

# **Contents**

List of Abbreviations.....	<b>18</b>
List of maps.....	<b>21</b>
List of Figures.....	<b>22</b>
List of Tables.....	<b>26</b>
<b>Foreword.....</b>	<b>32</b>
<b>Authors.....</b>	<b>35</b>
<b>Introduction.....</b>	<b>41</b>
<b>PART 1. THE THEORETICAL BASIS FOR PROGNOSTIC SYNTHESIS.....</b>	<b>65</b>
<b>    Chapter 1. Long-Term Dynamics     of the Regional Economic Systems.....</b>	<b>67</b>
1.1. Technologies as a Factor of Economic Dynamics.....	<b>67</b>
1.2. Long Waves in the Russian Far East Economy.....	<b>76</b>
<b>    Chapter 2. Long-Term Forecasting Concepts and Models.....</b>	<b>86</b>
2.1. Methods and Models of Long-Term Forecasting.....	<b>89</b>
2.2. Methods of Scientific and Technological Forecasting.....	<b>94</b>
2.3. Synthetic Forecasting for Regional Development.....	<b>104</b>
<b>PART 2. THE PACIFIC RUSSIA'S DEVELOPMENT POTENTIAL AND CONCEPT</b>	
<b>    Chapter 3. The Region's Economic Potential.....</b>	<b>113</b>
3.1. Structural and Dynamic Characteristics.....	<b>115</b>
3.2. Industry.....	<b>115</b>
3.3. Agriculture.....	<b>120</b>
3.4. Transport.....	<b>133</b>
3.5. Foreign Economic Activity.....	<b>141</b>

<b>Chapter 4. Socio-Demographic Potential.....</b>	<b>149</b>
4.1. Demographic Potential.....	154
4.2. Social Potential.....	154
<b>Chapter 5. The Region's Natural Resource Potential .....</b>	<b>161</b>
5.1. The Resource Scope.....	175
5.2. Transforming the Natural Resource Potential.....	176
5.3. The Russian Far East's Natural Resource Potential: The Stance in the Asia-Pacific.....	180
<b>Chapter 6. Innovative-Technological and Scientific-Educational Potential.....</b>	<b>185</b>
6.1. Russia's Scientific and Technical Complex.....	195
6.2. The Russian Far East's Scientific and Educational Potential.....	196
6.3. The Russian Far East's Innovative and Technological Potential .....	211
<b>Chapter 7. The Long-Term Regional Development Concept.....</b>	<b>221</b>
7.1. General Provisions.....	234
7.2. The Conceptual Cycle.....	234
7.3. The Pacific Russia's Long-Term Development Concept.....	237
7.4. Scenarios for the Region's Long-Term Development.....	250
<b>PART 3. TECHNOLOGICAL UPGRADING AND FORMATION OF COMPETITIVE NICHES.....</b>	<b>269</b>
<b>Chapter 8. Energy of the Future.....</b>	<b>271</b>
8.1. Global Trends and Prospects for the Energy Sector.....	271
8.2. Advanced Energy Technologies.....	280
8.3. The Long-Term Trend in the Russian Energy Sector.....	290
8.4. Forecast of Energy Technologies Development in Russia...	293
8.5. The Future Energy Sector in the Russian Far East.....	303
<b>Chapter 9. Mineral Resources Complex and New Materials.....</b>	<b>312</b>
9.1. Global and National Trends.....	312
9.2. Scientific and Technological Designs for the Pacific Russia's Mineral Resource Complex.....	323

9.3. Technological Prospects for the Region's Mineral Resource Complex.....	331
9.4. Developing the Pacific Russia's Mineral Resource Complex until 2050.....	339
9.5. New Materials.....	343
<b>Chapter 10. Transport and Transport Corridors.....</b>	<b>352</b>
10.1. Global Trends and Prospects for the Transport Sector.....	352
10.2. Long-Term Forecast of Transport Development in Russia.....	367
10.3. Transport Development Prospects in the Russian Far East.....	374
<b>Chapter 11. Ocean Resources and Technology.....</b>	<b>382</b>
11.1. Resources of the World Ocean and Far Eastern Seas.....	382
11.2. Development Prospects of Ocean Resources in the Russian Far East .....	387
<b>Chapter 12. Biotechnology and Bioresources.....</b>	<b>397</b>
12.1. Trends in Global and National Markets.....	397
12.1.1. Forest Resources.....	397
12.1.2. Water and Biological Resources.....	401
12.2. The Global and National Technological Trend.....	405
12.2.1. Forest Resources.....	405
12.2.2. Marine Biotechnology and Water Biological Resources.....	412
12.3. Biotechnology and Prospects for the Use of Biological Resources in the Russian Far East.....	418
12.3.1. Land-Based Biological Resources.....	419
12.3.2. Biotechnology and Water Biological Resources.....	424
12.3.3. Aquaculture Development.....	430
12.4. The Program to Provide Transformation of the Regional Complex for Biological Resources Use.....	433
<b>Chapter 13. Agriculture and Food Security.....</b>	<b>439</b>
13.1. Global Trends in Food Supply and Agriculture.....	439
13.2. Trends in Food Supply in the Russian Far East.....	446

13.3. Prospects for Scientific and Technological Modernization.....	452
13.4. Future Trends in Regional Agriculture and Food Supply... ..	460
13.5. Upgrading of Economic Institutions.....	468
<b>Chapter 14. Information Systems in Regional Development.....</b>	<b>474</b>
14.1. International Experience and Forecast of Developing Information and Communications Systems.....	475
14.2. Prospects for Information Technology.....	485
14.3. Russian Experience and Forecast of Developing Information and Communications Systems.....	492
14.4. Developing Information and Communications Systems of the Russian Far East.....	506
<b>Chapter 15. Natural Environment and Ecology.....</b>	<b>512</b>
15.1. Global Trends.....	512
15.2. Regional Environmental Trends as Compared to Global and National Ones.....	521
15.3. Natural Environment and Ecology of the Russian Far East in the Long Term.....	526
<b>PART 4. SOCIAL DEVELOPMENT AND HUMAN CAPITAL....</b>	<b>533</b>
<b>Chapter 16. Science, Education, and Innovation Environment.....</b>	<b>535</b>
16.1. Global Trends.....	536
16.2. Prospective Organization of Science and Education in Russia.....	553
16.3. Science and Education in the Russian Far East: the Long-Term Prospect.....	559
16.4. The Region's Innovation Environment .....	567
<b>Chapter 17. Healthy Population: Developing the Healthcare Service.....</b>	<b>572</b>
17.1. Healthcare Service Organization.....	573
17.2. Advanced Health Technologies.....	582
17.3. Health of the Population and Medicine of the Future in the Russian Far East.....	588

<b>Chapter 18. Population and Social Development in the Russian Far East.....</b>	<b>596</b>
18.1. Population.....	596
18.2. Social Development.....	603
<b>PART 5. SUB-GLOBAL SPATIAL POSITIONING OF THE PACIFIC RUSSIA.....</b>	<b>615</b>
<b>Chapter 19. Integration Trends in the Asia-Pacific Region.....</b>	<b>617</b>
19.1. Trade and Economic Cooperation.....	617
19.2. Forms and Mechanisms of Integrating Cooperation.....	623
<b>Chapter 20. Trends in All-Russia Cooperation with East Asian Economies.....</b>	<b>638</b>
<b>Chapter 21. Prospects of Economic Integration between the Pacific Russia and East Asian Economies.....</b>	<b>658</b>
<b>PART 6. MODERNIZATION OF ECONOMIC SPACE.....</b>	<b>669</b>
<b>Chapter 22. The Concept of Spatial Organization of the Economy.....</b>	<b>671</b>
22.1. Trends in the Formation of Spatial Economic Structures...	671
22.2. Spatial Differentiation of the Conditions for Economic Development and Growth.....	675
<b>Chapter 23. Economic and Technological Development within the Southern Arc.....</b>	<b>705</b>
23.1. Primorsky Krai.....	705
23.2. Khabarovsk Krai.....	717
23.3. Amur Oblast.....	729
23.4. Jewish Autonomous Oblast.....	746
<b>Chapter 24. Economic and Technological Development within the Northern Arc.....</b>	<b>756</b>
24.1. Republic of Sakha (Yakutia).....	757
24.2. Kamchatka Krai.....	775
24.3. Magadan Oblast.....	785

24.4. Chukotka Autonomous Okrug.....	795
24.5. Sakhalin Oblast.....	801
<b>PART 7. SCENARIOS FOR THE FUTURE.....</b>	<b>813</b>
<b>Chapter 25. Economic Dynamics and Structural Modernization.....</b>	<b>815</b>
25.1. Scenarios for the Forecast.....	815
25.2. Instrumental Methods of Forecasting.....	824
25.3. Analyzing the Results of Macroeconomic Forecast.....	828
<b>Chapter 26. Fundamental Research Studies in the Russian Far East: Providing the Technological Potential.....</b>	<b>838</b>
26.1. Biological Studies.....	840
26.2. Geological Studies.....	849
26.3. Research in Chemistry and New Materials.....	858
26.4. Research in Oceanography, Climate Change and Global Disasters.....	862
26.5. Research in Physics, Telecommunications, and Engineering Sciences.....	864
<b>Institutional Transformations and Scientific-Technical Organization (in place of Conclusion).....</b>	<b>869</b>
<b>References.....</b>	<b>879</b>