

DOWNLOAD PDF THE BOUNDARIES OF THE REGION TRANSITIONAL TYPES

Chapter 1 : Biogeographic region - Fauna | blog.quintoapp.com

Are there always clear-cut boundaries from one region to the next? To answer those questions, let's look closer at three common types of regions in geography: formal, functional, and vernacular.

Geographic subdivisions Citation for the whole project: Jepson Flora Project eds. Formulating such predictions can be a challenge, especially in a large state with the topographic complexity and climatic and habitat diversity of California, where sizable areas remain insufficiently explored botanically. To enhance the effectiveness of geographic data in predicting plant occurrences, a system was developed for The Jepson Manual, or TJM , that departed from the widespread practice of simply listing the counties in which a taxon is known to occur or indicating those counties on a map. The geographic system used in TJM , slightly modified here, combines features of natural landscapes and biota to delimit the units, as opposed to using the often arbitrary and unnatural boundaries of counties for that purpose. The Jepson geographic system most importantly reflects broad patterns of natural vegetation and, at a finer scale, more specific plant assemblages , geology, topography, and climate. Patterns of vegetation and flora that influenced the Jepson geographic system were drawn largely from A. Major, eds, Terrestrial Vegetation of California, J. Minor refinements of the geographic system in JM II were based on improved resolution of boundaries as described in TJM or on adjustment of those boundaries in light of additional geographic and vegetation data from satellite photographs and other sources, and from finer-scale adherence to elevational criteria, where appropriate. For further, detailed information on Californian vegetation, see J. The Jepson geographic system is organized hierarchically, starting with broadly defined provinces and ending with districts third-order subdivisions of provinces. Directional modifiers on the geographic units, e. Combining geographic range statements with habitat descriptions and elevation ranges increases the predictiveness of overall range statements. There are 50 geographic units in this system. Each has a unique abbreviation, used in descriptions and keys. If a user is already familiar with California geography, the units and their abbreviations may be readily understood. Each of the 50 units is defined and described below. These descriptions will be easier to follow if studied in conjunction with the map and hierarchical outline of subdivisions. In some cases, counties are indicated parenthetically after a geographic unit in the range statement to provide more distributional detail for units that span multiple counties. This was frequently done for rare plants because county-by-county information is often sought for them. The system of geographic units is four-tiered: There are three provinces at the most inclusive level. All three extend outside of California but the California Floristic Province includes most of the state and only small parts of adjacent Oregon, Nevada, and Baja California, Mexico. The other two provinces are the Great Basin and Desert. Each province is subdivided into regions. The California Floristic Province is made up of six regions; in California, each of the other provinces has two regions. Together, these three provinces and ten regions delineate the broad physiographic and biologic geography of California. Provinces and regions are shown most clearly on the "exploded" inset map. Like California as a whole, most of the units are elongate in a more or less north-south direction. Nine of the ten regions are further divided, into a total of 20 subregions 1â€”4 subregions per region. Subregions are based on topographic, climatic, and vegetation variation within the region. Seven of the subregions are further divided into districts, based on more localized environmental variation. In contrast to the use of arbitrary, often politically determined delimiters, such as county lines, the use of biologically meaningful criteria to delimit geographic units results in sometimes frustratingly indefinite or fuzzy boundaries. Wherever possible, subdivisions are defined on the basis of all three of the main biologically relevant variables: These three variables do not always shift in concert, and in such cases vegetation differences generally take priority. In other situations, transitions in vegetation occur gradually and there is no apparent botanical basis for drawing a sharp line. Where this occurs, boundaries were established primarily using a combination of geological and topographic criteria e. The CA-FP includes all of the "cismontane" region, as used by Jepson, Munz, and others, in addition to the adjacent, leeward, high

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montane slopes of the westernmost "transmontane" region of those authors; the GB and D together contain the remainder of the transmontane region. Vegetational, topographic, and geologic boundaries are all indistinct in the north; there are inclusions of sagebrush steppe in the Cascade Ranges an especially large one in Shasta Valley in north-central Siskiyou County and of montane forest at higher elevations in the GB. In the Cascade Ranges, volcanic cones and mountains are more numerous, while in the GB the terrain is generally flatter, with a greater predominance of lava flows that have been faulted into small mountains with intervening basins. There is a floristically interesting indentation of the boundary at Sierra Valley Plumas and Sierra counties, which is included in the Modoc Plateau. Montane vegetation in the southeastern Sierra Nevada, northeastern Transverse Ranges, and eastern Peninsular Ranges "all in the CA-FP" tends to grade into desert vegetation on the lower slopes of these mountains in the transition to the D. In California, the CA-FP is divided into six regions, 17 subregions, and 17 districts, as described below. This region has the wettest and most predictable climate in California. From southwestern Solano County, the southern boundary of the NW turns westward along a vegetational boundary that excludes salt marsh, coastal prairie, and other maritime communities of the Central Western California Region CW to the south, and then proceeds through southern Sonoma County to the Pacific Ocean near Bodega Bay. The NW is divided into three subregions. North Coast Subregion NCo. In some places e. Klamath Ranges Subregion KR. The California portion of this geologically old and distinct, serpentine-rich subregion is bounded to the north by Oregon and in the northwest by the coastal vegetation of the NCo. This fault boundary generally coincides with the northwest-flowing Klamath and South Fork of the Trinity rivers. The transition in forest types across the boundary between the KR and NCoR is gradual, with the KR containing forests of globally exceptional conifer diversity. In the east, the boundary between the predominantly metamorphic KR and the volcanic CaR lies east and north of Shasta Lake, incorporating the McCloud and Hosselkus limestone formations. Red Mountain, near the point where Trinity, Shasta, and Tehama counties meet, is one of the southernmost peaks in the KR that exceeds m. This subregion is the largest in the NW and includes widespread serpentine. It is divided into three districts: This district, the largest in the NCoR, is characterized by very high rainfall, as well as by redwood, mixed-evergreen, and mixed-hardwood forests. This district is characterized by heavy snow cover, as well as by montane and subalpine conifer forests, treeless high peaks, and floristic similarities to the SNH. Somewhat lower, more western, and more isolated peaks similar in vegetation to South Fork Mountain e. It extends from the Anderson area in southwestern Shasta County, southward along the east slope of the North Coast Ranges, with a conspicuous westward bulge near the southern end of the NCoRH, to an area west of the Russian River from north of Ukiah south to Mount St. Serpentine is widespread in the NCoR, but especially common in this district. This region, characterized by volcanics, is bounded to the north by Oregon, to the west by the predominantly metamorphic KR, to the southwest by agricultural land or grassland of the GV, to the southeast by the Sierra Nevada Region SN, and to the east by the juniper woodland of the GB. The interface between the CaR and SN is defined geologically by the contact between the relatively recent volcanics of the CaR and the predominant metamorphics with both granitic intrusions and volcanics of the northern SN n SN. This contact, located slightly northwest of the canyon of the North Fork of the Feather River, serves as a reasonably distinct topographic marker. The geologic and topographic aspects to the interface between the CaR and SN are not reflected in any vegetational change; rather, the forests of these regions change gradually with latitude. The CaR is divided into two subregions. This primarily igneous region meets the volcanic CaR to the north. Each of the two larger subregions is divided into three districts northern, central, southern along contiguous, more or less east-west lines. Although vegetation changes more or less gradually with latitude in the SN, the lines between the northern, central, and southern districts were chosen, somewhat arbitrarily, to coincide with areas of more or less abrupt floristic transition and with major rivers or drainage systems. The upper elevational limit of the SNF is approximately m in the north to m in the south except near Lake Isabella, where the upper limit is approximately m. It is best differentiated from the SNH and GV by vegetation, as opposed to climatic, topographic, geologic, or other considerations. The SNF is divided into northern, central, and

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southern districts, as discussed under the SN, and as defined under each. This district meets the CaRF to the north northwest of Oroville and is bounded more or less arbitrarily in the south, where it meets the c SNF, by the Stanislaus River, which corresponds to the Calaveras-Tuolumne county line. This district meets the n SNF to the north and is bounded in the south by the divide in Fresno County between the San Joaquin and Kings river drainages, which is approximated by Highway The district runs the width of the SN at its southern end i. This district meets the n SNH to the north, as defined above. The southern boundary, west of the Sierran crest, is the divide between the San Joaquin and Kings river drainages as it is in the c SNF. This divide winds to the south in eastern Fresno County, reaching the Sierran crest along the Goddard Divide, near Mount Darwin m. In this area, peaks average about m, while in the southernmost part of the district this figure is " m. The boundary with the s SNF in the south, defined by vegetation, is convoluted and relatively indistinct. The higher mountains of the southern part of this district e. Tehachapi Mountain Area Subregion Teh. This small foothill and montane subregion, in which elevations rarely exceed m, has floristic elements of all surrounding geographic units. In the west, the subregion is bounded by the GV, where included foothill and mixed-woodland vegetation meets grassland and agricultural land. This region is an elongate, north-south oriented lowland surrounded by all other regions of the CA-FP but bordered mostly by coast ranges to the west and the SN to the east. On all borders i. Although now predominantly agricultural, the GV still supports some grasslands, marshes, vernal pools, riparian woodlands, alkali sink vegetation, and stands of valley oak. Toward the southern end of the GV, some desert elements occur. The region is divided into two subregions. Sacramento Valley Subregion ScV. This subregion comprises the northern, smaller, wetter, cooler area of the GV, extending from near Red Bluff in Tehama County to the salt marshes of Suisun Slough in southwestern Solano County. This subregion comprises the southern, larger, drier, hotter area of the GV; its northern limits are defined under the ScV, while its other boundaries equal those of the GV. Many, often small outcrops of serpentine are scattered throughout the region. The CW is divided into three subregions, one of which comprises two districts. Central Coast Subregion CCo. Salt marshes and coastal prairie occur around the San Francisco Bay; coastal-sage scrub is prevalent in the south. This subregion occupies the northern one-third of the CW, east of the CCo. It is divided into two districts. Near the coast, there are small stands of redwood and mixed-evergreen forests in the north, and oak forests in the south, with pockets of montane conifer forest at the highest elevations.

Chapter 2 : Ecotone - Wikipedia

Geographical transition zones, also called regional boundary or boundary lines, separate nations, form social distinctions and divide political areas.

I would like to take this opportunity to express my sincere gratitude and deep regard to my guide, Ar. Vandini Mehta, for her exemplary guidance, valuable feedback and constant encouragement throughout the duration of the dissertation. Her perceptive critiques kept me working to make this dissertation better. Working under her was an extremely knowledgeable experience for me. Besides my guide, I would like to thank my mentor, Ar. Thomas Oommen, for his insightful comments and assistance during the initial, decisive stages of the research that helped me frame and direct my dissertation. His valuable suggestions were of immense help. I would also like to thank our dissertation coordinators, without whose hard work the dissertation would not have been successfully complete. The time table and the reminders helped me immensely, in managing my time along with the other subjects. Lastly, I would like to thank my family for their moral support and encouragement throughout the semester.

Diagram explaining the relationship between public- private and open- closed transition spaces. Anup Talao, Fatehpur Sikri, with the platform in the centre. Threshold of a haveli. The courtyard inside a haveli. Plan of the Ranganathaswamy Temple, Srirangam. The interior courtyard of nalukettu. Entrance at the Buland Darwaza, Fatehpur Sikri The image shows the cluster of houses in the Aranya Township. The image shows the basic layout of the Aranya housing development. The different types and level of activities in the ota. An ota without any boundary. An ota with a boundary wall. House in Aranya Development showing different otlas Plan of Institute of Indology The garden and the entrance. Plan of the Belapur Housing. Formation of the plan from a single unit to the settlement. Small Courtyard town serving houses. Community Park at a development level. Landscape of Bharat Bhavan. The different courtyards in the premise. The galleries of Bharat Bhavan. The exterior is simple leading to greater levels of mystery surprise and memory, creating poetic changes of light and shade. An architectural space is incomplete without transition spaces. The inclusion of transitional and circulation spaces, in the form of corridors, atriums and stairwells, is unavoidable in the design of most buildings. Their functionality also varies according to the appropriate requirements of the building or the user. The spaces could create subtle interconnections which can be exploited and temporal experiences could be defined through architectural interpretation of transitional spaces. Looking at Indian architecture, there are features like pavilions, courtyards, terraces, and thresholds which accentuate transition. All of these features come together to articulate the space. The elements can be used in buildings of many typology or function, such as, temple, palaces, ghats, residence, institutional buildings, etc. The listed features might show anonymity in their existence but their true meaning emerges from the context and its use. We will look at the use of these features, in detail, later in the dissertation. We transit so often that we are not even conscious of that space being there. It is very interesting to know about it. We experience them from macro to micro levels, while being completely unaware of its presence. Therefore, in order to understand transition spaces, I would like to do an in depth study of how such spaces came up, their evolution, hierarchy and to analyse their role and importance. The dissertation examines the various transitional spaces used in Indian Architecture by investigating the works of architects like B. Doshi and Charles Correa. The aim will also be to derive how these transition spaces have lend Indian-ness to buildings, their different typologies and variation according to the function of the building. The dissertation will include case studies of the philosophies and various projects of these architects. I have chosen these particular architects as both of them try to identify Indian identity and introduce it in their projects. Through their projects I will be able to understand the various transition spaces that they have integrated and it will allow me to analyse the expression of Indian identity. If we look at the definition of a transition space, it is a space of experience between the inner and the outer worlds; an intermediate or a third space. They act as both a buffer space and a physical link. Other than being functional as circulatory routes for the building, the designs of

these spaces is considered very important by building designers for reasons of aesthetics, health and comfort, and as exit routes in the event of an emergency. A transition space not only acts as a link between open and closed spaces, but also is a link between private and public areas; serves as a delicate transformation between the public and private domains of urban residential buildings. The transition space, therefore, is neither wholly private nor public, neither external nor internal. It should be viewed in its plurality. At one level, it is an architectural solution to the problem of connecting the residence to the street or the public premise. On the other level, it is full of social meanings signifying welcome, auspiciousness and prominence. Such spaces have a different impact on people who are passing through them than the areas which are outdoors or fully indoors. These transition spaces or the thresholds in architecture a building or its premise can be created by the change of light, a change of sound, a change of direction, a change of surface, a change of level, perhaps by gateways which make a change of enclosure and above all with a change in view. It is quite interesting to draw a comparison between transitions in the field of architecture and transitions as a sociological moment. For example, the situations most commonly associated with the phenomenon of transition are death and mourning. The rituals surrounding death used to be qualified by a series of events spreading into time in order to make each death more bearable. Now this transition moment or threshold between our life before and after is supposed to last not months but instants. Theoretically, it symbolizes the transition point between the outer world of the senses and the inner world of the spirit; a transition between the inside and outside. I think there is a similar process in architecture, the process of entering or leaving; the transitional quality of spaces, however, is often under addressed and weak. The richness of a building should be judged mainly by the transition experiences it proposes. In the way it suggests rituals that guide you through a journey of exploration. The space should be understood as an event, a gradual transition towards a more inclusive interiority. In a public setting, they may vary in scale but they succeed in creating a fluid and elastic outdoor space. A transition space began with and still is the element of transit between the public street and the private house domains considered to be irreverent and sacred, respectively. It is the first point of contact of the house with the outside. It becomes a centre for informal gatherings of small groups adding life to the street. Therefore, we can say that after an individual building and its premise the next level of transition happens at the intersection of streets primary, secondary and tertiary. This type of hierarchy of transition spaces is visible in any urban planning, be it City level, Town level, District level or Local level. The entire road network itself acts as a transition mode. Integrated in the city scape there are interaction spaces, gathering spaces, urban corridors, plazas that standstill but act as a transition space in their own way. Urban nodes or the intersection points of streets can also be referred to as transition space, but at a macro level. These nodes however are in a complete state of flux and the level of activity is not constant. Similarly a slight hierarchy is visible in buildings as well. The next level is the semi-private to completely private area. Transition Spaces in Indian context In Indian architecture, the transition spaces play a very significant role, especially in residential buildings. The transition spaces marked the boundaries of the living space. They played a role in both dividing and connecting the inner and outer space: These spaces were richly decorated and ornamented to highlight the transition space. In Indian architecture, the typology and nature of the transitional spaces have been changing with time. They vary in scale, usage and connection. The earlier cities were dense; hence the transitional spaces were tight and mostly bound by all sides, creating a sense of space and comfortable scale. As settlements grew, they became more planned and organized; hence, the transitional spaces were organized and no more acted as left out spaces. Visual expression became a very important aspect of such spaces. With modern age came the functional use of these spaces. These enable equal distribution of physical benefits. Also, in Indian architecture, design elements contribute a lot to transition spaces. If there is no defined space then confinement by some of the above elements makes the space functional and sensible; or a transitional space. For example, the Anup Talao in Fatehpur Sikri provides a very elegant transition from the inside Khwabgah complex to the outside. The central platform in the talao serves as a nice interaction space as well as a quite space. The platform here can be reached by the four bridges only; hence the four bridges here also act as a

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transition space.

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Chapter 3 : Introduction: Regional Geography

ALL regional boundaries are transition zones. Some are large, like the boundary between Sub-Saharan Africa and North Africa. Others may be quite narrow and distinct, but they are still transition zones.

Fauna Although the earliest study of the geographic distribution of animals was that of Sclater in see above History , it was Wallace who set the parameters to determine the zoogeographic regions, or realms, in his classic book, *The Geographical Distribution of Animals* Wallace recognized three realms: His divisions, although modified, form the basis of the realms recognized today Figure 2. Although different species have different dispersal abilities, even bird and insect distributions can be accounted for by traditional zoogeographic boundaries. In general, the distribution of terrestrial mammals, freshwater fish , and invertebrates seem to correspond well and provide the best evidence of zoogeographic divisions. The zones where faunas mix have in many cases been well studied. Some classifications arbitrarily include them in one region or realm , and some omit them from any formal assignment and relegate them to a Subtraction-Transition zone. Located between the Paleotropical and Australian realms, Wallacea contains a mixture of both regions. The fauna is impoverished and unbalanced, but the area does have a high endemism. The following divisions are based on and modified to a great degree from the work of P. Holarctic realm The Holarctic Figure 2 is usually divided on the basis of terrestrial organisms into two regions: Unlike the North American phytogeographic region, the Nearctic zoogeographic region extends south to include all of Florida and Baja California. Some intriguing disjunct distributions are found in the Holarctic: These distributions are perhaps explicable on the basis of the movement, in the recent past, of climatic zones. Specialists on freshwater fish and invertebrates prefer to divide the Holarctic more finely. Petru Banareescu recognizes the following regions: Among the families characteristic of this realm are mammals such as *Talpidae* moles , *Castoridae* beavers , *Ochotonidae* pikas ; amphibians such as three families of salamanders, *Salamandridae*, *Cryptobranchidae*, and *Proteidae*; and invertebrates such as the freshwater crayfish family *Astacidae*. Paleotropical realm The Paleotropical, or Afro-Tethyan, realm Figure 2 is clearly divided into two regions, which are sometimes regarded as separate realms: Two other regions, Madagascar and Wallacea, are commonly separated from the two main ones. Being in continuous geographic contact, the Paleotropical and the Holarctic realms merge into one another. Nevertheless, each has many distinct elements, in part but not entirely because of their different climates. The mammalian orders *Pholidota* pangolins and *Proboscidea* elephants are endemic to the Paleotropical region. Mammalian families that are confined to and extend across the realm include the *Cercopithecidae* Old World monkeys , *Lorisidae* lorises, bush babies, angwantibo, and potto , *Hystricidae* Old World porcupines , *Viverridae* civets and mongooses , *Rhinocerotidae* rhinoceroses , and *Tragulidae* chevrotains. Endemic avian families include *Bucerotidae* hornbills and *Pittidae* pittas ; and endemic reptilian families, *Chamaeleontidae* Old World chameleons. Afrotropical region The line between the Afrotropical, or Ethiopian, region and the Holarctic is generally drawn somewhere across the Sahara desert Figure 2. A radical reanalysis of mammal distributions by Charles H. Smith , however, has concluded that the Mediterranean region, including both its southern and northern shores, is actually much more Paleotropical than Holarctic in aspect Figure 4; compare Figure 2. Strictly speaking, the term Afro-Tethyan in reference to the Tethys Sea; see above The effects of geologic changes on biotic distributions would apply to this expanded concept. System of faunal regions based on a reanalysis of mammalian distributions by Charles H. In striking contrast to the plant life in the southern tip of Africa, which makes up the South African, or Capensis, kingdom, the fauna of the Cape region cannot be distinguished from that of the surrounding regions. Presumably any unique faunal Capensis element that may have existed at one time has merged with the tropical element. African mainland endemic taxa include the mammalian orders *Hyracoidea* hyraxes , *Tubulidentata* armadillos , and *Macroscelidea* elephant shrews ; the mammalian families *Chrysochloridae* golden moles , *Pedetidae* springhares , *Thryonomyidae* cane rats , and *Giraffidae* giraffes and okapi ; the bird

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families Struthionidae ostriches , Balaenicipitidae shoebills , and Sagittaridae secretary birds ; the frog subfamily Phrynomerinae; the freshwater fish subclass Palaeopterygii bichirs , and families Mormyridae snoutfish and Malapteruridae electric catfish ; and the snail family Aillyidae. Madagascan region Madagascar is so different from the continent of Africa that it is generally given equal status as a separate region Figure 2. Mammalian families shared with the African mainland Paleotropical realm include Tenrecidae tenrecs and otter shrews and Hippopotamidae hippopotamuses, which have recently become extinct in Madagascar. Madagascar also shares some groups with the Neotropical realm, notably iguanas and boas, which the rest of the Paleotropical realm presumably lost during the Paleogene and Neogene periods Madagascan endemics include, among mammals, several families of lemurs. Distinctive subgroups of tenrec insectivores, carnivores, and murid rodents also are endemic, as are the avian family Aepyornithidae the recently extinct elephant birds and other subfamilies and families of birds. Familiar African mainland animals, such as monkeys, antelopes, elephants, rhinoceroses, and big cats, are absent. Seychelles and the Mascarene Islands have distant Madagascan affinities and are generally included in the Madagascan region. Oriental region Endemic families in the Oriental, or Sino-Indian, region include, among mammals, the Tupaiidae tree shrews , Tarsiidae tarsiers , and Hylobatidae gibbons ; among reptiles, the Lanthanotidae earless monitor lizards and Gavialidae the crocodile-like gharials ; and a few bird and invertebrate families. The three-way boundary between the Oriental and Afrotropical regions and the Holarctic realm is difficult to define; essentially the entire area of Southwest Asia is transitional Figure 2. Certain areas within this span, however, are more clear-cut: A distinctive desert fauna, often referred to as Saharo-Sindian, unites the entire region and has been allocated by different authorities to any one of the three regions. Mammalian specialists such as G. Corbet place the approximate boundary between the Oriental region and the Holarctic in central China; however, Banareescu extends what he calls the Sino-Indian region north to include the Tien Shan mountain system, Tibet, and the Huang Ho , based on evidence of freshwater fish and invertebrates. Much debate has centred around the dividing line between the Oriental region and the Australian Notogaeal realm. The basis for this division is the striking difference between faunas to the east and west of the line. Subsequent debate has continued for generations about the position of this boundary. The northern part of the line was altered by T. Huxley to fall to the west of the Philippines excluding Palawan. Simpson because the Philippines has a highly idiosyncratic fauna. Faunal boundaries in the Indonesian archipelago. Wallacea The famous zoogeographic transition zone called Wallacea is located in central Indonesia. No comparable floral division is apparent compare Figure 3. Celebes and the Philippines excepting Palawan, which is Oriental, contain somewhat unbalanced faunas. Most of these faunas are generically distinct from their Oriental relatives, although some, such as those of Celebes, include a few Australian elements. Flores, in the Lesser Sundas, has, or had, a very few but distinctive genera, as did Timor. In the Moluccas the faunal affinities are clearly with New Guinea. It consists of four regions: Australian, Oceanic, New Zealand , and Hawaiian. The faunas of many of the Pacific Islands , however, have as much in common with the Paleotropical fauna as with the Australian fauna proper. Endemic to the region are the monotremes egg-laying mammals such as the platypus [Ornithorhynchus anatinus] , four of the six orders of marsupials, many families of birds and fish, and some invertebrates. Gondwanan affinities include ratites flightless birds , lungfish, the reptilian families Chelydidae snake-necked turtles and the extinct Meiolaniidae horned tortoises , the frog families Hylidae tree frogs and Leptodactylidae, and several invertebrate families. Bird orders such as Rheiformes rheas and Casuariiformes cassowaries and families such as Menuridae lyrebirds and Paradisaidae birds-of-paradise are endemic to the region, which is the only part of the Notogaeal realm that contains any mammals, except bats. The inclusion of New Guinea in this region is interesting; the New Guinean fauna comprises the rainforest aspect of the Australian fauna. The disparity in the biological affinities of this large island exemplifies perhaps one of the most striking differences between phytogeography and zoogeography. As mentioned above, the flora of New Guinea is classified as Paleotropical, but the fauna is not included in the comparable faunal realm; see The distribution boundaries of flora and fauna. Oceanic region This region Figure 2 is poorly defined. It contains some localized endemics,

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notably the bird family Rhynochetidae kagu in New Caledonia. Much of the fauna, especially birds, is of demonstrable Australian affinity. New Zealand region The New Zealand region Figure 2 includes all of New Zealand, excluding aspects of the fauna of the southwest, which shows an Antarctic element. Flightless birds inhabit both New Zealand and Australia, although the order Dinornithiformes kiwis and moas is endemic to New Zealand.

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Chapter 4 : Types of Region Boundaries - MATLAB & Simulink

A physical region is an area with geographic borders, or boundaries, that are part of the natural landscape. For example, in the United States, we have a major physical region called the Great Plains.

Understand the unique geographic qualities of the Maghreb and explain how this region is connected to Europe. Outline the political issues in North Africa and understand the transitions and conflicts occurring in the governments of the region. Describe the main qualities of the African Transition Zone and explain how the dynamics of this zone are affecting the country of Sudan. Today, it is a Muslim-dominated realm with Arabic as its primary language. Historically, the ethnicity of North Africa was predominantly Berber. The main ethnic background of the African groups in the Maghreb. When Islam diffused into North Africa, the Arab influence and culture were infused with it. Modern Egypt has become the cornerstone of the Arab world; more Arabs live in Cairo than in any other city on Earth. Map courtesy of University of Texas Libraries, [http:](http://) Islam was eventually pushed out of the Iberian Peninsula and held south of the Strait of Gibraltar. Islamic architecture and influence remain part of the heritage of Iberia. The historical geography of North Africa is not complete without an understanding of the European influences that have dominated or controlled this region for centuries. The Roman Empire controlled much of the coastal area of the Mediterranean during its zenith. The Romans built ports, aqueducts, roads, and valuable infrastructure. After the fall of the Roman Empire, common bonds of religion and language were created for the people through the invasion of the Arabs, who introduced the Islamic faith. North Africa was later dominated by European colonialism. Italians colonized the region that is now Libya. The Barbary Coast of the Mediterranean was once a haven for pirates and a danger to shipping during the colonial era. Even the United States involved itself with wars against the pirates off the coast of the Berber states of North Africa during the early s. The Spanish colonized parts of Morocco and Western Sahara. In due time, resistance movements were successful in defeating the colonial powers and declaring independence for all the countries of North Africa. This is a zone subject to shifting boundaries. The region was once a major trade route between the Mali Empire of the west and the trade centers of Ethiopia in the east. Camel caravans have crossed this sector of Africa for centuries, and camel caravans from Mecca might have traveled across this zone. Many nomadic groups continue to herd their livestock across the region in search of grazing. The main Atlas range is often snow-covered at higher elevations. This is substantially more rainfall than what is received in the Sahara Desert to the south. The Atlas Mountains extract precipitation from the air in the form of rain or snow, which allows fruits and vegetables to be grown in the fertile mountain valleys of the Maghreb. To the south of this region is the vast Sahara Desert with lower precipitation and warmer temperatures. Libya is actually outside the range of the Atlas Mountains but is associated with the Maghreb by most local inhabitants. Map courtesy of Williamborg, [http:](http://) Aided by a moderate type C climate, the northern coastal region of the Maghreb and the mountain valleys are a center for agricultural production, including grapes, dates, oranges, olives, and other food products. Think about how geography affects population: Which climate type do most human groups gravitate toward? What conditions will you find when you combine this climate type and generous quantities of water and food? As you fit the pieces of the geographic puzzle together, you can understand why populations centralize in some places and not in others. The Maghreb is an attractive place for human habitation, but it borders on the inhospitable vastness of the Sahara Desert. There are few people in the vast desert interior of these countries. The exceptions are groups such as the Tuareg that are found in the Sahara. The Maghreb is an expansive region with countries of size. Algeria, Libya, and Morocco are large countries in terms of physical area. Algeria is similar in area to the entire United States east of the Mississippi River, Libya is larger than the state of Alaska, and Morocco is the size of the state of California. A large percentage of Algeria south of the Maghreb and a large percentage of the area south of the Mediterranean coastline in Libya fit the classification of desert conditions. The largest cities of Libya are along the coast, but other Libyan cities are positioned in the desert region. Tunisia, the

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smallest of the countries on the Mediterranean, is about the same size as the US state of Wisconsin and has mountains in its north and desert areas to the southwest. All the countries of the Maghreb have former connections to Europe. These ties have strengthened in recent years because of an increase in trade and the economic dependencies that have been created between Europe and the Mediterranean. North Africa can grow fruit and vegetable crops that are not as plentiful in the colder northern latitudes. In the last half of the twentieth century, an enormous amount of oil was discovered in the Maghreb, and Europe has a growing need for energy. The discovery of oil changed the trade equation: Oil and natural gas exports now make up 95 percent of the export income for Algeria and Libya. Economic Geography of the Maghreb Europe, which is in the higher stages of the index of economic development, has small families with fewer young people to fill entry-level service jobs, and North Africa has a burgeoning population of young people seeking employment. Many people from North Africa speak the languages of their former colonial masters, and when they leave North Africa seeking employment, they find the transition to a European lifestyle relatively straightforward. Migration from the shores of North Africa to Europe is not difficult; the Strait of Gibraltar, for example, is only about nine miles across from Morocco to Spain. The distance from Morocco to Spain across the strait is about nine miles, making immigration to Europe from North Africa only a matter of a short boat ride. European countries have attempted to implement measures to halt the tide of illegal immigration into their continent from North Africa but have not been successful. The need for cheap labor in European countries is a major economic factor in this equation. The core-periphery spatial relationship creates the push-pull forces of migration based on opportunities and advantages. Europe needs cheap labor and more energy, provides employment opportunities, and has an advantage in its higher standards of living: North Africa can supply labor and oil, has high levels of unemployment, and suffers from poor economic conditions: Europe is the core economic region, and North Africa is the peripheral economic region. People usually shift from periphery to core in their migration patterns, and this is the case across the Mediterranean. European and American influences have been strong in North Africa. Western culture continues to compete with fundamental Islamic tendencies in the region, especially in urban centers. In Morocco, which is the farthest country from Mecca, democratic reforms have opened the country to more opportunities for women and have led to exposure to Western fashions, ideas, and products. Tunisia has a supportive Westernized society. In Libya, birth control or family planning products have not always been supported by the government, so family size remained relatively high until about when it began to decline. Women are allowed to go to college in Libya, but a smaller percentage are enrolled compared to men. More than 90 percent of Libyans live in urban areas. Exposure to Western concepts, along with urbanizing and industrializing of the economy, has caused a drop in family size in Libya from 7. More women are trading traditional dress for Western-style clothing and are entering the workforce to the extent they are allowed. Political Geography of the Maghreb Economic and political pressures are building across North Africa. Toward the end of and the spring of , activists called for the governments in North Africa to implement change and address the push of North Africans for stronger democratic openness, less government corruption, and the sharing of wealth accumulated by those in power. Leaders have been reluctant to relinquish power and are being challenged by protests and revolution. The driving forces for the people have been high unemployment rates, high food prices, and the lack of adequate housing. In the latter half of the s, Morocco annexed and took control of this region following the withdrawal of Mauritanian control. By , the United Nations UN had stepped in, brokered a halt to the fighting, and worked to resolve the matter. Western Sahara is mainly desert terrain and only has about three hundred thousand people. The UN delegation has indicated that independence is not realistic. However, talks continue between the factions to work out a solution. In the s, the Islamic Salvation Front, which advocates for a fundamentalist Islamic state in Algeria, challenged the secular political mainstream. The electoral process was interrupted, and the government found itself fighting an Islamic insurgency within the country. By , more than one hundred thousand people had been killed. The horror of the violence received international attention. Islamic extremists widened their attacks and massacred entire villages to send a message to support their cause. By the

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end of the decade, government forces gained control of the country, and the Islamic Salvation Front officially disbanded. Smaller extremist groups continued to operate. Coinciding with similar protests across North Africa, during and , there was an insurgence of protests and demonstrations against the government of Algeria by its people, who were asking for better living conditions. The government made some concessions to address the issues, but the political climate in Algeria continues to be tense as the government struggles to find ways to satisfy the needs of the people. Tunisia Tunisia was once an outpost of the Roman Empire, and well-preserved Roman ruins can be found throughout North Africa. The political problems in Tunisia today stem from the fact that little has changed in the government since the time of independence. Since independence Tunisia has had few changes in government leaders. Ben Ali worked to stem the tide of Islamic fundamentalism, opened the country to establishing rights for women, and allowed more tolerance of religious diversity; however, under his leadership the government struggled to find a balance between democratic openness and authoritarian measures to keep the country moving forward with economic development and social services for a growing population. Photo courtesy of gr33ndata, <http://www.gr33ndata.com>: Beginning in , corruption, unemployment, and a lack of personal freedoms prompted Tunisians to take to the streets in massive protests, which grew into a revolution for change. By the end of the year, President Ben Ali was removed from power and an interim government was formed. Protests continued as the government shifted to adapt to the conditions. In , a new constitutional assembly was formed to address changes in the government. Economic conditions have remained thorny during the transition. Libya Muammar Gadhafi came to power in Libya in by overthrowing the king and never held an election for political control.

Chapter 5 : North Africa and the African Transition Zone

The femoral region lies between the gluteal, abdominal, and perineal regions proximally and the knee region distally. It contains a large percentage of the femur or thigh bone, The knee region contains components of the femur, tibia, fibula, patella and the corresponding joints.

A Will Steger Legacy, which is reframing the way that people talk about the issue of climate change, incorporating not only the science but the potential solutions. In this issue, we learn about some of the ways that climate change is expected to affect the Boundary Waters region. While there are still those who deny climate change, scientists from all types of institutions—from universities to state agencies—have been working to understand the effects of climate change in the Boundary Waters region. There are still many unknowns, but from their work, one thing is becoming clear: Changes are being seen in temperature, precipitation, and plant species, and changing climate conditions are also placing stressors on animal populations. Over the next several decades, the boreal forest so iconic to the northwoods could significantly change. The epicenter of warming In many ways, the Boundary Waters region lies at the heart of warming in Minnesota. He says that the locations typically vying to set records as the coldest are being affected the most. Winter temperatures and overnight lows are seeing the greatest amount of change. While the region has set some warm weather records during the summer, there is no trend showing an increase in the intensity of summer heat. As a public speaker, Blumenfeld has had audiences cheer at the idea of a warmer winter, but he points out that cold temperatures play an important role in the ecosystem. According to Blumenfeld, northeastern Minnesota shows small signs of intermediate-term drying while the rest of the state grows wetter. That could be important given the final trend that Blumenfeld noted: While things might tend to be drier, large rainfall events, like the one experienced in Duluth a few years ago, are getting slightly larger and happening more frequently. Changing landscapes Change is already being documented in the Boundary Waters Region. He and several PhD students have been studying the Boundary Waters Canoe Area Wilderness region for about a decade, and Frelich is also developing a model that will project biomes in each part of the region, down to an extremely small scale. Graduate student Dave Chaffin surveyed over 2, plots throughout the Boundary Waters and nearly all of them had red maple seedlings. Another graduate student, Nick Fisichelli, studied summer temperature conditions for boreal and temperate forest and found that, at cooler temperatures, spruce and fir seedlings grow faster than maple and oak. At warmer temperatures, maple and oak seedlings grow faster. As temperatures continue to climb, conditions will favor those temperate trees. Frelich expects that temperate forest to last in eastern parts of the Boundary Waters with possible pockets of boreal forest. But based on the work of a third student, Nick Danz, who studied the boundary between forest and prairie, Frelich projects that the central and western parts of the wilderness area will eventually transition to oak savannah. That variation primarily stems from temperature differences across the region. Graduate student Chaffin also distributed temperature sensors across the Boundary Waters and measured the temperature every two hours for two years. The eastern part of the wilderness is about 10 degrees cooler in summer than the area surrounding Ely, Minn. In the northeastern parts of the Boundary Waters, Frelich also expects to see variation between north and south facing slopes, where more solar radiation creates higher temperatures and causes more water to evaporate than on northern slopes. Frelich expects to see a similar transformation in Quetico Provincial Park. Impacts on animal and fish populations Frelich is succinct when it comes to understanding what the change in forest will mean for animal populations. He has studied both moose and Canada Lynx, among other mammals, and explained that northeastern Minnesota and Ontario are on the southern edge of the boreal forest. That can make animal populations more susceptible to change, and changes have occurred in moose and Canada Lynx that can be related to climate change. He emphasized, however, that there are many factors at play. Most recently, for example, moose have garnered attention because of their declining numbers in the region. According to Moen, warming temperatures have placed stressors on the species, but parasites, habitat

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changes and predation all play a role as well—and the decline is still being studied. However, for adult moose in particular, parasites and diseases related to warming temperatures have contributed to the decline. And a study conducted in conjunction with the Minnesota Zoo showed the respiration rate of moose increases at about 68 degrees Fahrenheit for the same reason that a dog or sheep might pant: That can have significant implications, causing animals to forage at night rather than during the day, which is a less efficient way of eating. He confirmed that some cold water fish have been on the decline since the early s, most notably Cisco, a cold water fish found in lakes across the state. Yet the further north you go, he noted, and the deeper and clearer the lake, the better things are. Making sense of the changes Uncovering the changes that are resulting from climate change is one thing. Figuring out what to do with the information is another. But there is an emotional component, too. These impacts change the nature of a landscape beloved for being a boreal forest, with moose, lynx, and other northwoods animals. When you read about the changes, how does that make you feel? Email us at editor.wildernessnews. Read the full article online [here](#).

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Chapter 6 : Heliosphere - Wikipedia

A boundary is a real or imaginary line that separates two things. In geography, boundaries separate different regions of the world. The boundaries of the world are many different types of boundaries.

Chapter 8 North Africa and Southwest Asia Identifying the Boundaries The realm of North Africa and Southwest Asia is large and expansive in terms of physical area, but its regions share a number of common qualities. The physical area of this realm is divided into three regions: North Africa, Southwest Asia, and the countries of Turkestan. Alternative term for the region of Central Asia named after the Turkish people who moved through the area centuries ago. Egypt has territory in both Africa and Asia through its possession of the Sinai Peninsula. The land on the eastern shores of the Mediterranean Sea is frequently referred to as the Levant. Land area bordering the eastern Mediterranean Sea that now includes Israel, Lebanon, and parts of western Syria. Afghanistan is the only country of Central Asia that was not officially a part of the former Soviet Union. Turkey, with its focal point of Istanbul, has been considered part of the Near East by Europeans. The word orient refers to the east; occident refers to the west. This term is not entirely accurate but is widely used to refer to Southwest Asia. Three small countries in the Caucasus Mountains—Georgia, Azerbaijan, and Armenia—are affiliated with this realm through their geographic location and their histories. They are technically European countries and were once part of the former Soviet Union. The details of these countries are covered in Chapter 1 "Introduction to the World". Turkey, which has territory in both Europe and Asia, was historically referred to as Asia Minor. The ancient region that is present-day Turkey. The portion of Turkey that lies to the west of Istanbul is on the European continent, which connects Turkey with the European community. Cyprus is a small island in the eastern Mediterranean that has ties to Turkey and a historical connection to the Middle East. Cyprus is technically a European country and is a member of the European Union. Bordering both Iran and China is Afghanistan, which has been a transitional country in the pages of history. Many empires have conquered it, and many groups have fought over its territory. Today, Afghanistan is a key country in the globalization process because of its huge mineral reserves, yet it has a volatile and unstable political scene. Sudan could also be studied with East Africa. The African Transition Zone cuts across Sudan and extends through the widest part of the African continent. The African Transition Zone creates a boundary for the realms of North Africa and Southwest Asia dividing the Islamic influence to the north from the Christian influence to the south. It is also a transitional boundary between the dry and arid type B climates and the more tropical type A climates of Equatorial Africa. The countries on the eastern end of the African Transition Zone—including Eritrea, Somalia, and Ethiopia—are often covered with this realm in other contexts, but in this textbook, the critical information was included in the section on East Africa Chapter 7 "Subsaharan Africa", Section 7. The African Transition Zone can be volatile, with the potential for ethnic, cultural, or political conflicts. Map courtesy of University of Texas Libraries, <http://www.lib.utexas.edu/maps/africa/>: Outline the two cultural hearths and explain why they developed where they did. Describe how the people of this realm gain access to fresh water. Understand how the events of the Arab Spring have affected the realm. The countries of the realm share three key dominant traits that influence all other human activities. The first key common trait relates to the climate of the region. Though various climate types can be found in this realm, it is the dry or arid type B climate that dominates and covers most of the physical area. Other climate types include the type H highland climate cold temperatures at the high elevations with moderate temperatures at the bases of the mountains of the Maghreb, Iran, or Central Asia and the more moderate type C climate in the coastal regions bordering the sea. The type C climate along the coastal Mediterranean area attracts human development and is home to many large port cities. The overall fact is that vast areas of each region are uninhabited desert. Kazakhstan, Uzbekistan, and Turkmenistan have vast regions of desert with few if any inhabitants. This aspect of the realm reveals the importance of water as a valuable natural resource. Most people in the realm are more dependent on the availability of water than on the availability of oil. The second trait is Islam: The practice of Islam in

day-to-day life takes different forms in the various divisions of the religion. The differences between the divisions have contributed to conflict or open warfare. Islam acts as more than just a religion. It also serves as a strong cultural force that has historically unified or divided people. The divisive nature of the religion has often resulted in serious political confrontations within the realm between groups of different Islamic ideologies. Concurrently, the religion of Islam is also a unifying force that brings Muslims with similar beliefs together with common bonds. Islam provides structure and consistency in daily life. The faith can provide comfort and a way of living. The holy cities of Mecca and Medina are located in Saudi Arabia. Other holy cities for other divisions of Islam include Jerusalem and the two cities holy to Shia Muslims: Karbala and Najaf in Iraq. Islam dominates the realm, but other religions are significant in various regions. Israel is a Jewish state, and Christianity is common in places from Lebanon to Egypt. The third factor that all three regions of the realm share is the availability of significant natural resources. North Africa, Southwest Asia, and Turkestan all have significant reserves of oil, natural gas, and important minerals. It stands to reason that not every country has the same reserves and that some of the countries have very few or none at all. However, in terms of how the countries gain national wealth, it is the export of oil that has dominated the economic activity as it relates to the global community. This realm is a peripheral realm. The resource that the realm can offer to the core economic regions of the world is the energy to fuel their economies and maintain their high standard of living. Enormous economic profits from the sale of these resources have traditionally been held in the hands of the elite ruling leader or his clan and do not always filter down to most of the population. The control of and profits from natural resources have become the primary objectives of the countries; this fuels conflicts and armed military interventions in areas such as Iraq and Afghanistan. Cultural Hearths Availability and control of fresh water have typically resulted in the ability of humans to grow food crops and expand their cultural activities. Hunter-gatherer groups did not settle down in one area but were more nomadic because of their seasonal search for food. As humans developed the ability to grow crops and provide enough food in one place, they no longer needed to move. The earliest human settlements sprang up in what is the present-day Middle East. Early human settlements provide some indication of early urbanization patterns based on the availability or surplus of food. The shift to permanent settlements included the domestication of livestock and the production of grain crops. Fruits and vegetables were grown and harvested domestically. It is theorized that the ability to grow excess food provided the time and resources for urbanization and the establishment of organized communities, which often progressed into political entities or regional empires. It has been estimated that some of the earliest cities in the world—Jericho, for example—were first inhabited around 10,000 BCE in the Middle East. In the same region, two cultural hearths Region or area where an early human civilization began. Both areas were settings for the growth of human civilization and are still being examined and studied today. In Mesopotamia, a remarkable human civilization emerged along the banks of the Tigris and Euphrates Rivers in what is present-day Iraq, Syria, and southern Turkey. The climate, soils, and availability of fresh water provided the ingredients for the growth of a human civilization that is held in high esteem because of its significant contributions to our human history. Photo courtesy of Marie-Lan Nguyen, <http://www.marie-lan.com>. Neolithic pottery found there has been dated to before 5000 BCE. Humans in this area urbanized as early as 5000 BCE. People were settling in the Mesopotamia region, building magnificent cities, and developing their sense of human culture. Mesopotamia gave rise to a historical cradle of civilization The location where early human settlements developed into long-term cultures with prominent advancements. Famous cities such as Ur, Babylon, and Nineveh were located in the Mesopotamia region. The control of water and the ability to grow excess food contributed to their success. They developed extensive irrigation systems. Large grain storage units were necessary to provide the civic structure and to develop a military to protect and serve the city or empire. The human activity in this area extended around the region all the way to the Mediterranean Sea, which is where the term Fertile Crescent The region of Mesopotamia and the Levant where early human civilization flourished. The cities of Tyre and Sidon were ports and access points for trade and commerce for groups like the Phoenicians who traded throughout the Mediterranean. Ancient cities such as Damascus and

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Jericho became established in the same region and were good examples of early human urbanization during the Bronze Age. These cities are two of the oldest continually inhabited cities in the world. The pyramids and the Sphinx in the Giza Plateau just outside Cairo stand testimony to the human endeavors that took place here. Spring flooding of the Nile River brought nutrients and water to the land along the Nile Valley. The land could produce excess food, which subsequently led to the ability to support a structured, urbanized civilization. The Nile River is the lifeblood of the region. Geologists, using the erosion patterns of the Sphinx, estimate that it was constructed about 10, BCE. The ability of humans to harness the potential of the environment set the stage for technological advancements that continue to this day. The Egyptian civilization flourished for thousands of years and spawned a legacy that influenced their neighbors in the region, who benefited from their advancements. Many of our legends, stories, and myths have their origins in these cultures. The engineering feats needed to create the magnificent temples and pyramids have by themselves been studied and analyzed over the centuries to give modern scientists and scholars a reason to pause and recognize the high level of organization and structure that must have gone into developing and managing these civilizations. Various aspects of science and the arts were being developed by these ancient people. Writing, mathematics, engineering, and astronomy were becoming highly advanced. Artifacts such as clay tablets and hieroglyphs are still being discovered and interpreted and shed additional light on the advancements of these civilizations and their contribution to our collective human civilization. Access to Fresh Water Water is one of the necessities for human existence, and human settlements have long been based on the availability of water for human consumption and agriculture, navigation, and the production of energy.

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Chapter 7 : North Africa and Southwest Asia

Biogeographic region - Fauna: Although the earliest study of the geographic distribution of animals was that of Sclater in (see above History), it was Wallace who set the parameters to determine the zoogeographic regions, or realms, in his classic book, The Geographical Distribution of Animals ().

Features[edit] There are several distinguishing features of an ecotone. First, an ecotone can have a sharp vegetation transition, with a distinct line between two communities. Second, a change in physiognomy physical appearance of a plant species can be a key indicator. Third, a change of species can signal an ecotone. There will be specific organisms on one side of an ecotone or the other. Other factors can illustrate or obscure an ecotone, for example, migration and the establishment of new plants. These are known as spatial mass effects, which are noticeable because some organisms will not be able to form self-sustaining populations if they cross the ecotone. If different species can survive in both communities of the two biomes, then the ecotone is considered to have species richness ; ecologists measure this when studying the food chain and success of organisms. Lastly, the abundance of exotic species in an ecotone can reveal the type of biome or efficiency of the two communities sharing space. Therefore, an ecotone can create a diverse ecosystem.

Formation[edit] Changes in the physical environment may produce a sharp boundary , as in the example of the interface between areas of forest and cleared land. Elsewhere, a more gradually blended interface area will be found, where species from each community will be found together as well as unique local species. Mountain ranges often create such ecotones, due to the wide variety of climatic conditions experienced on their slopes. They may also provide a boundary between species due to the obstructive nature of their terrain. Mont Ventoux in France is a good example, marking the boundary between the flora and fauna of northern and southern France. The spatial variation of ecotones often form due to disturbances, creating patches that separate patches of vegetation. Different intensity of disturbances can cause landslides, land shifts, or movement of sediment that can create these vegetation patches and ecotones. Beyond this competitors of the adjacent community take over. As a result, the ecotone represents a shift in dominance. Ecotones are particularly significant for mobile animals, as they can exploit more than one set of habitats within a short distance. The ecotone contains not only species common to the communities on both sides; it may also include a number of highly adaptable species that tend to colonize such transitional areas. Ecotones and ecoclines[edit] An ecotone is often associated with an ecocline: The ecotone and ecocline concepts are sometimes confused: An ecotone is often unobtrusive and harder to measure. Ecotones can be easily identified by distinct change in soil gradient and soil composition between two communities. Biologists believe it was the depth of the Lombok Strait itself that kept the animals on either side isolated from one another. However, it has been found that some flightless animals such as certain weevil species have, in the past, been involved in several transgression events in which species from land east of the Wallace Line relocated to Bali. They shared the Asian fauna. These islands were, instead, colonized by Australasian fauna.

Chapter 8 : Ecosystem Boundaries

An ecotone is a transition area between two biomes. It is where two communities meet and integrate. [2] It may be narrow or wide, and it may be local (the zone between a field and forest) or regional (the transition between forest and grassland ecosystems). [3].

Energetic neutral atoms map by IBEX. A type of particle called an ENA has also been observed to have been produced from its edges. Near the Sun, there is a host of spacecraft that observe the Sun and interplanetary space, and one of the latest to explore nearer to the Sun than ever before is the Parker Solar Probe launched in Solar observations, such by Solar eclipses that allow observation of the Corona and various types of space observatories also provide data on the Sun and its influences. The study of other Stars can also allow insights indirectly. Except for regions near obstacles such as planets or comets , the heliosphere is dominated by material emanating from the Sun, although cosmic rays , fast-moving neutral atoms , and cosmic dust can penetrate the heliosphere from the outside. The point where the solar wind becomes slower than the speed of sound is called the termination shock ; the solar wind continues to slow as it passes through the heliosheath leading to a boundary called the heliopause , where the interstellar medium and solar wind pressures balance. The termination shock was traversed by Voyager 1 in , [6] and Voyager 2 in Heliospheric current sheet The heliospheric current sheet is a ripple in the heliosphere created by the rotating magnetic field of the Sun. At some distance from the Sun, well beyond the orbit of Neptune , this supersonic wind must slow down to meet the gases in the interstellar medium. This takes place in several stages: The solar wind is traveling at supersonic speeds within the Solar System. At the termination shock, a standing shock wave , the solar wind falls below the speed of sound and becomes subsonic. It was previously thought that, once subsonic, the solar wind would be shaped by the ambient flow of the interstellar medium, forming blunt nose on one side and comet-like heliotail behind, a region called the heliosheath. However, observations in showed that this model is incorrect. This is the edge of the entire heliosphere. Observations in led to changes to this model. Outside the heliopause, would be a turbulent region caused by the pressure of the advancing heliopause against the interstellar medium. However, the velocity of Solar wind relative to the interstellar medium is probably too low for a bow shock. This causes compression , heating, and a change in the magnetic field. In the Solar System the termination shock is believed to be 75 to 90 astronomical units [31] from the Sun. The exact speed depends on the density, which fluctuates considerably. The interstellar medium, although very low in density, nonetheless has a constant pressure associated with it; the pressure from the solar wind decreases with the square of the distance from the Sun. As one moves far enough away from the Sun, the pressure of the solar wind drops to where it can no longer maintain supersonic flow against the pressure of the interstellar medium, at which point the solar wind slows to below its speed of sound, causing a shock wave. Further from the Sun, the termination shock is followed by the heliopause, where the two pressures become equal and solar wind particles are stopped by the interstellar medium. Other termination shocks can be seen in terrestrial systems; perhaps the easiest may be seen by simply running a water tap into a sink creating a hydraulic jump. Upon hitting the floor of the sink, the flowing water spreads out at a speed that is higher than the local wave speed , forming a disk of shallow, rapidly diverging flow analogous to the tenuous, supersonic solar wind. Around the periphery of the disk, a shock front or wall of water forms; outside the shock front, the water moves slower than the local wave speed analogous to the subsonic interstellar medium. Evidence presented at a meeting of the American Geophysical Union in May by Ed Stone suggests that the Voyager 1 spacecraft passed the termination shock in December , when it was about 94 AU from the Sun, by virtue of the change in magnetic readings taken from the craft. In contrast, Voyager 2 began detecting returning particles when it was only 76 AU from the Sun, in May Here the wind is slowed, compressed and made turbulent by its interaction with the interstellar medium. Its distance from the Sun is approximately 80 to astronomical units AU at its closest point. At its windward side, its thickness is estimated to be between 10 and AU. This is the boundary where

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the interstellar medium and solar wind pressures balance. The crossing of the heliopause should be signaled by a sharp drop in the temperature of charged particles, [42] a change in the direction of the magnetic field, and an increase in the number of galactic cosmic rays. The shape of the tail can be linked to the sun sending out fast solar winds near its poles and slow solar wind near its equator more recently. The clover-shaped tail moves further away from the sun, which makes the charged particles begin to morph into a new orientation. Additional Heliosphere structures[edit] The bubble-like heliosphere moving through the interstellar medium Solar map with the location of the hypothetical hydrogen wall and bow shock ENA detection is more concentrated one direction. Outside the heliosphere there is a forty-fold increase in plasma density. For other topics, see Hydrogen disambiguation. According to one hypothesis, [57] there exists a region of hot hydrogen known as the hydrogen wall between the bow shock and the heliopause. The wall is composed of interstellar material interacting with the edge of the heliosphere. One paper released in studied the concept of a bow wave and hydrogen wall. It may also vary depending on the current velocity of the solar wind and the local density of the interstellar medium. It is known to lie far outside the orbit of Neptune. Initial results October from IBEX suggest that previous assumptions are insufficiently cognisant of the true complexities of the heliopause. Bow shocks in astrophysics It was long hypothesized that the Sun produces a "shock wave" in its travels within the interstellar medium. It would occur if the interstellar medium is moving supersonically "toward" the Sun, since its solar wind moves "away" from the Sun supersonically. When the interstellar wind hits the heliosphere it slows and creates a region of turbulence. The red giant star Mira in the constellation Cetus has been shown to have both a debris tail of ejecta from the star and a distinct shock in the direction of its movement through space at over kilometers per second. Contact to Pioneer 10 and 11 has been lost. Rather than being dominated by the collisions between the solar wind and the interstellar medium, the INCA ENA maps suggest that the interaction is controlled more by particle pressure and magnetic field energy density. What we are seeing in these maps does not match with any of the previous theoretical models of this region. It will be exciting for scientists to review these ENA maps and revise the way we understand our heliosphere and how it interacts with the galaxy. Some examples of missions that have or continue to collect data related to the heliosphere include see also List of heliophysics missions:

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The heliopause is the final known boundary between the heliosphere and the there is a transitional region, as of certain types of particles from the Sun, and.

References Abstract Ecosystem boundaries are zones of transitions between two adjacent habitats. They occur naturally in all biomes but the extent of boundaries has been greatly increased by anthropogenic habitat modification. Transition zones are characterized by a profound change in the composition of plant and animal communities and that transition may be abrupt, gradual or even occur via a series of intermediate habitat types. Naturally occurring ecosystem boundaries sometimes form a unique habitat to which species are specifically adapted, whereas anthropogenically created ecosystem boundaries typically contain a mixture of species from the two adjacent ecosystems and often exert a negative influence on natural habitats. Adjacent ecosystems are connected via flows of energy, material and organisms across ecosystem boundaries, and these flows can exert strong influences on the fertility and productivity of ecosystems. Naturally occurring ecosystem boundaries can represent unique habitats to which many species are specifically adapted. Anthropogenically created ecosystem boundaries often support high species diversity, but the combination of species present at edges is very different to the one found deep inside the adjacent ecosystems. Neighbouring ecosystems experience flows of organisms, materials and energy across the shared boundary. Examples of four ecosystem boundaries. Example of stunted forest vegetation at the boundary between a terrestrial and marine ecosystem. The architecture of the trees has been greatly altered by the environmental conditions at the ecosystem boundary, resulting in the stunted, windswept form that is commonly observed in coastal forests. Journal of the Royal Society of New Zealand Canadian Journal of Forest Research Journal of Tropical Ecology Journal of Ecology Didham RK and Lawton JH Edge structure determines the magnitude of changes in microclimate and vegetation structure in tropical forest fragments. Nutrient enrichment of remnant woodlands in an agricultural landscape. Journal of Applied Ecology Fujita M and Koike F Birds transport nutrients to fragmented forests in an urban landscape. Goulding M Amazon: Kapos V Effects of isolation on the water status of forest patches in the Brazilian Amazon. Journal of Tropical Ecology 5: Journal of Biogeography Laurance WF Theory meets reality: Proceedings of the Royal Society of London. Leopold A Game Management. Journal of Animal Ecology Murcia C Edge effects in fragmented forestsâ€”Implications for conservation. Annual Review of Ecology and Systematics Annual Review of Ecology, Evolution and Systematics Journal of Vegetation Science Ecology, Management, and Conservation of Fragmented Communities. The University of Chicago Press. Trends in Ecology and Evolution An Ecological and Conservation Synthesis.