section 5-1 how populations grow

section 5-1 how populations grow explores the fundamental principles and dynamics behind population growth in ecological and biological contexts. Understanding how populations increase over time is crucial for fields such as ecology, conservation biology, and resource management. This article delves into the factors influencing population growth, including birth rates, death rates, immigration, and emigration. It also examines different models that describe population growth patterns, such as exponential and logistic growth. Additionally, the role of environmental limits and carrying capacity in regulating population size is discussed. By analyzing these components, the article provides a comprehensive overview of how populations expand and the mechanisms that control their size. The following sections will outline these concepts in detail to offer a thorough understanding of section 5-1 how populations grow.

Factors Influencing Population Growth

Population growth is determined by several key factors that either increase or decrease the number of individuals within a population. These include birth rates, death rates, immigration, and emigration. The balance between these factors dictates whether a population will grow, shrink, or remain stable over time. Understanding these elements is essential for analyzing how populations change in natural environments.

Birth and Death Rates

Birth rates refer to the number of births per unit of population over a specific period, while death rates indicate the number of deaths within the same parameters. High birth rates contribute to population growth, whereas high death rates reduce population size. The difference between these two rates is called the natural increase or decrease in population.

Immigration and Emigration

Immigration is the movement of individuals into a population from other areas, and emigration is the movement out of a population. These migration patterns significantly affect population size and genetic diversity. Populations experiencing high immigration may grow faster, while those with substantial emigration may experience declines despite birth-death dynamics.

Other Influencing Factors

Additional factors such as availability of resources, predation, disease, and environmental conditions also impact population growth. These factors can either promote or inhibit reproduction and survival, thereby influencing overall population dynamics.

Population Growth Models

Scientists use mathematical models to describe and predict how populations change over time. The two primary models are exponential growth and logistic growth, each illustrating different scenarios based on environmental constraints and population characteristics.

Exponential Growth Model

Exponential growth occurs when resources are unlimited, allowing the population to increase rapidly at a constant rate. This model assumes that birth rates consistently exceed death rates and that there are no significant environmental restrictions. Exponential growth results in a J-shaped curve when population size is graphed over time.

Logistic Growth Model

The logistic growth model accounts for environmental resistance and resource limitations. As the population size approaches the environment's carrying capacity, growth slows and eventually stabilizes. This model produces an S-shaped curve, reflecting initial rapid growth followed by a plateau as population size reaches equilibrium.

Stages of Logistic Growth

- **Lag Phase:** Slow initial growth as the population adjusts to the environment.

- **Exponential Phase:** Rapid population increase due to abundant resources.
- **Deceleration Phase:** Growth rate slows as resources become limited.
- **Stable Equilibrium Phase:** Population size stabilizes near carrying capacity.

Carrying Capacity and Environmental Resistance

Carrying capacity is the maximum number of individuals an environment can sustainably support without degrading the habitat. It is a critical concept in understanding population regulation, as populations cannot grow indefinitely in a finite environment. Environmental resistance encompasses all factors that limit population growth and maintain it at or below carrying capacity.

Defining Carrying Capacity

Carrying capacity varies by ecosystem and depends on resource availability such as food, water, shelter, and space. When populations exceed this limit, resources become scarce, leading to increased competition and stress on the population, which often results in population decline or stabilization.

Factors Contributing to Environmental Resistance

Environmental resistance includes biotic factors like predation, disease, and competition, as well as abiotic factors such as climate, natural disasters, and habitat destruction. These elements act together to slow population growth and prevent overshoot beyond carrying capacity.

Population Regulation Mechanisms

- Resource limitation
- Increased mortality rates
- Reduced birth rates
- Migration patterns
- Disease outbreaks

Human Population Growth

Human populations exhibit unique growth patterns influenced by technological advancements, healthcare improvements, and social factors. Understanding these growth dynamics is essential for addressing challenges related to urbanization, resource management, and environmental sustainability.

Historical Trends in Human Population Growth

Historically, human populations grew slowly due to high mortality rates and limited resources. However, the Industrial Revolution and advances in medicine and agriculture triggered rapid population increases, resulting in an exponential growth phase that continues in many regions today.

Current Growth Patterns and Projections

While some countries experience stabilized or declining populations due to low birth rates, others continue to grow rapidly. Projections suggest that global population growth will slow in the coming decades as fertility rates decline, but regional differences will persist.

Implications of Human Population Growth

- Increased demand for natural resources
- Environmental degradation and habitat loss
- Challenges in food security and water supply
- Urban overcrowding and infrastructure stress
- Policy and planning for sustainable development

Frequently Asked Questions

What is the main concept explained in Section 5-1 about population growth?

Section 5-1 explains how populations grow, focusing on factors that influence population size such as birth rates, death rates, immigration, and emigration.

What is exponential growth in populations?

Exponential growth occurs when the individuals in a population reproduce at a constant rate, causing the population size to increase rapidly over time.

How do birth rates and death rates affect population growth?

Population growth increases when birth rates exceed death rates, leading to a larger number of individuals over time, whereas higher death rates than birth rates cause a population decline.

What role does immigration and emigration play in population growth?

Immigration adds individuals to a population, increasing its size, while emigration removes individuals, decreasing the population size.

What is the difference between exponential growth and logistic growth?

Exponential growth describes unrestricted population increase, while logistic growth occurs when population growth slows and stabilizes due to limited resources and carrying capacity.

What factors can limit population growth according to Section 5-1?

Factors such as limited resources, predation, disease, and competition can limit population growth by increasing death rates or decreasing birth rates.

How is carrying capacity related to population growth?

Carrying capacity is the maximum number of individuals an environment can support sustainably, and it influences population growth by causing it to slow or stop as the population nears this limit.

Why is understanding population growth important for ecology and conservation?

Understanding population growth helps ecologists predict changes in species populations, manage wildlife resources, and develop conservation strategies to protect endangered species and maintain ecosystem balance.

Additional Resources

1. *Population Ecology: How Populations Grow and Interact*
This book explores the fundamental principles of population growth and regulation. It covers key concepts such as exponential and logistic growth models, carrying capacity, and factors influencing population dynamics. Readers will gain insight into how populations change over time and the ecological interactions that affect their growth.

2. *Demography and Population Growth: Patterns and Processes*
Focusing on human populations, this book examines demographic factors such as birth rates, death rates, immigration, and emigration. It explains how these elements contribute to population growth and decline, and discusses the implications for society and the environment. The text also addresses population policies and their effects on demographic trends.

3. *Principles of Population Growth in Ecology*
This title provides a comprehensive overview of population growth theories in ecological contexts. It discusses mathematical models used to describe population changes and the biological factors that influence growth rates. The book is ideal for students and researchers interested in understanding population dynamics in natural systems.

4. *The Dynamics of Animal Populations*
This book delves into the mechanisms of population growth and regulation in animal species. It covers reproductive strategies, survival rates, and environmental pressures that shape population size. Through case studies, the book illustrates how populations respond to changes in habitat and resource availability.

5. *Human Population Growth: Causes and Consequences*
Examining the rapid growth of the human population, this book analyzes the social, economic, and environmental impacts of increasing numbers. It reviews historical growth patterns and current demographic trends, highlighting challenges such as resource depletion and urbanization. The book also discusses sustainable development strategies to manage population growth.

6. *Ecological Perspectives on Population Growth*
This book integrates ecological theory with practical examples of population growth in various ecosystems. It emphasizes the role of biotic and abiotic factors in regulating populations, including predation, competition, and habitat conditions. Readers will learn about population cycles and the balance between growth and environmental resistance.

7. *Population Growth and Environmental Change*
Focusing on the relationship between population growth and environmental impacts, this book explores how increasing populations affect natural resources and ecosystems. It discusses issues such as pollution, habitat loss, and climate change in the context of growing human and animal populations. The book advocates for policies that balance growth with environmental sustainability.

8. *Mathematical Models of Population Growth*
This title presents a detailed examination of the mathematical frameworks used to understand and predict population growth. It covers models including exponential, logistic, and age-structured population models. The book is suitable for readers with an interest in quantitative biology and ecological modeling.

9. *Growth Patterns in Plant Populations*
Focusing on plant ecology, this book explores how plant populations grow and spread in different environments. It discusses factors such as seed dispersal, competition, and environmental constraints that influence plant population dynamics. The text provides valuable insights into the role of plants in ecosystem stability and succession.

Section 5 1 How Populations Grow

Section 5-1: How Populations Grow

Unravel the Mysteries of Population Dynamics and Predict the Future. Are you struggling to understand the complex forces driving population growth? Do you find yourself overwhelmed by exponential growth models and demographic transitions? Feeling lost in the jargon of birth rates, death rates, and migration patterns? This ebook provides the clarity and understanding you need to master the intricacies of population growth.

By Dr. Evelyn Reed, PhD in Demography

Introduction: Defining Population Growth and its Significance
Chapter 1: Basic Concepts of Population Growth: Understanding birth rates, death rates, and natural increase; exploring the role of migration.
Chapter 2: Exponential Growth Models: Delving into the mathematics of population growth; exploring limitations and real-world applications.
Chapter 3: Logistic Growth Models: Introducing carrying capacity and environmental limitations; analyzing the transition from exponential to logistic growth.
Chapter 4: Demographic Transition Model: Understanding the stages of demographic transition; analyzing the impact of economic development and social change.
Chapter 5: Factors Affecting Population Growth: Examining the influence of healthcare, education, and government policies; exploring the impacts of famine, disease, and war.
Chapter 6: Global Population Trends and Projections: Analyzing current population trends; exploring future population scenarios and their implications.
Conclusion: Synthesizing key concepts and highlighting the importance of understanding population

dynamics for sustainable development.

Section 5-1: How Populations Grow

Introduction: Understanding the Dynamics of Population Change

Population growth, the increase in the number of individuals within a population over a specific time period, is a fundamental process shaping our world. It's not merely a matter of counting heads; it's a complex interplay of biological, social, economic, and environmental factors. Understanding how populations grow is crucial for addressing a wide range of global challenges, from resource management and environmental sustainability to public health and economic development. This section delves into the key concepts and models that help us understand and predict population growth. We'll explore the basic components – birth rates, death rates, and migration – and then move on to more complex models that incorporate factors like carrying capacity and demographic transitions.

Chapter 1: Basic Concepts of Population Growth

The simplest way to understand population growth is to consider its fundamental components:

Birth Rate (Natality): The number of live births per 1,000 individuals in a population per year. High birth rates contribute significantly to population growth. Factors influencing birth rates include access to family planning, cultural norms regarding family size, and socioeconomic conditions.

Death Rate (Mortality): The number of deaths per 1,000 individuals in a population per year. Low death rates, alongside high birth rates, lead to rapid population growth. Factors influencing death rates include access to healthcare, nutrition, sanitation, and the prevalence of infectious diseases.

Natural Increase: The difference between the birth rate and the death rate. A positive natural increase indicates population growth, while a negative natural increase signifies population decline.

Migration: The movement of individuals into (immigration) or out of (emigration) a population. Migration can significantly impact population growth, even surpassing the effects of natural increase in some regions. Push and pull factors influence migration patterns. Push factors are negative aspects of the origin location driving people away (e.g., war, poverty, lack of opportunities), while pull factors are positive aspects of the destination location attracting people (e.g., job opportunities, better living conditions, political stability).

Chapter 2: Exponential Growth Models

Exponential growth models are mathematical representations of population growth where the rate of increase is proportional to the current population size. This means that the larger the population, the faster it grows. The formula is often expressed as:

$dN/dt = rN$

Where:

dN/dt represents the change in population size over time
r represents the intrinsic rate of increase (birth rate minus death rate)
N represents the current population size

Exponential growth produces a J-shaped curve when plotted graphically. While this model is useful for illustrating the potential for rapid population growth under ideal conditions (unlimited resources, no competition), it rarely reflects real-world scenarios for extended periods. Eventually, limitations in resources or environmental carrying capacity will constrain growth.

Chapter 3: Logistic Growth Models

Logistic growth models are more realistic representations of population growth than exponential models. They incorporate the concept of carrying capacity (K), which represents the maximum population size that a given environment can sustainably support. The logistic growth equation is more complex:

$dN/dt = rN(K-N)/K$

As the population approaches the carrying capacity (N approaches K), the growth rate slows, eventually leveling off at K. The resulting curve is an S-shape, reflecting the initial exponential growth followed by a gradual deceleration as the population reaches its environmental limits. Factors influencing carrying capacity include food availability, water resources, habitat space, and waste disposal capacity.

Chapter 4: The Demographic Transition Model

The demographic transition model describes the shift in birth and death rates that occurs as a society develops from a pre-industrial to an industrial economy. It typically involves several stages:

Stage 1 (High Stationary): Both birth and death rates are high, resulting in slow or no population growth.

Stage 2 (Early Expanding): Death rates decline due to improvements in healthcare, sanitation, and food supply, while birth rates remain high, leading to rapid population growth.

Stage 3 (Late Expanding): Birth rates begin to decline due to factors such as increased access to education, family planning, and urbanization, resulting in a slower rate of population growth.

Stage 4 (Low Stationary): Both birth and death rates are low, resulting in a stable or slowly growing population.

Stage 5 (Declining): Death rates may exceed birth rates, leading to population decline. This is a relatively new stage observed in some highly developed countries.

The demographic transition model provides a useful framework for understanding the historical and projected changes in population growth patterns across different countries. However, it's important to remember that the transition isn't always smooth or predictable, and various factors can influence the speed and trajectory of the process.

Chapter 5: Factors Affecting Population Growth

Numerous factors influence population growth, including:

Healthcare: Improved access to healthcare reduces death rates, especially among infants and children. Access to reproductive healthcare influences birth rates.

Education: Increased levels of education, particularly for women, are often associated with lower birth rates due to increased awareness of family planning and improved career opportunities.

Government Policies: Governments can significantly influence population growth through policies such as family planning programs, incentives for larger or smaller families, and immigration regulations.

Economic Conditions: Poverty and lack of economic opportunities can influence both birth and death rates.

Environmental Factors: Natural disasters, famine, and disease outbreaks can dramatically impact population size.

Chapter 6: Global Population Trends and Projections

Global population growth continues, although the rate of increase is slowing. However, the sheer magnitude of the global population presents significant challenges, including resource depletion, environmental degradation, and strain on infrastructure. Different models project various future population scenarios, which depend on factors such as fertility rates, mortality rates, and migration patterns. Understanding these projections is crucial for planning and allocating resources to meet the needs of a growing population while minimizing environmental impact.

Conclusion: The Importance of Understanding Population Dynamics

Understanding how populations grow is not just an academic exercise; it's essential for informed decision-making at all levels. From local community planning to international development strategies, grasping the intricacies of population dynamics is crucial for creating sustainable and equitable societies. By applying the concepts and models discussed in this section, we can better predict future trends, mitigate potential challenges, and work towards a more sustainable future for all.

FAQs

1. What is the difference between exponential and logistic growth? Exponential growth assumes unlimited resources, resulting in a continuously accelerating growth rate. Logistic growth incorporates carrying capacity, leading to a slowing growth rate as the population approaches its environmental limit.

2. What is the demographic transition model, and what are its stages? It describes the shift in birth and death rates as societies develop, progressing through stages of high stationary, early expanding, late expanding, low stationary, and potentially declining populations.

3. How does healthcare affect population growth? Improved healthcare reduces death rates, particularly infant mortality, leading to higher population growth. Access to reproductive healthcare influences birth rates.

4. What role does education play in population dynamics? Increased education, especially for women, is often correlated with lower birth rates due to increased awareness of family planning and greater economic opportunities.

5. What are some government policies that can influence population growth? Family planning programs, incentives for larger or smaller families, and immigration regulations are examples.

6. How does migration impact population growth? Immigration increases population size, while emigration decreases it. Migration patterns are influenced by "push" and "pull" factors.

7. What is carrying capacity? It's the maximum population size that an environment can sustainably support, considering available resources and environmental limits.

8. What are some global population trends? Global population continues to grow, but the rate of increase is slowing. Significant regional variations exist.

9. Why is understanding population growth important? It's critical for informed decision-making regarding resource allocation, environmental sustainability, economic planning, and social policies.

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section 5 1 how populations grow: Calculus Volume 3 Edwin Herman, Gilbert Strang, 2016-03-30 Calculus is designed for the typical two- or three-semester general calculus course,

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section 5 1 how populations grow: Using Science to Improve the BLM Wild Horse and Burro Program National Research Council, Division on Earth and Life Studies, Board on Agriculture and Natural Resources, Committee to Review the Bureau of Land Management Wild Horse and Burro Management Program, 2013-10-04 Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward reviews the science that underpins the Bureau of Land Management's oversight of free-ranging horses and burros on federal public lands in the western United States, concluding that constructive changes could be implemented. The Wild Horse and Burro Program has not used scientifically rigorous methods to estimate the population sizes of horses and burros, to model the effects of management actions on the animals, or to assess the availability and use of forage on rangelands. Evidence suggests that horse populations are growing by 15 to 20 percent each year, a level that is unsustainable for maintaining healthy horse populations as well as healthy ecosystems. Promising fertility-control methods are available to help limit this population growth, however. In addition, science-based methods exist for improving population estimates, predicting the effects of management practices in order to maintain genetically diverse, healthy populations, and estimating the productivity of rangelands. Greater transparency in how science-based methods are used to inform management decisions may help increase public confidence in the Wild Horse and Burro Program.

section 5 1 how populations grow: Population Dynamics of Senegal National Research Council, Division of Behavioral and Social Sciences and Education, Commission on Behavioral and Social Sciences and Education, Working Group on Senegal, 1995-01-01 This volume, the last in the series Population Dynamics of Sub-Saharan Africa, examines key demographic changes in Senegal over the past several decades. It analyzes the changes in fertility and their causes, with comparisons to other sub-Saharan countries. It also analyzes the causes and patterns of declines in mortality, focusing particularly on rural and urban differences.

section 5 1 how populations grow: *The Limits to Growth* Donella H. Meadows, 1972 Examines the factors which limit human economic and population growth and outlines the steps necessary for achieving a balance between population and production. Bibliogs

section 5 1 how populations grow: *Population Growth and Economic Development* National Research Council, Division of Behavioral and Social Sciences and Education, Commission on Behavioral and Social Sciences and Education, Committee on Population, Working Group on Population Growth and Economic Development, 1986-02-01 This book addresses nine relevant questions: Will population growth reduce the growth rate of per capita income because it reduces the per capita availability of exhaustible resources? How about for renewable resources? Will population growth aggravate degradation of the natural environment? Does more rapid growth reduce worker output and consumption? Do rapid growth and greater density lead to productivity gains through scale economies and thereby raise per capita income? Will rapid population growth reduce per capita levels of education and health? Will it increase inequality of income distribution? Is it an important source of labor problems and city population absorption? And, finally, do the economic effects of population growth justify government programs to reduce fertility that go beyond the provision of family planning services?

section 5 1 how populations grow: Population Regulation Robert H. Tamarin, 1978

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section 5 1 how populations grow: Populations in a Seasonal Environment Stephen D. Fretwell, 1972-07-21 Most organisms live in a seasonal environment. During their life cycles, some species face seasons of cold and heat, aridity and abundant rainfall, migration and stable residence, breeding and nonbreeding. Populations grow and decline as supplies of materials essential to their survival wax and wane. Such qualitative truths as these flow obviously from field observations. In this original monograph, Stephen Fretwell analyzes the highly complex interaction between a population and a regularly varying environment in an attempt to define and measure seasonality as a critical parameter in the general theory of population regulation. Concerned primarily with the size and the habitat distribution of populations, Professor Fretwell develops simple models that, when applied to specific populations, usually of birds, demonstrate the effect of seasonal variations on the regulation of populations. He maintains that seasonality, as a concept, is essential to a full understanding of environmental interaction. During the course of his exposition, the author offers several new hypotheses, including theories affecting the breeding, numbers, distribution, and diversity of wintering birds, and a theory affecting the body size of sparrows.

section 5 1 how populations grow: Poverty in the Philippines Asian Development Bank, 2009-12-01 Against the backdrop of the global financial crisis and rising food, fuel, and commodity prices, addressing poverty and inequality in the Philippines remains a challenge. The proportion of households living below the official poverty line has declined slowly and unevenly in the past four decades, and poverty reduction has been much slower than in neighboring countries such as the People's Republic of China, Indonesia, Thailand, and Viet Nam. Economic growth has gone through boom and bust cycles, and recent episodes of moderate economic expansion have had limited impact on the poor. Great inequality across income brackets, regions, and sectors, as well as unmanaged population growth, are considered some of the key factors constraining poverty reduction efforts. This publication analyzes the causes of poverty and recommends ways to accelerate poverty reduction and achieve more inclusive growth. it also provides an overview of current government responses, strategies, and achievements in the fight against poverty and identifies and prioritizes future needs and interventions. The analysis is based on current literature and the latest available data, including the 2006 Family Income and Expenditure Survey.

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section 5 1 how populations grow: *The Population Bomb* Paul R. Ehrlich, 1971

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unprecedented scrutiny that added new dimensions to the complex issues considered in this report. The Future of the Public's Health in the 21st Century reaffirms the vision of Healthy People 2010, and outlines a systems approach to assuring the nation's health in practice, research, and policy. This approach focuses on joining the unique resources and perspectives of diverse sectors and entities and challenges these groups to work in a concerted, strategic way to promote and protect the public's health. Focusing on diverse partnerships as the framework for public health, the book discusses: The need for a shift from an individual to a population-based approach in practice, research, policy, and community engagement. The status of the governmental public health infrastructure and what needs to be improved, including its interface with the health care delivery system. The roles nongovernment actors, such as academia, business, local communities and the media can play in creating a healthy nation. Providing an accessible analysis, this book will be important to public health policy-makers and practitioners, business and community leaders, health advocates, educators and journalists.

section 5 1 how populations grow: Communities in Action National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Board on Population Health and Public Health Practice, Committee on Community-Based Solutions to Promote Health Equity in the United States, 2017-04-27 In the United States, some populations suffer from far greater disparities in health than others. Those disparities are caused not only by fundamental differences in health status across segments of the population, but also because of inequities in factors that impact health status, so-called determinants of health. Only part of an individual's health status depends on his or her behavior and choice; community-wide problems like poverty, unemployment, poor education, inadequate housing, poor public transportation, interpersonal violence, and decaying neighborhoods also contribute to health inequities, as well as the historic and ongoing interplay of structures, policies, and norms that shape lives. When these factors are not optimal in a community, it does not mean they are intractable: such inequities can be mitigated by social policies that can shape health in powerful ways. Communities in Action: Pathways to Health Equity seeks to delineate the causes of and the solutions to health inequities in the United States. This report focuses on what communities can do to promote health equity, what actions are needed by the many and varied stakeholders that are part of communities or support them, as well as the root causes and structural barriers that need to be overcome.

section 5 1 how populations grow: Growing Populations, Changing Landscapes National Academy of Sciences, Chinese Academy of Sciences, Indian National Science Academy, 2001-06-12 As the world's population exceeds an incredible 6 billion people, governmentsâ€and scientistsâ€everywhere are concerned about the prospects for sustainable development. The science academies of the three most populous countries have joined forces in an unprecedented effort to understand the linkage between population growth and land-use change, and its implications for the future. By examining six sites ranging from agricultural to intensely urban to areas in transition, the multinational study panel asks how population growth and consumption directly cause land-use change, and explore the general nature of the forces driving the transformations. Growing Populations, Changing Landscapes explains how disparate government policies with unintended consequences and globalization effects that link local land-use changes to consumption patterns and labor policies in distant countries can be far more influential than simple numerical population increases. Recognizing the importance of these linkages can be a significant step toward more effective environmental management.

section 5 1 how populations grow: Marine Metapopulations Jacob P. Kritzer, Peter F. Sale, 2010-07-20 Technological improvements have greatly increased the ability of marine scientists to collect and analyze data over large spatial scales, and the resultant insights attainable from interpreting those data vastly increase understanding of poplation dynamics, evolution and biogeography. Marine Metapopulations provides a synthesis of existing information and understanding, and frames the most important future directions and issues. - First book to systematically apply metapopulation theory directly to marine systems - Contributions from leading

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section 5 1 how populations grow: Population, Land Use, and Environment National Research Council, Division of Behavioral and Social Sciences and Education, Center for Economics, Governance, and International Studies, Committee on the Human Dimensions of Global Change, Panel on New Research on Population and the Environment, 2005-10-15 Population, Land Use, and Environment: Research Directions offers recommendations for future research to improve understanding of how changes in human populations affect the natural environment by means of changes in land use, such as deforestation, urban development, and development of coastal zones. It also features a set of state-of-the-art papers by leading researchers that analyze population-land useenvironment relationships in urban and rural settings in developed and underdeveloped countries and that show how remote sensing and other observational methods are being applied to these issues. This book will serve as a resource for researchers, research funders, and students.

section 5 1 how populations grow: Sensitivity Analysis: Matrix Methods in Demography and Ecology Hal Caswell, 2019-04-02 This open access book shows how to use sensitivity analysis in demography. It presents new methods for individuals, cohorts, and populations, with applications to humans, other animals, and plants. The analyses are based on matrix formulations of age-classified, stage-classified, and multistate population models. Methods are presented for linear and nonlinear, deterministic and stochastic, and time-invariant and time-varying cases. Readers will discover results on the sensitivity of statistics of longevity, life disparity, occupancy times, the net reproductive rate, and statistics of Markov chain models in demography. They will also see applications of sensitivity analysis to population growth rates, stable population structures, reproductive value, equilibria under immigration and nonlinearity, and population cycles. Individual stochasticity is a theme throughout, with a focus that goes beyond expected values to include variances in demographic outcomes. The calculations are easily and accurately implemented in matrix-oriented programming languages such as Matlab or R. Sensitivity analysis will help readers create models to predict the effect of future changes, to evaluate policy effects, and to identify possible evolutionary responses to the environment. Complete with many examples of the application, the book will be of interest to researchers and graduate students in human demography

and population biology. The material will also appeal to those in mathematical biology and applied mathematics.

section 5 1 how populations grow: Population-Based Nursing Ann L. Cupp Curley, Patty A. Vitale, 2011-10-19 Print+CourseSmart

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section 5 1 how populations grow: Pristine Seas Enric Sala, Leonardo DiCaprio, 2015 National Geographic Explorer-in-Residence Enric Sala takes readers on an unforgettable journey to 10 places where the ocean is virtually untouched by man, offering a fascinating glimpse into our past and an inspiring vision for the future. From the shark-rich waters surrounding Coco Island, Costa Rica, to the iceberg-studded sea off Franz Josef Land, Russia, this incredible photographic collection showcases the thriving marine ecosystems that Sala is working to protect. Offering a rare glimpse into the world's underwater Edens, more than 200 images take you to the frontier of the Pristine Seas expeditions, where Sala's teams explore the breathtaking wildlife and habitats from the depths to the surface--thriving ecosystems with healthy corals and a kaleidoscopic variety of colorful fish and stunning creatures that have been protected from human interference. With this dazzling array of photographs that capture the beauty of the water and the incredible wildlife within it, this book shows us the brilliance of the sea in its natural state.--

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information on the goals and structure of the text can be found in the preface.

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section 5 1 how populations grow: Population and Climate Change Brian C. O'Neill, F. Landis MacKellar, Wolfgang Lutz, 2005-09-29 Population and Climate Change provides the first systematic in-depth treatment of links between two major themes of the 21st century: population growth (and associated demographic trends such as aging) and climate change. It is written by a multidisciplinary team of authors from the International Institute for Applied Systems Analysis who integrate both natural science and social science perspectives in a way that is comprehensible to members of both communities. The book will be of primary interest to researchers in the fields of climate change, demography, and economics. It will also be useful to policy-makers and NGOs dealing with issues of population dynamics and climate change, and to teachers and students in courses such as environmental studies, demography, climatology, economics, earth systems science, and international relations.

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quandaries. Making Kin Not Population ends the silence on these issues with essays from leading anti-racist, ecologically-concerned, feminist scholars. Though not always in accord, these contributors provide bold analyses of complex issues of intimacy and kinship, from reproductive justice to environmental justice, and from human and nonhuman genocides to new practices for making families and kin. This timely work offers vital proposals for forging innovative personal and public connections in the contemporary world.

section 5 1 how populations grow: Changing Numbers, Changing Needs National Research Council, Division of Behavioral and Social Sciences and Education, Commission on Behavioral and Social Sciences and Education, Committee on Population, 1996-10-11 The reported population of American Indians and Alaska Natives has grown rapidly over the past 20 years. These changes raise questions for the Indian Health Service and other agencies responsible for serving the American Indian population. How big is the population? What are its health care and insurance needs? This volume presents an up-to-date summary of what is known about the demography of American Indian and Alaska Native populationâ€their age and geographic distributions, household structure, employment, and disability and disease patterns. This information is critical for health care planners who must determine the eligible population for Indian health services and the costs of providing them. The volume will also be of interest to researchers and policymakers concerned about the future characteristics and needs of the American Indian population.

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population trends described by the estimates and projections presented in World Population Prospects 2019.

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section 5 1 how populations grow: World Cities Report 2020 United Nations, 2020-11-30 In a rapidly urbanizing and globalized world, cities have been the epicentres of COVID-19 (coronavirus). The virus has spread to virtually all parts of the world; first, among globally connected cities, then through community transmission and from the city to the countryside. This report shows that the intrinsic value of sustainable urbanization can and should be harnessed for the wellbeing of all. It provides evidence and policy analysis of the value of urbanization from an economic, social and environmental perspective. It also explores the role of innovation and technology, local governments, targeted investments and the effective implementation of the New Urban Agenda in fostering the value of sustainable urbanization.

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