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Nota di contenuto	Air Dispersion Modeling: Foundations and Applications; Copyright; Contents; Preface; List of Symbols; Chapter1 Introduction; 1.1 Introduction; 1.2 Types of Air Dispersion Models; 1.2.1 Gaussian Plume Models; 1.2.2 Gaussian Puff Models; 1.2.3 Stochastic Lagrangian Particle Models; 1.2.4 Eulerian Advection and Dispersion Models; 1.2.5 Computational Fluid Dynamics; 1.3 Standard Conditions for Temperature and Pressure; 1.4 Concentration Units in the Gas Phase; 1.5 Units; 1.6 Constants and Approximately Constant Variables; 1.7 Frequently Used Greek Symbols; Problems; References Chapter 2 An Air Dispersion Modeling Primer2.1 Introduction; 2.2 Basic Concepts of Air Dispersion; 2.3 Gaussian Dispersion Model; 2.3.1 Assumptions Underlying the Gaussian Plume Concept; 2.3.2 Quantitative Description; 2.3.3 Refinements; 2.4 Plume Rise; 2.4.1 Plume Rise Correlations; 2.4.2 Critical Wind Speed; 2.4.3 Rules of Thumb; 2.5 Need for Refinements to the Basic Gaussian Plume Dispersion Model; Problems; Materlals Onllne; References; Chapter3 Air Pollutants: An Overview; 3.1 Introduction; 3.2 Types of Air Pollution; 3.2.1 Sulfur Compounds; 3.2.2 Nitrogen Compounds 3.2.3 Volatile Organic Compounds3.2.4 Inorganic Carbon; 3.2.5 Ozone; 3.2.6 Particulate Matter; 3.2.7 Metals; 3.2.8 Air Pollution and Health; 3.2.9 Global Warming; 3.2.10 Air Pollution and Visibility; 3.2.11 Odor

Nuisance; Problems; References; Chapter4 Regulation of Air Quality and Air Quality Modeling; 4.1 Introduction; 4.2 Air Quality Regulation; 4.3 Air Dispersion Modeling Guidelines; References; Chapter 5 Meteorology for Air Dispersion Modelers; 5.1 Introduction; 5.2 Structure of the Atmosphere; 5.3 Altitude Dependence of Barometric Pressure 5.4 Height Dependence of Temperature-Adiabatic Case5.4.1 Adiabatic Lapse Rate; 5.4.2 Potential Temperature; 5.5 Stability; 5.5.1 General Description of Stability; 5.5.2 Stability Parameter; 5.5.3 Diurnal Cycle of Stability; 5.6 Heat Balance; 5.7 Wind Speed Profile; 5.7.1 Case 1: Smooth Surface, Adiabatic Conditions; 5.7.2 Case 2: Rough Surface, Adiabatic Conditions; 5.7.3 Case 3: Rough Surface, Nonneutral Conditions; 5.8 Temperature Profile Revisited: Nonneutral Conditions; 5.9 Heat Balance Revisited: Stable Conditions; 5.10 Mixing Layer Height; 5.11 Concept of Turbulence 5.11.1 Basic Properties of Turbulence5.11.2 Measures of Turbulence; 5.11.3 Similarity Theory and Turbulence; 5.11.4 Covariance and Turbulence; 5.11.5 Introduction to Eddy Diffusivity and Gradient Transport Theory; 5.12 Special Topics in Meteorology; 5.12.1 Convective Cycles: Qualitative Description; 5.12.2 Internal Boundary Layer: Qualitative Description; 5.12.3 Plume Shapes; 5.12.4 Virtual Temperature; 5.13 Advanced Topics in Meteorology; 5.13.1 Convective Cycles: Quantitative Description; 5.13.2 Simple Convective Boundary Layer Model; 5.13.3 Internal Boundary Layer: Quantitative Description 5.13.4 Effect of Complex Terrain in Meteorology

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## Sommario/riassunto

A single reference to all aspects of contemporary air dispersion modeling The practice of air dispersion modeling has changed dramatically in recent years, in large part due to new EPA regulations. Current with the EPA's 40 CFR Part 51, this book serves as a complete reference to both the science and contemporary practice of air dispersion modeling. Throughout the book, author Alex De Visscher guides readers through complex calculations, equation by equation, helping them understand precisely how air dispersion models work, including such popular models as the EPA's AERMOD and

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