CHAPTER 3

INSTRUCTION IN ECOLOGY: SCIENTIFIC NATURAL HISTORY

Prior to relocating the facility to China Point, one of the courses offered during the final summer session at the Hopkins Seaside Laboratory (1917) was a class titled “Marine Invertebrates.” With Walter K. Fisher as instructor, the description for this course read: “A study of the groups of invertebrate animals found in the sea with especial reference to relationships and ecology.”¹ This course description marked the first time the term "ecology" was mentioned in the lexicon for describing instruction offered at Stanford's seaside laboratory.

Following the relocation of the facility to China Point, during the summer quarter of 1919, the title of WK Fisher class changed to read “The Classification and Ecology of Marine Invertebrates,” with a course description that read “The object of this course is to give the student the widest possible acquaintance with the animals which live along shore and in the plankton of Monterey Bay, their classification, associations, distribution and habit.”²

For the summer quarter of 1920, this course again offered by WK Fisher, was presented with a broader description. "The Classification and Ecology of Marine Invertebrates. — The object of this course is to give the student the widest possible acquaintance with the animals which live along shore and in the plankton of Monterey Bay. While an extensive knowledge of invertebrate forms is aimed at, some one group, in which the student becomes interested, will be studied more intensively. The prescribed work will also include a study of the associations of animals, their distribution, and something of their behavior, or simple reactions. Each student will collect much of his own material in the field. 5 units, Fisher (Summer Quarter 1920) & Zoology Research. — Research or special work in the fields of morphology, taxonomy, ecology, and embryology. (FISHER, STARKS)³” This course, The Classification and Ecology of Marine Invertebrates,” was then repeated during the summer quarter of both 1921 and 1922.

Beyond Fisher's class in "The Classification and Ecology of Marine Invertebrates," other courses were offered in the coming years that applied the early
concepts associated with ecology. For example, during the summer of 1924, a Dr. Lourens G. M. Baas Becking and Miss Emily Bartlett presented a course in marine plants. In the departmental report for Hopkins Marine Station, the course was described as: "intended chiefly as an introduction to a general biology of the algae and not as a taxonomical or anatomical review of the groups. The physiology of the various types was emphasized. Collecting trips to various points along the coast gave the students an idea of ecological zonation. Considerable material was added to the station herbarium and a collection of 50 representative types was preserved in formalin."

The beginning years of the second decade of Hopkins Marine Station witnessed an increased effort directed toward the instruction of marine ecology. In 1929, George MacGinitie, having recently completed his Masters degree (M. A.) at Stanford University, was appointed to the position of Instructor at Hopkins Marine Station.

George MacGinitie’s *Shore Ecology* class of 1930
Photograph Courtesy of Stanford University Archives
MacGinitie was a perfect fit for the instruction of field ecology as the research associated with his Master's thesis had focused on ecological aspects of Monterey Bay’s large marine estuary, the Elkhorn Slough. During the spring quarter of 1930, George MacGinitie offered a course titled *Shore Ecology* (545) for elementary students, repeating the course for advanced students during the summer quarter. 

George MacGinitie’s *Shore Ecology* class of 1930 visiting the Elkhorn Slough. Photograph Courtesy of Stanford University Archives.

The course description for MacGinitie’s *Shore Ecology* (545) read: “A course primarily for biology majors designed to give an understanding of animal communities and the life activities of individual members of these communities in response to certain environmental factors. Prerequisite: a course in general zoology. Limited to eight students.” MacGinitie again offered this course, *Shore Ecology* (545), in the spring of
1931 for elementary students, repeating the course during the summer for advanced students.\(^7\)

George MacGinitie’s *Shore Ecology* class of 1931
Photograph Courtesy of Stanford University Archives

MacGinitie's research directed toward understanding the ecology of mudflats of Elkhorn Slough, which he extended into 1931, became incorporated as part of the field portion of his class. In the spring quarter of 1932, a course titled *Marine Zoology* (510), co-instructed by MacGinitie and Fisher, was described as *an introduction into the general zoology and ecology as illustrated by animals of the Monterey Bay.*

In the summer quarter of 1932, a course titled *Marine Ecology* was offered by George MacGinitie with a description that read: *Animal associations with particular attention to physical chemical environment; ecological interrelationship of species; life histories, especially in relation to environment.*\(^8\)
The following summer, with George MacGinitie having taken a position with Kerckhoff Marine Laboratory of the California Institute of Technology, an effort was directed toward preparing Rolf Bolin to be instructor of the marine ecology course. As suggested in the paragraph to follow, Bolin was provided an in-depth introduction to the rocky intertidal by Stanford graduate student, Willis Hewatt.

According to WK Fisher in the departmental report for 1934, *a new course in the ecology of marine organisms necessitated considerable research for materials and appropriate stations. In this Dr. Bolin was aided by Mr. Willis G. Hewatt, who has become familiar with this field during the progress of his work on a doctoral dissertation.*

The summer quarter of 1936 saw instruction of three inter-related courses directed at the ecology, anatomy, taxonomy and natural history of marine invertebrates; a collaborative effort by Professors Rolf Bolin [*509. Ecology of Marine Organisms*], WK Fisher [*510. Natural History of Marine Invertebrates*] and Rolf Skogsberg [*540. Marine Invertebrates*] with course descriptions that read:

509. *Ecology of Marine Organisms.*—A field study of typical marine environments and of animal and plant communities; studies of adaptations and life activities of individual members of these communities in response to certain environmental factors. This course may be taken profitably in connection with Course 510 or 540, which are primarily laboratory courses. Open to elementary student. 5 units (BOLIN) MWF forenoons.

510. *Natural History of Marine Invertebrates.*—A comprehensive survey of the field designed for students who desire to add to their knowledge of animals rather than to train for advanced professional work. Open to elementary students. 5 units (FISHER, DEICHMANN, CLARK). TThS afternoons.

540. *Marine Invertebrates.*—An advanced' professional course dealing with the anatomy, taxonomy, and natural history of the more important phyla. Collateral field studies are provided by Course 509. Elementary students will elect Course 510. 5 units (SKOGSBERG) TThS afternoons.
The summer quarters of 1938, 1939 and 1940 saw instruction of two inter-related courses, offered by Skogsberg and Bolin, directed at the ecology, anatomy, taxonomy and natural history of marine invertebrates. 11,12,13

511. Marine Biology.—This course (511a and 511b) furnishes a survey of oceanic invertebrates, and their environment, as an essential part of the field of general biology. It is divided into two sections either of which maybe taken independently. Open to elementary students.

511a. Ecology of organisms of the open sea; the fundamentals of biological oceanography; anatomy, taxonomy, and natural history of the more important phyla. 5 units (SKOGSBERG) TThS afternoons.

511b. Ecology of shore and bottom animals; a study of classification and adaptations of one or more large phyla not covered by 511a. This course includes much of the field of Course 509 [Ecology of Marine Organisms]. spring quarter. 5 units (BOLIN) MWF forenoons.

Rolf Bolin continued to offer this course of instruction as to the ecology of marine organisms, through 1941. William D McElroy's, a pioneering research biologist who became UC San Diego's fourth chancellor, provided a remembrance of Bolin's course which he attended during the summer of 1941 -- We also took the invertebrate course (the microbiology course met three days a week) with excellent lectures and formal collecting by Professor Rolf Bolin. This required rising at 3:30 or 4:00 A.M., depending on the tides, to collect organisms from a defined niche in the environment and then returning to the laboratory to classify the organisms and to hear Professor Bolin lecture about what we had presumably learned from that morning's collection... The invertebrate course at the Hopkins Marine Station was taught by Professor Rolf Bolin. He was a very good friend of John Steinbeck and Edward Ricketts. Those who have read Cannery Row will recall that Steinbeck developed a fictional character based on Ricketts. All of us were excited when Steinbeck invited the invertebrate class to an afternoon picnic and
evening affair at his home. He was personally interested in marine biology and at every opportunity he encouraged the people at the Hopkins Marine Station.\textsuperscript{14}

In 1942 Rolf Bolin and Walter K Fisher presented a course titled \textit{Natural History of Marine Animals} (501), which was offered for the next two years during the summer quarter: The following is a description provided for this course: \textit{This course (501a and 501b) will provide a contact with varied aspects of the life of the ocean. It is intended for students who have not formally studied zoology and for biology students who desire a general survey rather than an intensive treatment of the subject.}\textsuperscript{15,16}

501a. \textit{A field study of typical marine environments and of animal and plant communities; studies of adaptations and life activities of individual members of these communities in response to environmental factors.} 5 units (BOLIN) MWF forenoons

501b. \textit{Concerned with oceanic invertebrate animals in respect to structure, classification and evolution.} 5 units (FISHER) TThS afternoons

In 1944, Rolf Bolin began to offer a class titled the \textit{Ecology of Marine Animals} (Course 501) which required a prerequisite of General Biology or Zoology or concurrent registration in \textit{Marine Zoology} (Course 502) taught by Tage Skogsberg.\textsuperscript{17} The following paragraphs present the course description for each of these classes.

501. \textit{Ecology of Marine Animals.}—Lectures, laboratory and field work in ecology of marine animals. The course provides the opportunity for the student to visit several different types of marine habitats, to become acquainted with about 400 named species of living marine animals representing most of the known phyla and classes, and to examine more carefully about 100 forms. Stress is placed upon the adaptations which fit the organisms for life in a particular habitat. Prerequisite: General Biology or zoology (or concurrent registration in Course 502). 5 units (BOLIN) MWF (all day).

502. \textit{Marine Zoology.}—Deals with the structure and classification of marine invertebrates. The material is treated in a relatively general manner, and representatives
of as many as possible of the basic classificatory units are included. No prerequisites. (See Course 540.) 5 units (SKOGSBERG) TThS (all day).

With Rolf Bolin's course 501 schedule for Monday-Wednesday-Friday, all day and Tage Skogsberg's course 502 scheduled for Tuesday-Thursday, all day, ensured a student was immersed in the study of marine invertebrates and ecology five days a week.

As described by Bill Utley who attended the summer session at Hopkins Marine Station (1957) and enrolled in the Ecology of Marine Animals course, it appears that Bolin was applying 1) Hewatt's work within the intertidal zone of Hopkins Marine Station, 2) MacGinitie's work in Elkhorn Slough and 3) the research he had conducted, as part of the Hydrobiological Survey. "In this class we became familiar with over 400 species, and tried to learn the specific ways in which some of them are adapted to their environment. We collected from the rich tide pools around the Pacific Grove area, the sandy beach, Elkhorn Slough, the tide rips in the bay, and conducted plankton hauls in Monterey Bay. It was an unsurpassed opportunity to see the more common, and some of the rarer, forms of marine fauna."¹⁸

Rolf Bolin taught his course, the Ecology of Marine Animals during the summer quarter at Hopkins Marine Station through 1961, at which time Dr. Eugene Haderlie took up the role of instructor.
EARLY TAXONOMIC STUDIES AND THE GREAT TIDEPOOL

Efforts to determine the taxonomic identity of the marine invertebrates associated with the Monterey Bay region began long before the establishing of Hopkins Marine Station in 1917, and even prior to the establishing of Hopkins Seaside Laboratory in 1892. For assistance with the identification of species, taxonomic specialist positioned at the United States National Museum (USNM) were enlisted very early in the process. A query of the Smithsonian's invertebrate collection shows the earliest contributions to the USNM collection of marine invertebrates from Monterey were echinoderms and arthropods specimens collected in 1872 and 1874 by the famous American naturalist, William Healey Dall.\textsuperscript{19} The next contribution from the Monterey region was in 1880, when David Starr Jordan, during his survey of the fish and fisheries of the Pacific Coast, sent along contributions of echinoderms, arthropods and molluscs from Monterey to be accessioned into the USNM invertebrate collection. Contributions of gastropods from the Monterey region to the USNM invertebrate collection by Frank Mace MacFarland begin in 1894; in 1905 MacFarland noted the precise location of his contribution as having been collected from "Monterey Bay, Point Pinos, The Great Tide Pool." From that year forward, numerous contributions were accessioned into the USNM with the precise location of collection noted as "Point Pinos, The Great Tide Pool." Many of these contributions came from Frank Mace MacFarland, others from George MacGinitie and Max W. De Laubenfels.

Those invertebrates collected from the Point Pinos region of the Monterey Bay and accessioned into the USNM were then identified by taxonomic experts, each of whom were specialists of particular taxon (S. S. Berry for Cephalopods, A. H. Clark for Crinoids, H. L. Clark for Ophiuroids, W. R. Coe for Nemerteans, Max W. De Laubenfels, for Sponges, Elisabeth Deichmann for Holothuroids and Octocorals, Walter K. Fisher for Asteroids, Echiura (Spoon Worms) and Sipunculids, C. M. Fraser for sessile Hydrozoans, Olga Hartman for Polychaetes, Waldo L. Schmitt for crabs and Walter M. Tattersall for Mysipids). It is no small coincidence that each of these aforementioned taxonomic experts assisted the eminent ecologist, Edward F. Ricketts in identifying invertebrates he collected, thereby collectively supporting his effort to gather the information presented in the books, \textit{Between Pacific Tides} and \textit{Sea of Cortez}. 
EARLY ECOLOGICAL RESEARCH AT HOPKINS MARINE STATION

Within the first decade of establishing of Hopkins Marine Station at China Point, one finds a number of student’s research efforts directed toward studying the ecology of the local marine environment. These first studies were directed toward understanding the basic ecology associated with a single genus or species as opposed to understanding the ecology of a community of marine animals.

BARNACLES

The first of these projects, initiated during the autumn quarter of 1918 by Miss Olive Mildred Willoughby, entailed a study of the barnacles associated with the rocky intertidal of Pacific Grove, with WK Fisher as her primary advisor. This study became the focus of Miss Willoughby's Masters thesis, "The Barnacles of Monterey Bay" which, along with comprehensive description of the taxonomy of barnacles, contained a seven-page section outlining the ecology of the barnacles. Within this section is presented a simple detailed account of the distribution of the various barnacle species observed at three separate locations along the shoreline of Pacific Grove (Point Pinos, Point Aulon and Almeja Point) with a specific and descriptive reference to their position within the high, mid and low littoral zones. Also addressed in the simplest of terms is the influence of wave activity and intensity, (i.e. wave shock) in relation to the distribution of individual barnacle species. Olive Mildred Willoughby graduated from Stanford, A. B. Zoology, 1918, A.M. Zoology 1919.

CALIFORNIA SPONGES

In 1924, Max Walker De Laubenfels, as a Stanford graduate student, began a taxonomic and ecologic study of the sponges of the region, with WK Fisher as his primary advisor. Completed in 1926, Max De Laubenfels Master’s thesis, titled "The Sponges of Monterey Bay," contained a two-page section specifically titled “Ecology of Sponges” followed by a one-page section titled "Distribution of Sponges." Next for Max W. De Laubenfels, was the completion of his Ph. D. thesis from Stanford University, which was a taxonomic study of California sponges titled “The Sponges of California”
(1929), again with WK Fisher serving as his advisor. Though De Laubenfels Ph. D. dissertation lacked any discussion on the ecology of the organisms, he became a leading authority on the ecology of marine sponges.

**ECOLOGY OF A COASTAL ESTUARY**

In 1926, George E. MacGinitie began his intensive study of the community ecology of a mud flat estuary, centered in the middle of Monterey Bay. This study became the focus of MacGinitie's Masters thesis, titled "Ecological Aspects of Elkhorn Slough" completed in 1927. Also during 1926, Miss Nettie L. Murray began her study of the ecology of mud-loving Crustacea, using Elkhorn Slough as a location to focus her research. Completed in 1926, Nettie Murray's Masters thesis was titled The morphology of the crustacean Callianassa californiensis Dana. George E. MacGinitie and Nettie L. Murray soon married, forming a partnership whose life work was directed toward understanding the shoreline biology and ecology of marine animals of the Pacific coast. The MacGinitie's work in Elkhorn Slough applied a much broader "community level" approach to understanding the ecology of a marine ecosystem than had ever been conducted before along the Pacific coast.

As describe by MacGinitie in the *American Midland Naturalist*, (1935): "The work was carried on over a period of eight and one half years (June, 1926 to January, 1935), and was done to obtain a comprehensive view of animal life as a whole, particular attention being given to the relation of one species to another, and the adaptation of each species to its environment."23

**AN INDIVIDUAL SPECIES OF MARINE AMPHIPOD**

During the summer quarter of 1926, Tage Skogsberg, in collaboration with Mr. George H. Vansell, researched the morphology and ecology of an individual species of marine amphipod common to the tide pools of the Monterey Bay.24 It is of interest to note that Skogsberg collaborator, George H. Vansell, was instructor of entomology and apiculture (bee-keeping) at the University of California, Davis, a position he held from 1922 to 1931.
Skogsberg and Vansell's paper, *Structure and behavior of the amphipod, Polycheria osborni*, was published in the Proceedings of the California Academy of Science in 1928. The paper presented, in great detail, the habits and behavior of *Polycheria Osborni*. In the opening of this paper Skogsberg describes their inquiry of the amphipods habits and behaviors as follows:

"When compared with the social insects, most crustacea undoubtedly have a very simple ecology. However, in many cases the great simplicity may be apparent only and due to our lack of detailed information. It should be remembered that, to a very large extent, this field of inquiry is still a virgin one, and the future investigations probably will reveal much complexity of habits and behavior where simplicity anticipated. Indeed, some crustacea are known to have ecological features of great interest."26

According to John Milton Foster (2008), the publication by Skogsberg and Vansell provided the most comprehensive behavioral and ecological account of a species of amphipods within the family Dexaminidae that has been achieved to date. 27

**OUTER SHORES OF MONTEREY BAY**

In 1929, working in conjunction with the California State Fish and Game Commission, Tage Skogsberg and other faculty members positioned at the Hopkins Marine Station (i.e. Walter K. Fisher, Harold Heath, and George MacGinitie) began a collaborative project known as the Hydrobiological Survey. As described by WK Fisher, the research efforts associated with this program were directed toward understanding: (1) the hydrography of Monterey Bay; (2) the ecological distribution of the planktonic organisms of this Bay correlated with hydrographical data; (3) life histories and migrational habits of the fishes of this region based upon plankton studies; and (4) deep-water investigations outside of Monterey Bay. The data thus obtained will serve as the basis for ecological studies of seasonal and annual distribution of the plankton of Monterey Bay. 28
The Hydrobiological Survey ran for almost a full decade (1929 to 1937), with those investigators supporting the research provided working space in the Alexander Agassiz Laboratory at Hopkins Marine Station.

In addition to completing the routine chemical analyses associated with the Hydrobiological Survey, Miss Lucina Stanford took up for her Masters thesis, in 1929, with a study of the Ctenophores of Monterey Bay. Quoting Fisher: *Although in the beginning, Miss Stanford's work of necessity has been taxonomic and morphological; the emphasis of her research will become increasingly ecological, aiming at an understanding of the seasonal and diurnal migrations of these forms as well as of their general behavior.* In 1931, Lucina Olive Stanford was awarded a Masters Degree in Biological Science from Stanford University. Though WK Fisher had enthusiastically suggested that Lucina Stanford would address the ecology of ctenophore species of Monterey Bay, her Masters thesis was limited to detailed taxonomic descriptions of those that were encountered.

In an article that appeared in 1936 in the *Transactions of the American Philosophical Society* titled *Hydrography of Monterey Bay, California. Thermal Conditions, 1929-1933,* Skogsberg provided the reason for the slow pace toward understanding the ecology associated with the waters of the Monterey Bay, that being the result of nearly a complete lack taxonomic and systemic identification of the planktonic species. *"In regard to the biological aspect of the program, which is concerned both with planktonological and fisheries ecological questions, it must suffice to mention in this connection that this part has been assigned so far nearly exclusively to students working towards advanced degrees at Stanford University. In the field of planktonology, unfortunately, the fauna and flora are so inadequately known that a fairly long period of largely descriptive work must precede the broader ecological and geographical problems. The same holds true in respect to the investigations of the deep sea organisms."*
COMMUNITY ECOLOGY OF THE ROCKY SHORES

In the year 1930, George MacGinitie, with Tage Skoksberg and WK Fisher continuing to serve as primary advisors, began supervising the work of Mr. Willis Hewatt, a student with, what Dr. Fisher referred to as a "Ph.D. problem" in the field of marine ecology. In Hewatt's hand typed dissertation, he thanks George MacGinitie "for having suggested the problem and for his aid in starting the project." Hewatt’s Ph. D. problem related to an investigation of the community ecology of a portion of the rocky shore associated with Hopkins Marine Station.

In the department report provided for the Annual Report of the President of Stanford University for 1930, WK Fisher provided a detailed description of the research associated with Hewatt's dissertation, which reads: During the summer quarter of 1934, Willis G. Hewatt continued, under the general direction of Dr. Skogsberg, his ecological investigations on the littoral (i.e. intertidal) fauna of a selected region located along the southern margin of Monterey Bay. This study was begun in 1931 and was presented in the form of a doctoral dissertation at the end of the summer of 1934. The report included a qualitative and quantitative survey of an ecological transect, one yard wide and 108 yards long, across the intertidal area adjacent to the Hopkins Marine Station. Upon the basis of the accumulated data the littoral of this area was divided into four vertical zones. The physicochemical environment was studied and was found to be very monotonous except in the case of the tidal variations and exposure to surf action. The physical and biotic factors which appear to cause the zonation of the organisms were pointed out. The specific ecology of several species of animals was also presented, with particular emphasis upon the inter-relationships which limit the species within the intertidal area. Notes on the breeding habits and the dates of the spawning periods of fifty-two species of intertidal animals were presented. Willis Hewatt completed his Ph. D. dissertation "Ecological studies on selected marine intertidal communities of Monterey Bay" in August of 1934.

Within his dissertation Hewatt provides insight for the absence of research focusing on the ecological aspects of the littoral community as a whole: A survey of the literature published on the littoral faunas of the California coast reveals that, until the present time, practically all of the work, has been of a taxonomic, morphological and
embryological nature. The ecological aspect has been greatly neglected. It is true that scattered facts concerning the specific ecology of some of the animals are to be found in these papers and that the ecology of a few species has been dealt with in quite an exhaustive manner, but not a single paper dealing primarily with the sociological aspect of the littoral communities has been published.\textsuperscript{35}

In addition, Hewatt mentions the necessity of the systematic classification of the intertidal animals to be completed to a level that allows for ecological research at a community level to begin: The state of affairs is, of course, the natural consequence of the fact that the California coast was not available to biologists until, comparatively speaking, very recently. Sociological research must necessarily be preceded by a fairly complete taxonomic survey, in order that the ecologist be provided with the means of correctly identifying the forms with which he works. With the exception of a few groups, the systematic classification of the intertidal animals of the central California coast has reached a degree of perfection which permits effective ecological work to be continued.\textsuperscript{36}
KELP FOREST COMMUNITY ECOLOGY

Following on the heels of Willis Hewatt's research in the littoral zone, was one of the earliest known investigations related to the ecology of the kelp forest community. As described by WK Fisher in the departmental report for 1935: "Mr. H. L. "Harry" Andrews, of the Junior College of the City of Chicago (West-side), continued a study of the ecology of animals in the kelp beds of Monterey Bay. Collections were made throughout the year 1934-35 to determine the seasonal distribution of forms inhabiting the kelp beds. The study shows a downward extension of forms formerly thought to be tidepool animals. The kelp holdfast seems to be a nursery for many species in their early stages. Food, protection, current, are factors in the habitat. There is a definite zonation in the holdfast. Certain forms migrate to the holdfast during the egg-laying period. Some forms carry eggs throughout the year, indicating a longer breeding season than was previously known. Andrews took into account the influence of pH, currents, and the relation of animals to plants, to describe the kelp forest communities of the Monterey region in terms of ecological succession. With Victor Shelford serving as his primary advisor, and Frederic E. Clements and B. Vincent Hall as members of his committee, Harry Andrews received a Ph. D. from the University of Illinois in 1938, having completed a thesis dissertation titled *An ecological study of living forms in the kelp beds of Monterey Bay and Carmel Bay, California : with suggestions as to the hydroclimatic influences.*
The teaching and research efforts of an ecological approach outlined above allows one to recognize the activities taking place at the Hopkins Marine Station during the period that Edward F. Ricketts, operator of the Pacific Biological Laboratories was at work on the manuscript of the book *Between Pacific Tides: An Account of the Habits and Habitats of Some Five Hundred of the Common, Conspicuous Seashore Invertebrates of the Pacific Coast Between Sitka, Alaska, and Northern Mexico by Edward F. Ricketts and Jack Calvin* (1939). The comments offered by several of these investigators - relating to their early struggles with the taxonomic identification of marine invertebrates of the Pacific Coast - lends further insight to the state of the science of west coast marine invertebrate zoology during this time period.

The extraordinarily diverse flora and flora common to Monterey Bay region presented a significant challenge to those scientists attempting to ask questions of an ecological nature, including Ricketts himself. In the chapter to follow, will be recognized, the efforts of scientists associated with Hopkins Marine Station and invertebrate specialists associated with USNM, who supported Edward F. Ricketts quest to present an overview of the habits and habitats of more than five hundred marine invertebrates common to the Pacific Coast from Northern Mexico to Sitka, Alaska.39