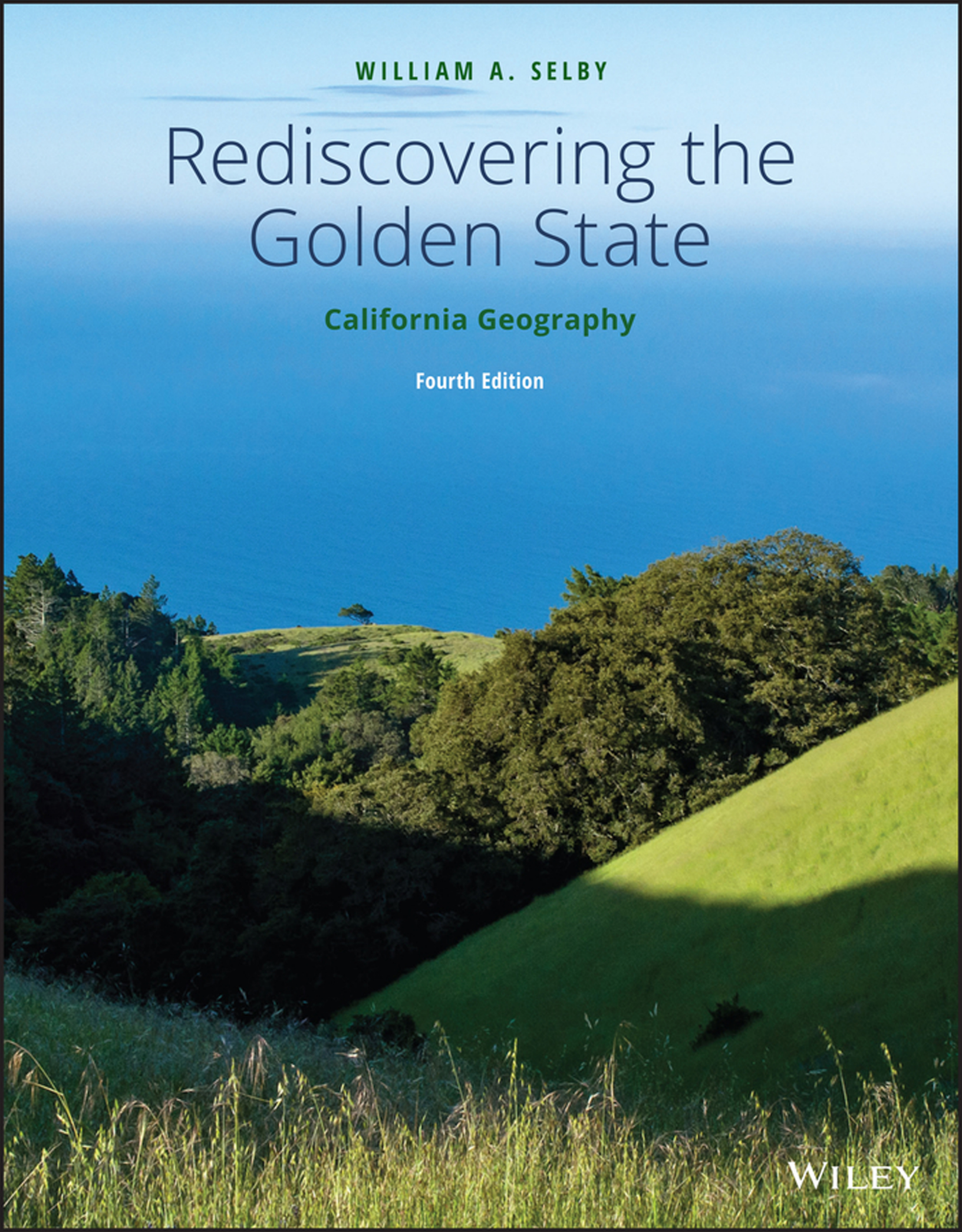
WILLIAM A. SELBY

# Rediscovering the Golden State

## California Geography

Fourth Edition



WILEY

# Rediscovering the Golden State

## CALIFORNIA GEOGRAPHY

Fourth Edition

**William A. Selby**
*Santa Monica College*

WILEY

| | |
|---|---|
| VP AND EDITORIAL DIRECTOR | Laurie Rosatone |
| EDITORIAL DIRECTOR | Jessica Fiorillo |
| EXECUTIVE EDITOR | Glenn Wilson |
| PROJECT MANAGER | Jennifer Yee |
| SENIOR EDITORIAL MANAGER | Leah Michael |
| EDITORIAL MANAGER | Judy Howarth |
| CONTENT MANAGEMENT DIRECTOR | Lisa Wojcik |
| CONTENT MANAGER | Nichole Urban |
| SENIOR CONTENT SPECIALIST | Nicole Repasky |
| PRODUCTION EDITOR | Kavitha Balasundaram |
| COVER PHOTO CREDIT | © Rob O'Keefe |

This book was set in 10/12 pt ITC New Baskerville Std by SPi Global and printed and bound by Lightning Source Inc.



ISBN: 978-1-119-49314-3 (PBK)
ISBN: 978-1-119-49336-5 (EVALC)

***Library of Congress Cataloging in Publication Data:***

Names: Selby, William A., author.
Title: Rediscovering the Golden State : California Geography / William A. Selby, Santa Monica College.
Other titles: California geography
Description: Fourth edition. | Hoboken, NJ : Wiley, [2019] | Includes index. | Identifiers: LCCN 2018031827 (print) | LCCN 2018032066 (ebook) | ISBN 9781119493327 (Adobe PDF) | ISBN 9781119493181 (ePub) | ISBN 9781119493143 (pbk.)
Subjects: LCSH: California—Geography—Textbooks.
Classification: LCC F861.8 (ebook) | LCC F861.8 .S45 2019 (print) | DDC 917.94—dc23
LC record available at https://lccn.loc.gov/2018031827

The inside back cover will contain printing identification and country of origin if omitted from this page. In addition, if the ISBN on the back cover differs from the ISBN on this page, the one on the back cover is correct.

*This book is dedicated to Jim and Julie and to the wealth of remarkably diverse characters helping us to rediscover our Golden State.*

# Finding a Sense of Place and Purpose in the Golden State

## Start Your Journey Here

For twenty years, we have been urging you to look out your window or walk down the street or on to the nearest trail. Use your senses to reconnect to your surroundings. What stories can you discover from a landscape that is screaming out to you? What are the natural and human forces that are shaping this place? How can you use modern technologies to not only measure and interpret what is there, but to imagine what it could be? How can we translate these signals into language we can all understand and into messages that are relevant to our everyday lives?

California may have started as an island paradise in someone's imagination, but it has earned a publication and a project that can help us understand this most powerful state in the United States. Just as geospatial technologies ignited the renaissance in geography that has made it more relevant and applicable and one of the top job-producing disciplines in today's world, this publication and project is designed to provide the information and tools to power a new wave of geographic literacy, understanding and problem-solving that can carry our state forward. And after twenty years of improvements and updates, our project continues to evolve as we monitor California's pulse.

Courtesy of Rob O'Keefe

**Students and Teachers.** In this fourth edition of *Rediscovering the Golden State: California Geography*, we are reaching out to a wide audience of people who want to better understand and appreciate California's diverse natural and human systems and landscapes. An important component of this audience is made up of students and teachers studying the geography of California. Previous editions quickly became the leading "go to" textbooks on California Geography in colleges and universities throughout the state. During the last two decades, tens of thousands of readers have consulted our publication and our project as it has also been used as a key reference for schools and workshops of all grade and age levels. This book is designed so that students will be able to:

- Examine the forces, processes, systems, and cycles that shape California landscapes and impact its people.
- Identify the diversity, connections, and change that define the Golden State, including powerful connections between the state's and the world's many changing physical and human processes and landscapes.
- Apply geospatial techniques to research and identify places and events and to ask and answer today's most important questions.
- Understand the major issues and solve problems that confront California today.
- Rediscover your sense of place.

**Reaching Out to a Wider Audience.** Within and beyond this 2019 edition are stories of how Californians continue to endure and prepare for seismic shocks, climate change, wildfires, water crises, altered ecosystems, and a variety of other hazards and changes in their natural environments. We are also adjusting to economic oscillations and social upheavals that further redistribute and concentrate wealth within specific California regions and communities. The impacts of accelerating revolutions in new technologies, the movement and settlement of its diverse and restless populations, and the search for a more sustainable future are also altering the state's people and landscapes. These and many others that you may be considering now are just a few examples of issues and problems addressed by geographers—and this book—that impact every Californian every day.

Increasingly, Californians are searching for new ways to improve their state and plan for the future. As their discipline has become more relevant and applicable to our world, modern geographers are responding by reaching out to these concerned citizens. Following that spirit, *Rediscovering the Golden State: California Geography* is written for those who want to better understand issues, solve problems, and help direct the path California takes through the twenty-first century. Accordingly, *Rediscovering the Golden State: California Geography* demonstrates how modern geography has evolved into a discipline that cuts across traditional boundaries, linking seemingly disparate real-world issues in a practical and useful fashion.

This fourth edition has further evolved to reflect the dynamic, stimulating, and thought-provoking environments and landscapes of the Golden State. It comes during a time of great adversity and promise that challenges every Californian every day to redefine and reimagine what has been called the California Dream. It is a time when Californians are divided in many ways socially, economically, politically, and geographically. Endowed with all of our natural and human resources and diversity, geography helps us understand our connections and common goals so that we make the decisions and steer the changes that will continue to move our state forward as we also lead the world. As in previous editions, we challenge the reader to look beyond simplified stereotypes and assumptions to the sometimes complex realities that make California unique. You can see that this fourth edition is much more than an update; it is a refreshing reinforcement of the original unifying themes of previous editions, showing how unequaled *diversity*, powerful *connections*, and accelerated *change* continue to shape California's landscapes through the twenty-first century.

In this book, you will see why there are still no rivals to the **diversity** of California's physical forces and human processes and the landscapes they are creating. We continue to unveil powerful **relationships** and to reveal profound **connections** between seemingly

disparate events and landscapes. We explore how Californians continue their attempts to confront and control remarkable **changes** that are dramatically shaping this state as we progress through the twenty-first century. We can see again that just as six years radically changed California between the second and third editions, so have there been astounding changes during the last six years to this edition.

## Keeping it Relevant, Applicable and Up-to-date

In this edition, we once again take advantage of some of the most current geospatial technologies that will help illustrate concepts, clarify discussions, and lead to problem solving. We incorporate cutting-edge satellite images and maps (including images from geographer William Bowen) that add color and challenge the reader to look further. We include examples of some of the most current imagery on line that takes the viewer on breathtaking tours over the state, flying and observing from different directions. You will never again see California with the same perspective. We also use updated population and related human geography maps made by accomplished geographers James P. Allen and Eugene Turner (CSU Northridge) as presented at the California Geographical Society. We include select maps from geographers Mary Beth Cunha and Stephen F. Cunha of Humboldt State University's Institute for Cartographic Design that also appear in their California Geographic Alliance Atlas.

This edition is part of a larger and growing project. You will have access to our "Visualizing California: Finding a Sense of Place and Purpose in the Golden State" website at *www.rediscoveringthegoldenstate.com.* There, you will find thousands of images and essays that tell captivating stories, including additional links to new data and other informative sites. Rob O'Keefe (geographer and website developer) built and maintains this outstanding resource and continues to add compelling stories and spectacular images. Geography professor Jing Liu has added some colorful and informative story maps. This living website takes the viewer on a regional and then systematic exploration of the state, chapter by chapter. You will find maps, thousands of photos, and other information that will take you far beyond the scope of one book or geography course; teachers should find more supporting information than you will ever need or have time to display in any single course.

You can see how we are dedicated to making this an even more relevant, colorful, and user-friendly edition, a project that is designed for a wider audience. The additional photos and figures better illustrate important concepts and highlight important places. Refreshing updates emphasize recent changes and illustrate visions of the future California. It is designed for those who want to learn more about the processes that have molded the state's natural landscapes. It is also intended for those who want to learn more about our human landscapes and how geography has shaped the state's human history. It serves people working in businesses, organizations, education, and government agencies, who must better understand and anticipate current and future trends. It is written for concerned citizens and policy makers who are responsible for making informed decisions that will move California in a positive direction. And it will serve well those who are simply curious, including those living in and out of California who just want to learn more about the Golden State and its continuing experiments.

To all of you, let this be your invitation. Here's your opportunity to learn why geographers and geographic techniques play increasingly important roles in analyzing issues, trends, and problems, and in shaping the future of California. Rediscover your sense of place and the power of place; break through your barriers, and reconnect to your surroundings. If you are curious, we have opened the door for you by creating your best single source about California. From this publication, you can pick and choose the information that suits your needs, information that will help you better understand the most powerful and dynamic state in the United States.

## Measuring California's Pulse with the Latest Technologies

Like other great developments that have transformed human history, the ongoing technological revolution is helping to redefine the kind of society we choose to be. As virtual relationships are becoming more dominant, many people know more about people through virtual contacts than they do about their closest neighbors. Facebook growing into the largest community ever assembled by 2017 is just one example of how exploitation of these technologies has changed our concepts of communication, power, community, states, and even nations. It is impossible to ignore these sweeping changes brought by this fundamental revolution that is outlined in countless books and other works that include David Rothkopf's *The Great Questions of Tomorrow* published in 2017. As the world evolves through this threshold of change, California is the epicenter and it is truly in so many ways the end of the world (and of California) as we knew it. Just as our state (where new technologies are tested and nurtured) shines as the center of this movement, California takes on great responsibilities to demonstrate how these technologies can be used to encourage positive progress toward improvements in peoples' lives and communities as we avoid suffering the negative consequences that result from misusing and abusing technology.

Your purchase of an eBook opens the door to an interactive learning experience, specifically designed to guide your learning adventure through the Golden State. In addition to our popular www.rediscoveringthegoldenstate.com website, here you will find chapter questions and other educational tools designed to enhance your learning experience.

And so we use these cutting-edge technologies to enhance the quality and substance of this publication and to increase the credibility and versatility of this project. Here, technologies are being used to inform a greater audience and to share useful knowledge with anyone who has the will to consider, absorb, and interact with it. Students and educators are encouraged to enhance their learning experiences by using our additional educational tools that include a wealth of review and thought questions and activities designed to guide you through each chapter. This content can also be found on the Instructor's website at www.wiley.com/go/selby/rediscoveringthegoldenstate4e. All users will benefit from updates on our website: http://www.rediscoveringthegoldenstate.com/

## Some Unifying Themes

Three very general themes shape our examination of California geography in this text. The *diversity* of California's physical and cultural landscapes is exceptional. The array of geologic processes and landforms, climates, plant and animal communities, and waterscapes in California continues to challenge our best natural scientists. And, though California's diverse human geography is more than a reflection of the state's natural history, its myriad human landscapes and cultures are sometimes products of the natural settings on which they are founded.

A solid understanding of California's geography must include the *connections and relationships* in time and space among so many aspects of the state's natural and human environments. The first step is to appreciate how humans have depended on California's natural settings and resources, and then to see how and why humans have impacted, modified, and exploited these natural landscapes. We can then begin to focus on more

specific connections and issues within this larger framework. One example is how the distributions of natural resources and primary industries have influenced the nature and location of California's modern economies and urban landscapes. The scales or scopes of interconnected problems and issues are often more specific, but they must always be considered under that larger, more general umbrella of connections and relationships, including those to the rest of the world.

Finally, the rate of *change* in California's natural and human landscapes is remarkable when compared to any other state and to most other locations on our planet. These changes range from active geologic processes to unpredictable and anomalous patterns in weather and climate, from the expansion or destruction of certain species and entire communities of plants and animals to the enormous water diversion and flood control projects that have radically changed California's waterscapes. Change helped define California's natural environments even before the great human settlements and developments.

The changes wrought by California's people are even more dynamic. Great migrations, which contributed to exploding populations, have occurred not only into the state but also within the state. Migrations brought a diversity of cultures into California, and the geographic and economic movement of these cultures has a significant impact on the state. There are few places in the world where people have such mobile and versatile lifestyles and careers. And there are few other places where people and their cultures, economies, and landscapes experience such recurrent and dramatic upheavals. The ability to change continues to be an essential survival strategy in the state.

## Acknowledgments

Thousands of students throughout the years at Santa Monica College and at colleges and universities throughout the state have inspired me with their thoughtful suggestions and input for this fourth edition and previous editions. A few students contributed with specific research, such as Christine Menges and Stefan Laage. Thanks to geographers Vicki Drake, Pete Morris, and Jing Liu for their insightful suggestions over the years. There are also dozens of colleagues and professionals from across the state to add to the original list of professors and professional geographers who made valuable suggestions for this edition. During all of my California experiences growing up, going to school, working in private industry, and decades of teaching, I have been lucky to have family, friends, colleagues, and students who color my life and my work with positive learning experiences. Without all of you, this publication would not be possible. Thank you for encouraging my love for geography and for California.

Thanks especially to Dr. William Bowen and the California Geographic Alliance for producing the impressive images and flyovers and to James P. Allen and Eugene Turner from CSU Northridge for their exceptional maps showing population and related trends. Mary Beth Cunha and Stephen F. Cunha contributed excellent maps made at the Institute for Cartographic Design at Humboldt State University's Geography Department from their California Geographic Alliance atlas. Geographer and artist Patty Kellner contributed some of her inspirational paintings that added color to the previous edition. You will notice several maps and phenomenal photos by geographer and photographer Rob O'Keefe, but his work building and contributing to our website helps to make this a one-of-a-kind project that will live on at *www.rediscoveringthegoldenstate.com*. These remarkable geographers and cutting-edge products combine to make this an exceptional and memorable publication.

The Association of American Geographers (AAG), Association of Pacific Coast Geographers (APCG), and the California Geographical Society (CGS) publications and conferences exposed a wealth of recent research that reinforced this edition. Past and present fearless leaders of the CGS deserve much credit for building an organization that should make all California geographers proud. Numerous other professional organizations and scholarly publications have contributed to the quality and credibility of this work.

Finally, special recognition goes to the professionals at John Wiley & Sons, Inc. for their dedication and patience throughout this process. Jennifer Yee (Editor - Science), Judy

Howarth (Manager – Content Enablement), Kavitha Balasundaram (Production Editor), and Ayantika Chatterjee (Editorial Assistant) added their time, skills, and expertise that improved the quality, credibility, and success of this publication.

## About the Author

William Selby is a native Californian who has explored every corner of the Golden State. He earned his undergraduate degree in southern California (California State University, Fullerton) and his graduate degree in northern California (San Francisco State University). He has lived and worked in many diverse California landscapes and neighborhoods, from rural to urban, in both southern and northern areas of the state.

Professor Selby had extensive experience in private industry before beginning his teaching career in 1981. He then taught geography and science to a variety of grade levels and age groups before taking his position at Santa Monica College in 1985, where he served in many leadership roles. He has also been a guest lecturer at UCLA, taught courses at UCI as a Visiting Professor, and he continues to lead many teacher training workshops. His membership and participation in several professional organizations includes numerous presentations at the Association of American Geographers, Association of Pacific Coast Geographers, and the California Geographical Society. In addition to teaching a wide range of earth science and geography courses, Professor Selby has organized and led hundreds of field trips throughout the state and beyond with his colleagues and students. He is recognized as an accomplished speaker on a wide range of subjects in geography and earth science.

His diverse research interests and professional and personal activities reflect Professor Selby's devotion to geography, his love for the Golden State, and his concern for its future. This book combines his academic expertise and his practical experiences within California's myriad landscapes, along with exceptional contributions from many other scholars and professionals, to present an invaluable guide to California in the twenty-first century.

# CONTENTS

CHAPTER 1

# Getting to Know the Golden State

### Still Changing After all These Years

You don't have to look far to notice: as expected, the 6 years since our previous edition brought more frequent and dramatic changes to California. People and landscapes of California's great urban centers may have experienced more rapid change compared to the relatively gradual changes that are shaping landscapes in the state's more spacious bucolic and rural landscapes. This has helped separate and further divide the state's land uses, economies, cultures, and political geography into two Californias. Still, change has been evident even in those sparsely populated landscapes where it is more apparent that people directly depend on nature's cycles and ecosystem services that sustain their primary industries. Chapter 1 surveys each of our Golden State's diverse remote, rural, and urban regions, the powerful trends and forces that continue shaping them, and the connections that stitch them together within the place we call California.

## From Dreams to Reality: An Experiment Called California

**California** has always been a land of legendary extremes. Stories of its incredible natural beauty, its extravagant wealth adjoining abject poverty, its diversity of natural resources and landscapes, and its violent and destructive natural disasters make world news headlines each year. These stories have been repeated since the first Spanish explorers, and then settlers arrived here centuries ago. And, California's people, both real and imagined, have always successfully competed with nature for the spotlight. Even its name originated from a mythical location.

Exploiting imaginations after the European "discovery" of America, the Spanish writer Garcí Ordóñez de Montalvo first named a place called California in his *Las Sergas de Esplandián* (*The Exploits of Esplandián*). Even in this first use of California in 1510, he fabricated an island paradise near the Indies where beautiful black Amazons were surrounded with riches such as gold and pearls.

The name California first appeared on Spanish maps labeling the Gulf of California and the Baja Peninsula in the 1560s. After the Spanish "discovered" California in 1542 and finally began moving and settling north in 1769, what is today known as California was often given the name Nueva (New) or Alta (Upper) California.

As those first Spanish explorers and settlers sent their actual impressions back to their homeland, they described a landscape hauntingly similar to today's. They painted pictures of wildly different landscapes that ranged between a comfortable paradise and a harsh land where agonizingly hard work and plenty


Mary Beth Cunha and Stephen Cunha, Humboldt State University Dept. of Geography (circa 1650, Johannes Vingboons)

of luck were required for survival. Similar expressions were recorded throughout the Spanish and Mexican Eras; such reports continued even after California became the thirty-first state in the United States in 1850. More recent writings continue to conflict as they portray a land of remarkable contrasts and contradictions.

Today, California's unsettled population is always evolving, always moving on, creating repeated social upheavals that leave its past in the dust like a forgotten stranger. It is as if California's people are trying to emulate the turbulent forces that shape its natural landscapes as the world looks on. The result is the most diverse population and economy on our planet. California is and will continue to be a celebrated culture hearth in the twenty-first century. Critics beyond its borders have tried to minimize the importance of

## For the Student: Key Discoveries in Our Chapter 1 Journey

- This book is a systematic, topical survey of the modern geography of California. It is designed to provide useful information that can help us understand the state, examine modern issues, and solve problems.
- California's diverse natural and human landscapes represent ideal laboratories; they provide a wealth of opportunities to make scientific/geographic discoveries and to research a variety of processes, cycles, and systems that are shaping landscapes on many scales.
- The five fundamental geographic themes and six essential elements of geography are common threads that tie together topics covered in this and other chapters of this book.
- Diversity, connections, and change are evident in all California landscapes and in the processes responsible for shaping them; consequently, they are common themes used in this chapter and this book.
- Critical to our understanding of California is recognition of some important geographic factors. They include its large area and elongated shape, its situation in relation to the rest of the world, and the human/environment interaction that has shaped its landscapes.
- Early California remained relatively isolated even after the Spanish, Russians, and other invaders discovered and began settling it. Strong ties to Latin America developed, continued during the Mexican Era, and have been recently renewed. Since the mid-1800s and the Gold Rush, growing populations and advanced technologies have strengthened connections with other cultures and nations, particularly on the Pacific Rim.
- The state can be divided into diverse physiographic regions, which are connected in profound ways and are experiencing different types and rates of change.
- The survey of the regional geography of California in this chapter introduces the state's general landscapes and some of the processes that change them. In the survey, we sweep clockwise around the state from region to region. This information will serve as a foundation on which the more dynamic and scientific, systematic, and topical study of the state is constructed in later chapters.
- Though each physiographic region demonstrates unique and recognizable qualities, each also shares processes and landscapes with its neighbors. These differences and divisions and relationships and connections combine to shape modern California.

this nucleus for our civilization, and although some Californians fear the responsibilities that accompany such esteem, California earns its attention. As the reality of the state's stature—with all its positive and negative features—becomes more apparent, every Californian continues to play a role in molding this great experiment, this model we call California.

Recent college classes (especially in literature) in California and across the country illustrate this fascination with the state and include such titles as "Visions of California," "California Dreaming," and "Global California: Crisis and Creativity." Associate Professor Beverly Hogue at Marietta College in Ohio (who specializes in twentieth-century literature) brought her students to California in 2011. She made it clear in an L.A. Times interview published in 2012: "The popular culture's image of California is a place where anything can happen. We still see it as a place of possibility." Perhaps it has been best expressed in a portion of the University of California Berkeley's description for their course on California posted on their website: "California may be 'a state of mind'—as bumper stickers say—but it is also the most powerful place in the most powerful country in the world. Its wealth and diversity in both human and natural resources has contributed to its extraordinary resilience, making it a center of technological and cultural innovation." Their 2017 course description still included, "California has been called 'the great exception' and 'America, only more so'." These accolades have grown even more relevant and credible as we research and write into 2018.

## Geographers Study California

Some observers use a microscopic viewpoint to pick apart the very details that eventually come together to build California's landscapes. Some of their precise observations and studies may pinpoint particular locations or focus on specific issues or problems, but investigators of detail must never forget the big picture. How are surrounding locations connected, and how are seemingly disparate events related? At the other end of the spectrum are those who would use a telescope to view California. They see the major trends and paint the state and its people with sweeping generalizations. Though this may be an easy method, it can provide an unrealistic picture that denies the specific exceptions and the uniqueness within California's landscapes and its people.

You might study a single grain of sand on the beach or the mountains, or the entire rivers and coastal systems where it was eroded, transported, and deposited. You might observe a street sign or homeless person on one city block or study the entire infrastructure of the metropolis where they are found. Alternating your scales of view helps strip away the film for a clearer vista.

Therefore, it is necessary to zigzag between these two approaches, going from the smallest to the largest scales and back again. A balance must be found between them in any meaningful study of California. This is a great challenge in a state that is so big and that has so many diverse landscapes with so many powerful stories to tell. It is also a challenge because most of California's landscapes and its people fit somewhere between the extreme stereotypes that constantly bombard us from popular sources of information. The reality is that most Californians share the same basic values and dreams of many Americans and of people in other countries.

The big difference is that California landscapes and their people always seem a little closer to the edge. Although Californians' dreams are lofty and spectacular and though they may have become more difficult to realize, they *are* still attainable. Likewise, Californians' fears of impending failure and disaster may also be deeper than other Americans. Like California's landscapes, its people seem a little more willing to participate in the next experiment. They are always evolving, but they are also waiting for that next surprise, that next unexpected drama, which must lie ahead in such a dynamic state.

Consequently, this state continues to be ripe for research, planning, and innovation by modern geographers, whether


William Selby

**FIGURE 1-1** Cameras mounted on this Google car show how they have accumulated thousands of 360-degree photos of many of your favorite locations in California. This survey car was crossing Lombard Street toward the Marina in San Francisco taking photos that you might have seen on Google's web site, another example of how technology has revolutionized how we study geography. Their photos now cover every continent.

they are formally trained professionals or amateurs and volunteers just testing the waters. Like California, geography continues to evolve and experience a renaissance. Modern geography has become a more practical, more useful discipline. It is being used by all of us to assess the **sites** or the environments of places where we live, work, and visit. And it is being used to understand the **situations** (or surrounding environments) of those specific locations and the relationships and connections between them.

### Twenty-First-Century Geography in California

Just as California continued to experience extraordinary change into the twenty-first century, geographers around the nation and the world organized to define and direct profound changes caused by the renaissance in their own discipline. In 1994, they identified and agreed on 18 National Geography Standards and organized them under six essential elements of geography. By 2012, geographers had refreshed, updated, and published a second edition, "Geography for Life," with more emphasis on geospatial technologies, globalization, and global environmental change. These published standards were built on the five original and fundamental geographic themes, which focus on location, place, human/environment interaction, movement, and regions. These themes and standards are also among the common threads that stitch together this work on the geography of California.

How are essential geographic elements and standards addressed in this book? We will see California in spatial terms as we organize and analyze natural and human processes, systems, and landscapes. This requires the use of maps (both physical and mental) and other geographic tools and modern geospatial techniques. We will learn about the many places and regions that make up California. We will examine California's physical (natural) landscapes and the processes that change them. We will also learn about the people and cultures of California, their human landscapes, and the processes that are changing them. Additionally, we will look at the connections and relationships between California's natural environments and its people. Specifically, how has the physical environment affected human populations and landscapes? Then, how and why have humans modified California's physical landscapes and used its natural resources? Finally, after interpreting California's past, we will use geography to understand present landscapes and to plan ahead into the twenty-first century California.

Further response to the renaissance in geography came from the National Research Council with their 2010 report, "Understanding the Changing Planet: Strategic Directions for the Geographical Sciences." Their 11 strategic questions/directions are designed "to focus research and leverage new technologies to harness the potential that the geographical sciences offer." Again, we address these topics throughout this book that include our physical environment, biological diversity, climate change, human population, migration and health, effects of globalization, and how we do research and use maps to visualize and study the state.

Another way of looking at modern geography is to break it down into its basic subdisciplines. Physical geography focuses on natural landscapes and the processes responsible for them. Geomorphologists, climatologists, biogeographers, and hydrologists are among the many physical geographers. Human geographers study human landscapes and the people who shape them. They may have more specific interests, such as population, migration, cultures, economies, and rural or urban landscapes. Finally, modern geographic (geospatial) techniques are being used by all geographers. Computer cartography, Global Positioning Systems (GPS), air photo interpretation and other remote sensing methods, and widespread applications of geographic information systems (GIS) are tools of the twenty-first century geographer as they consistently rank near the top of job-creating industries. Regional geographers who study specific geographic regions must incorporate each of these subdisciplines and methods into their research.

Regardless of the specific method of study, it is obvious that California's natural history and landscapes and its human history, its people and their landscapes are more than dynamic and diverse; they are connected and related in profound ways. They offer hidden secrets yet to be discovered, and they offer astounding surprises yet to be experienced. This is why modern geographers—and all Californians—must play key roles in the understanding of California's natural and human landscapes and the people who inhabit them. They must also help drive California in a direction that will improve the living environments of all its people. If geography and geographers are left out of the critical decision making that will shape the future of our state, it will be unfortunate for geographers and a lost opportunity for all Californians.

Our knowledge of geography will enable us to better understand our state and direct it toward a more promising future.

## Here's California

### Finding the Golden State and Its Boundaries

Consult a good map for this section. California's northern border with Oregon is at 42 degrees N. The southern border with Mexico does not follow a line of latitude. It starts


William Selby

**FIGURE 1-2** In Petaluma, you may notice these street signs at key locations showing your exact latitude and longitude. Here, geographers and others don't need a GPS to know they are at 38.2 degrees north of the Equator and 122.6 degrees west of Greenwich (showing location in decimals of degrees rather than in minutes).

on California's southwest corner just north of 32 degrees, 30′ N on the coast, and follows a line running slightly north of east, until it ends at the Arizona border (the most southeast corner of California).

The eastern border with Nevada follows the 120 degree line of longitude south—from the state's northeast corner on the Oregon border—to Lake Tahoe. From here, another straight line then trends southeast, still marking the California/Nevada border, and slices across lines of latitude and longitude until it ends at a point shared with the Nevada and Arizona borders in the Colorado River. From here, the border with Arizona follows the Colorado River south until it reaches Mexico at the far southeast corner of California. This eastern border and the Colorado River meander east almost making it to the 114 degrees W line of longitude, just east of the Whipple Mountains.

California's coast veers from just past 117 degrees W at the Mexican border, toward the northwest, far west of the 124 degree longitude at Cape Mendocino (the westernmost extension of California's coastline). The coastline's enormous range of longitude might surprise those who consider this a north–south trending state. San Diego's longitude is the same as parts of Death Valley and central Nevada, up to 650 km (400 miles) of longitude east of Cape Mendocino!

Consequently, this northwest–southeast trending, elongated state covers about 9½ degrees of latitude and more than 10 degrees of longitude on our earth. (Since lines of longitude merge closer toward the poles, you can see that a length of a degree of longitude is shorter than a degree of latitude through California. Then, you can see that the east–west distance, even when measuring through the full range of longitude, is shorter than the north–south distance through the state.)

## Size and Shape Help Define California

So much of California is about being big. With approximately 411,013 sq km (158,693 square miles) or 101,563,520 acres, it is the third largest state, ranking behind Alaska and Texas. It is larger than Japan, Great Britain, Italy, or Norway. As previously noted, it is much longer than it is wide. A straight line from northwest to southeast along its coast runs about 1,220 km (nearly 760 miles), but there are at least

### California's Geographic Center

Where is the geographic center of this strangely-shaped state? This geographic trivia has been debated for decades in California. Though it may have no practical significance, various communities have tried to claim it and even measure it. You can get an approximation by using a solid cutout map of the state and trying to balance it on a pen or pencil. You will notice that it balances around Madera County more than 20 miles northeast of Fresno. But that leaves plenty of spatial error to exploit. For instance, in the past years, residents of the Sierra Nevada foothills community of O'Neils cited historical markers that placed the center somewhere near their Spring Valley School. Using the latest technologies, more recent measuring surveys by geography students and others have finally zeroed in on what seems to be the accepted location a little farther up North Fork Road near North Fork.

According to surveys completed by volunteers from Fresno State University (including an official state surveyor) and the National Forest Service and the USGS, this is the confirmed geographic center of California as of 2017: latitude 37°09′58″N, longitude 119°26′58″W or (depending on how your GPS reads) 37.16611°N, 119.44944°W. The residents of North Fork have maintained a sign next to their road declaring their town as the center. Local organizations that include the North Fork History Group dedicated a plaque at the verified site a few miles southeast of North Fork along Road 225. By 2017, it had been replaced by a new plaque at the end of some stairs where you may also find a "CAL CENTER" marker. It is fittingly surrounded by an iconic California Sierra Nevada foothills woodland that includes oak and buckeye, but don't expect to find much human activity there.

Therefore, if you find yourself around 37 degrees N and 119 degrees, 30 degrees W, you are near California's geographic center. Our review of California's odd shape and borders may seem to diminish the importance of such detail (see Figure 1-3).


**FIGURE 1-3** Its location and situation and its size and shape help define the state of California. The boundaries and names of counties reflect a rich history.

2,027 km (1,260 miles) of entire jagged coastline. (California's entire tidal shorelines—including inlets into bays and rivers and the outer coast and offshore islands—total far more than 5,000 km (more than 3,000 miles long). In contrast, California is barely more than 240 km (150 miles) wide from San Francisco to Lake Tahoe. At its widest, it is barely more than 400 km (250 miles) from Point Arguello to the Nevada border.

## Diverse Natural Landscapes

This large area and long shape have contributed to the state's number-one ranking in so many categories within

its natural and human landscapes. Its Death Valley has the lowest point in North America at 86 m (282 feet) below sea level. There are other desert valleys all the way to the Mexican border that drop below sea level. California has the highest mountain peak in the United States outside Alaska—Mount Whitney, at 4,421 m (~14,505 feet). There are numerous other peaks higher than 14,000 feet, and they are all in the **Sierra Nevada** except White Mountain Peak (~14,250 feet) and majestic Mount Shasta (>14,170 feet). The variety of high mountains and deep valleys are a result of the many different geologic processes and landscapes contained in such a large state situated along active tectonic plate boundaries. California also has some of the most varied and abundant earth resources on our planet. These geologic processes and landscapes are reviewed in Chapters 2 and 3.

Across such diverse topography and nearly 9½ degrees of latitude, there must also be a wide variation of climates. From near Death Valley to the northwest coast, mean annual precipitation ranges from less than 5 cm (2 inches) to more than 250 cm (100 inches). Each year, temperatures in the state will range above 49°C (120°F) in the southern deserts to well below −18°C (0°F) on numerous occasions in the northern highlands. (The hottest temperature ever recorded in North America was 57°C (134°F) in Death Valley.) These changing climates are explored in Chapter 4.

A splendid assortment of plants and animals have adapted to these variations in climate and other physical conditions. The tallest living things in the world—coast redwoods (*Sequoia sempervirens*)—grow on California's northwest coast. The largest living trees in the world—Sequoia redwoods (*Sequoiadendron giganteum*)—grow in the western Sierra Nevada. The oldest individual living trees in the world—bristlecone pines (*Pinus longaeva*)—grow in eastern California's White Mountains. The oldest living plants in the world—creosote bushes (*Larrea tridentata*)—grow as rings of clones in the southeast deserts. As this list of records grows, these "firsts" serve only as examples of

## Is Bigger Really Better?

There are disadvantages to having such a large, elongate territory contained in one state. Divisions between the resource-rich, rural north and the economic and political urban powerhouses of the south have always fueled talk of breaking up this one large state into two or three smaller ones. Since 1941, some northern California residents have argued for their own State of Jefferson that would merge counties at the very northern end of the state with the southern end of Oregon, locating the capitol inland at Yreka. The California legislature nearly split the state into north and south in 1965 and 1967. The idea became popular again during the 1990s, when every rural northern county voted to break away into its own state of "Northern California." These water-rich Californians saw their rural values and lifestyles (supported by primary industries such as timber, mining, agriculture, and ecotourism) as no match for the perceived water-grabbing, cutting-edge urban giants to the south. But, statistics show that instead of benefiting from the creation of a new state of Northern California, these rural counties would have isolated themselves into one of the poorest states in the United States.

Still, whether perceived or real, the divisions exist. Northern Californians often share typical stereotypes and sweeping generalizations about the south, including images of high crime rates, air and water pollution, traffic jams, higher taxes, fast-paced, unrestrained lifestyles, and unmanageable cities. In response, some southern urbanites may try to paint northerners as backward isolationists lacking culture and living where there are fewer conveniences, little social life or excitement, and little opportunity to change and grow.

Meanwhile, the populations of the San Francisco Bay Area and parts of the Central Coast and Central Valley are often caught in the middle of this philosophical tug-of-war. They may despise Southern California attitudes and lifestyles, but they also see themselves as more cosmopolitan and more on the cultural and economic cutting edge than their rural neighbors to the north. Some claim this calls for a third state—a Central or Middle California.

Such divisions are enhanced by geographic distance. How does a resident of San Diego relate to events in San Francisco or the state capital of Sacramento, with a travel distance more than 800 km (500 miles) to the north, much less to someone in Crescent City or Alturas, more than 1,300 km (800 miles) north? And how can an effective and efficient state government operate across such disparate landscapes? It becomes apparent that California's very strengths—its size, the diversity of natural and human landscapes, and the various forces shaping them—can be construed as liabilities by those who would divide the state. More profound differences have recently emerged between inland and far northern California's relatively traditional and conservative communities versus the more progressive powerhouse coastal cities from the Bay Area to the Mexican Border.

Proponents of division may not realize how California's seemingly separate regions and people depend on one another and are connected in profound ways. Just watch as the north's abundant natural resources flow south and the political and economic clout of the southern cities help balance and stabilize an otherwise isolated north. On the occasions when this enormous state recognizes its diverse economies and cultures as assets, the usual result is long-term stability, balance, and prosperity. When we ignore these unique assets, we struggle.

the fascinating variety of plants and animals surveyed in Chapter 5.

All of these natural factors have combined with humans to produce diverse waterscapes scattered throughout California. Humans have now exploited these water resources by building some of the largest water projects in the world. This hydrology and efforts to build a sustainable water supply future are the subjects of Chapter 6.

### Diverse Human Landscapes

The assorted human invaders and settlers were just as diverse as the landscapes into which they moved (topics of Chapter 7). Their human landscapes have evolved to reflect California's impressive size. By 2018, California's population (according to the U.S. Census Bureau and the California Department of Finance) grew to about 40 million. It not only has the largest population of any state, it is also the most diverse. California contains the greatest populations in the world of several ethnic groups living outside their countries of origin, and it has the greatest number of people speaking the greatest variety of languages compared to any other state. These are topics of Chapters 7 and 8.

California also has, by far, the largest and most powerful economy in the United States, and it now ranks fifth in the world, blazing ahead of Great Britain and still ahead of France, India, Italy, Canada, and Russia. Southern California alone would be near 15th in a worldwide list. California is the standout leader in agriculture, where it leads in the production of several crops. It is also near the top of timber, mining, and fishing industry states. These are the topics of Chapter 9.

The state's powerful primary industries are only surpassed by its modern, advanced industrial powerhouses. The trade, high-tech, finance, entertainment, and service industries in California have not only exploded past traditional industries, they are overshadowing developments in other states and nations. Perhaps this helps explain why Los Angeles/Long Beach is the number-one port in the country. These are the topics of Chapter 10. Chapter 11 highlights some of the greatest urban landscapes in the world, including the Bay Area, southern California's coastal plains, and the relatively smaller inland cities. In Chapter 12, we apply geographic concepts and methods to understand current issues, solve problems, and look to the future.

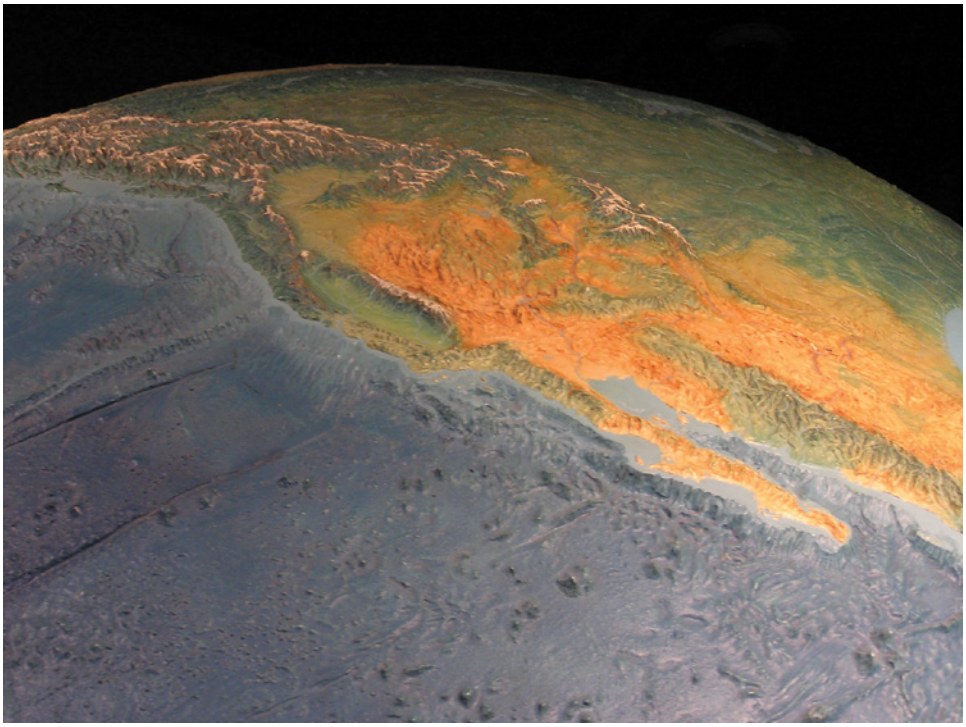
Yes, Californians have built an assortment of fascinating and unrivaled rural and urban landscapes.

## California's Situation

California's **situation** (its regional position in relation to other locations) has also had a profound impact on its evolution, history, and settlement patterns.

### Situation and Physical Geography

The state is situated along tectonic plate boundaries, where dynamic geologic processes continue to shape a variety of landforms such as its giant mountain ranges bordered by deep valleys. You will find more details on geologic processes in Chapters 2 and 3. California's middle latitude climates are influenced by the Hawaiian (East Pacific) Subtropical High Pressure System, which causes summer drought.



William Selby

**FIGURE 1-4** Here is a clear view of California's situation shown in this model at Griffith Park Observatory.

Then, the Aleutian Low slips south during winter, ushering in storms to provide much-needed precipitation to the state. California is not far enough south to experience tropical climates; its location on the west coast and east side of the Hawaiian High ensures a cool ocean current (known as the California current) that moderates any tropical air masses moving toward the state. You will find specific definitions and details on weather and climate in Chapter 4.

California's plants and animals have adapted to the middle latitude Mediterranean climates that dominate west of the major mountain ridges. Meanwhile, desert life forms must endure prolonged drought and temperature extremes common on the leeward sides of the very mountain ranges that were shaped by the geologic processes previously mentioned. For more on the state's biogeography and hydrology, refer to Chapters 5 and 6.

## Situation and Human History

### Isolation

Most modern anthropologists agree that California's first people were descendants of those who crossed over the "land bridge" into North America from Asia. Previously, the greatest ocean in the world had separated these otherwise mobile people from California. Today's anthropologists continue to examine evidence (such as mastodon fossils and possible tools) that may confirm or challenge established theories. Today's anthropologists continue to examine evidence (such as mastodon fossils and possible tools) that may confirm or challenge established theories. (Some California Indians have very different traditional stories and explanations of their origins.) Their populations eventually swelled to more than 300,000 before the Spanish arrived. Many Native Americans in California were often *isolated* by deserts and major topographic barriers, not only from other North American Indians but also from groups prospering in other California regions. Later, these same barriers would help keep California *isolated* from the westward expansions of Anglo-Americans through the early 1800s. The Rocky Mountains, great southwestern deserts, and the Sierra Nevada combined to represent formidable barriers to overland parties that may have otherwise considered California.

Consequently, the first European explorers and settlers of California almost always arrived by boat. The Spanish sea expedition from the south headed by Juan Rodríguez Cabrillo was apparently the first to "discover" California for the Europeans in 1542. A number of Spanish and other European powers explored the California coast after him, including Sir Francis Drake, who claimed parts of California for England as early as 1579. The still isolated and distant regions of California would wait until 1769 before Europeans made any serious attempt at settlement. This is when Father Junípero Serra and Captain Gaspar de Portolá established the first settlement at San Diego. They continued north as Spain took formal possession of "Alta California."

William Selby

**FIGURE 1-5** This mural at the Americana Mall in Glendale attempts to cram as many California iconic landscapes as possible into one view. The scale is purposely distorted to display the beauty and diversity of the state.

Even after 1769, California's continued isolation contributed to slow growth and expansion of the early Spanish settlements. This left the door open to other invaders from the sea. These were the Russians from the north, who hunted sea otters down the northwest coast of California into the mid-1800s until the otters were nearly extinct. They met little resistance in this wild land and established and settled Fort Ross between 1812 and 1841. California's Russian River and other geographic features took names from these people and their distant homeland.

### The Latin American Connection

By the early 1800s, the Spanish had already gained control of much of California. After those first Spanish settlements in 1769, they spread their presidio–mission–pueblo plan to settle across California's coastal valleys. They finally established solid land routes from New Spain (Mexico) north to "Alta California." This introduced another major locational factor in California's history and development: its strong ties to the people and cultures of the south—first Spanish, then Mexican (after 1822)—have had enormous influence on California's human landscapes. This involves much more than the Spanish names of California's streets, towns,