thrive, whereupon ecological forces become more prominent. In some instances erosion prevents plant growth; in other cases plant growth suppresses erosion.

At first, ecologists were stunned by what looked like a gray, lifeless landscape. Their initial assumptions were that this "moonscape" would only very gradually recover and that species would colonize the disturbed landscapes from the edges inward. But these assumptions were soon disproved. On research missions to the volcano within days of the eruption, ecologists were astonished to find surviving plants and animals emerging from refuges in soil, rotten logs, snow banks, and ice-covered ponds. These biological legacies of the pre-eruption ecosystems profoundly affected the post-eruption landscape. Now, twenty-five years after the eruption, the volcanic landscape is a patchy pattern of what ecologists call "hotspots"—habitats favorable for plant community development—and "coldspots"—places of persistent erosion where no plants or animals have established a home. Different ecosystems have responded at dramatically different rates: lakes and steep meadows have adjusted rapidly, but centuries will elapse before old-growth forests shade the slopes again.

The Mount St. Helens landscape now also maps human responses to the volcanic eruption. The conflicts over forest land management that had bedeviled the region for decades emerged again on this new ground. In 1982, two years after the eruption, Congress passed the National Volcanic Monument Act to establish an 110,000-acre Monument where "geological forces and ecological succession

[can] continue substantially unimpeded." Outside the boundaries of the Monument, private industries and the Forest Service rapidly "salvage logged" the toppled and standing-dead forest and planted conifer seedlings. The boundary between the Monument and private land is sharp and clearly visible across the hillsides. Planted forests develop dense tree crops quickly, creating productive but simple monocultures, visible as a thick hatch of trees. Mount St. Helens Monument's unplanted hillslopes bloom with a wild profusion of tree, shrub, and herb species and a corresponding diversity of insects, amphibians, mammals, and birds.

What Does It Mean?

What is the meaning of the volcano-blasted mountain? When blue lupines colonize a pumice barrens, what might be learned about catastrophic change and the chance for renewal? What do we know that we didn't know before about being human in a volcanic landscape?

First came fear. Ash and stones falling from the sky. Sizzling rock pouring down riverbeds. Ponds boiling into clouds. Stones floating like ice on water. "A mountain not acting the way a mountain should," the writer and volcano-watcher John Calderazzo said. The sound: like the end of the world. But also the shiver, the thrill in this power, the blast that everyone who was paying attention knew was coming. Then, from his observation point a few miles north of the mountain, geologist David Johnston shouted into his radio, "Vancouver. Vancouver, this is it!" as the pent-up volcano let go.

Then came grief. There had been people on the mountain. Fifty-seven of them died, all with names and hopes and secrets. So did elk and deer, fish and birds, marmots and bears. Untold thousands of animals were killed. And the explosion was a loss for people who loved the mountain itself, people whose families gathered there year after year, rested in the shade of giant cedars, launched canoes that rippled the perfect reflection of the beautifully symmetrical peak. What would they make of the loss of the peace of this place? And what would comfort them, as they mourned the cedar groves blasted into ash, and Spirit Lake, a sacred place turned into something more like a pulpmill lagoon?

And twenty-five years later, exhilaration and hope. "There is such singing in the morning," the novelist Ursula Le Guin has written of the Mount St. Helens landscape today. And it's true. If you wake early on the mountain, you will hear white-crowned sparrows and frog choruses and maybe even a meadowlark. They will be flitting around a grove of fir saplings, or fussing in willows at the edge of a marsh where beavers have dammed a backwater pond. Lupine spread purple over pumice plains, where there are deer and elk and black bear. Children walk the trails to the lakes, lifting puffs of ash, releasing the sweetness of fir needles under their feet.

It's hard even to know how to speak of this extraordinary transformation.

Is the volcanic explosion, as scientists would say, a "disturbance agent" that results in "change" and elicits an "ecological response"? What is gained and what is lost in the thinness of this language? The question is no sooner asked than the scientific language flowers into something like poetry—blast zone / singed zone / standing dead / ashed forest. Ash and tephra / nuée ardente, the glowing avalanche / pyroclastic flows—that precise, that true. And the poets turn their attention to the ways our lives are, in Robert Michael Pyle's words, "bent, changed, refracted, buffed, and scraped—in every way worked by the mountain." The philosophical issues are inescapable: What can the mountain tell us about the meaning of sudden and catastrophic loss? What can we learn from the mountain about what it means to heal?

When Le Guin came up to the mountain, sixteen months after it erupted, she saw "devastation on an enormous scale. One had to think of Hiroshima," she said, "but this was not human-made ... How to understand it?" What is the relation between human-caused and natural cataclysm? Standing in ash on the ridge just beyond the mountain's "ground zero," what might we learn of remorse and moral resolve? What can we learn—by way of contrast or comparison—about the losses in our own lives, the ground shifting under our feet, the uncertainty, the sudden disappearances of people we love, the dreams turned to ash? If we could understand a mountain as change through time, how differently might we understand grief?

And are these lupine-graced meadows a "geography of hope"? No sooner had the ash cooled than small, soft creatures began to emerge

from their hiding places—frogs and chipmunks and salamanders. Seedlings that were sheltered by snow grew up to scatter seeds of their own. Entirely new lakes, ridges, landslides bloomed. Is this survival or recovery or creation—and what do these processes tell us about the sources of renewal in our own lives?

The mountain speaks of resilience—the toughness of life, the fragility of lives. It speaks of permanence and transience, of what endures and what passes away. It speaks of the beauty and insistence of natural processes that, given time, bring the mountain back to life.

The mountain stuns and humbles us with powers beyond human control, often beyond human imagining—a seven-mile-high chimney of shattered rock reaching from deep in the earth into the blue Washington sky. When the earth shrugs, we know in our spines that we are not the center of the universe, and certainly not the directors of its destiny. What do we make of this kick in the pants, this blow to the ego? This creative destruction?

Notes from the Foray

THURSDAY, JULY 21—IN CAMP: We have cautioned everyone in e-mails that our camp will not be beside a babbling stream in a deep, forested glade, but rather on a bulldozed turnout where the gravel road forks, high on the windy, sun-scorched, volcano-blasted ridge between Bean and Clearwater creeks. There are no developed campgrounds this high up, this near the volcano. We have room for the caterer's kitchen trailer, a couple of 10- x 20-foot canopies for shelter from the weather, two port-a-pots, and not much more. We've worried that people will find the place ugly and forbidding, a scar on the Earth. But the pumiceous ground is covered with purple lupine, the weather, after a scorching afternoon, is cooling down nicely, and the view of Mt. Adams to the east is stunning. Everyone has brought their own camping gear and as they arrive they wander off to find places level enough to pitch their tents among the young alders.

Just as the sun begins to set, we gather for introductions on a hummocky human-made hill where hundreds of truck-loads of pumice were hauled and dumped after the eruption. From up here we have a full-on view of Mount St. Helens, the crater and flanks etched by deep shadows in the long evening light. Thin scarves of

orange cloud stitch together the highest ridges. The mountain seems vibrant, imposing, and very close. As we settle into our camp chairs, a plume of ash and vapor erupts from the crater. We are well within the 1980 blast zone. Are we in any danger?

The mountain is covered with sensing devices. The seismic forecast calls for continued dome-building and minor steam eruptions, nothing more. But we are keyed up now, resolved to pay attention, to ask good questions.

FRIDAY JULY 22—AT META LAKE: Blustery winds and rattling rain through the night. This morning, lightning over Loowit. Then more cold, blowing rain.

Crowding into the narrow dining canopy, we eat pancakes with our gloves on, tell each other about our relationship to Mount St. Helens, to volcanoes, to nature. Then we pile into the vans and head out.

Our plan is to hike from Donnybrook to Windy Ridge, a mile-long trail overlooking Spirit Lake that would bring us into close-up view of the crater. But the mountain is hidden in heavy clouds, the wind ferocious. Huddling together at roadside, we listen to Fred Swanson's thumbnail geological history of the mountain—catastrophic eruptions and summit re-building time after time over many millennia. But it's too cold and windy for hiking; we retreat to Meta Lake.

Tucked in amidst young, green fir and hemlock, a lakeside pier and a paved terrace. We sit on the stone wall in a big circle and dig into sack lunches, gradually warming up. When Ursula Le Guin was here in 1981, the summer following the eruption, she found unworldly devastation. Now she can't believe how green it all is. Ecologist Charlie Crisafulli, who has spent twenty-five years doing field studies on Mount St. Helens, tells us that the western toad, though declining throughout its range, is abundant here. And other surprises: many bird species—horned larks, rock wrens, savannah sparrows, western meadowlarks—that did not use the mountain habitat when it was deep forest have migrated into the area. Elk routinely trample his rodent-sampling traps.

The sun comes out, to audible sighs. We hike in to Ghost Lake, where everyone basks on the pumice beach, except songwriter Libby Roderick, who rolls up her jeans and wades into the water, singing. In

the year 2000, the poet Gary Snyder came here with Fred Swanson. In his book *Danger on Peaks*, he wrote about touring the disturbance gradient from the blast zone outward, in a poem which ends—

> Out to Ghost Lake through white snags,
> threading down tree deadfalls, no trail work lately here
>
> ... I worked around this lake in '49
> both green then

Evening campfire on the ridge. Nighthawks dart amongst us, chasing the moths that mingle with sparks from the fire. Stories, poems, jokes. Full moon rising. Coyotes howling. Libby sings a new song she's been working on, "We All Live in the Big Volcano."

BIG steam plume from the mountain.

SATURDAY, JULY 23—EVENING, BACK IN CAMP: Changed. Everyone seems changed.

This morning we decided we would make our hike from Donnybrook to Windy Ridge in silence. Already saturated with new ideas and insights, we were more than ready for some quiet reflection. We started hiking through green firs and arching elderberry shrubs, past shady grottos bursting with wild flowers. But soon we came out onto a barren, sun-dazzled slope where the trail clung unconvincingly to the crumbling mountainside. Spirit Lake rippled below in a mild breeze, much of its surface still clotted with dead trees.

Round the campfire this evening, we were shocked to hear how wildly different were our reactions to the day's experiences. While some of us had been exhilarated by the silent hike on the high exposed trail, others were cast down by the sight of a million dead trees afloat on Spirit Lake, scared almost witless by the narrow trail carved so precipitously into the crumbling slope. Along with our astonishment at the rejuvenation of the landscape, we all seem to feel an abiding desolation.

SUNDAY, JULY 24: Breaking camp. Rolling up tents, bagging garbage, packing the vans. One final group photo on the ridge with the volcano behind us.

After these four extraordinary days camped in full view of the caldera, what does the mountain ask of us now? Maybe just this:

to continue coming together, with science, song, and poetry—with the most careful thought, loving observation, and exact words—to imagine how we ought to live in a volcanic land. What does this mountain tell us about our obligations to all the wounded landscapes around the globe? What understanding might we carry away like vital seeds to sow in our own forever-changing communities?

"Birds have the gift of song," Robin Kimmerer reminds us. "And with the gift comes the responsibility to sing."

"In time, I will be an elder," adds Kim Stafford. "People will turn to me for answers, and I will turn to the mountain."

Charles Goodrich, Kathleen Dean Moore,
Frederick J. Swanson