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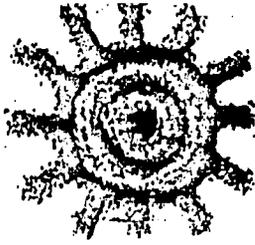
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DESERTIFICATION :  
A World Bibliography

S O U T H A M E R I C A  
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for

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Pre-Conference Meeting of the IGU Working Group on Desertification  
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## ACKNOWLEDGMENTS

As Editor, my greatest obligation in the preparation of this bibliography for publication is to Mrs. Jean Mills, Research Assistant, Office of Arid Lands Studies, who virtually lived for five months in the University of Arizona Libraries verifying information submitted by the several regional contributors, and then barricaded herself in her office while she reconciled a variety of styles to the format of our computer program that stores and retrieves from the data base comprising the Arid Lands Information System (ALIS).

The technical staff — Lynn Lybeck, Systems Analyst, Julie V. Garrettson in charge of terminal operations, and Eleanor Smith who assisted her with data entry — produced the document you hold in your hands, all of them sharing the often tedious work of modifying the computer program where necessary, entering the information on the terminal, reading proof three times, and doing the preliminary preparation of printouts for the photoreduction and photoreproduction that enabled us to compress these hundreds of citations into manageable size. My deepest thanks to all, not least for the interest they took in the project and in the subject as well. I hope each thinks of himself as a minor authority on desertification.

The backup support of the University of Arizona, and particularly that of the Office of Arid Lands Studies, is greatly appreciated. Our Director, Dr. Jack D. Johnson, stabilized the disruptions to the Office, inevitable in a project of this magnitude, by his enthusiastic cooperation. Mary Michael, Information Specialist, and Helen Kassander, Research Assistant, helped us meet our deadline by relinquishing their share of the technical staff's time over a period of months.

I am grateful to my colleague, Dr. Andrew W. Wilson, University of Arizona Department of Geography, Regional Development, and Urban Planning, and Vice-Chairman of the IGU Working Group on Desertification, for his counsel and advice during the year we worked on the bibliography, and to Professor Jack W. Mabbutt, Chairman, Department of Geography, University of New South Wales, Kensington, and Chairman of the IGU Working Group, for his willingness to allow me to go forward on the project in my own way. His keen eye and impeccable judgment sharpened my own approach to the undertaking.

To the collaborators throughout the arid world, as noted elsewhere herein, those recognized authorities on the regions represented by their citation contributions, who responded bravely to all my anguished cables to hurry, hurry, my very best thanks. The bibliography is really theirs, expressing as it does their understanding of particular environments and the impact of desertification thereon.

-Patricia Paylore

Tucson

July 4, 1976

## EDITOR'S PREFACE

This bibliography is a selection of largely recent information on worldwide desertification, a greatly expanded listing from that which accompanied a paper on the subject first published by the University of Arizona's Office of Arid Lands Studies in 1973\*. It has been compiled and edited for the 23rd International Geographical Congress, Moscow, 1976, more particularly for the Pre-Conference Meeting of the IGU Working Group on Desertification in Ashkhabad, July 1976, since it was under its aegis that the task was undertaken in the summer of 1975.

The Working Group came into being at the IGU's Montreal Congress, 1972, as a successor to the former Commission on the Geography of Arid Lands. Its stated aim was "to collect evidence on the nature and causes of environmental changes constituting an extension of deserts into marginal areas or an intensification of desert conditions within arid regions." Two subsequent field meetings of the Working Group were held: in Alice Springs in the early winter of 1974; and in Cambridge, England, in the early fall of 1975. When the Editor was co-opted to the Working Group, it was agreed that she would depend to a large degree on contributions from various regional collaborators for coverage of specific areas. Those persons are listed here, many of whom are also authors of the brief introductory remarks which precede most sections of the bibliography itself:

Worldwide:	Ronald F. Peel, University of Bristol
Saharan Region	A. T. Grove, Cambridge University (English)
and Sahel:	Monique Mainguet, Reims University (French)
	Horst Mensching, University of Hamburg )
	F. N. Ibrahim, University of Hamburg ) (German)
	Wolfgang Meckelein, University of Stuttgart )
East Africa:	Leonard Berry, Clark University, Worcester
Southern Africa:	Peter D. Tyson, University of Witwatersrand
Middle East:	Peter Beaumont, University of Durham
USSR:	Michael Petrov, Leningrad University
Pakistan:	Mushtaqur Rahman, Iowa State University
India:	H. S. Mann, Central Arid Zone Research Institute, Jodhpur
Australia:	J. A. Mabbutt, University of New South Wales
South America:	Hans J. Schneider, University of New South Wales
North America:	Andrew W. Wilson, University of Arizona

Many of the Regional Organizers have been assisted by local correspondents, who are in effect Corresponding Members of the Working Group.

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\* Sherbrooke, W. C. / Paylore, P. (1973) World Desertification: Cause and Effect. A Literature Review and Annotated Bibliography. University of Arizona, Office of Arid Lands Studies, Arid Lands Resource Information Paper 3. 168 p.

The following framework was suggested to the regional contributors early in the project, as a guide to selection of references. While not all items are represented in each gathering, the presence of citations dealing with any of these concepts can be determined from the index for each region.

**A. Natural Trends:**

1. Climatic changes in the historical period
2. Hydrologic changes
3. Changes in landforms due to the action of water
4. Changes in landforms due to the action of wind
5. Changes in soils
6. Changes in natural vegetation

**B. Man's Influence on the Processes of Desertification:**

1. Agriculture, dryland or irrigated
2. Pastoralism, rural settlement, and nomadism
3. Forestry, with emphasis on collection of fuel
4. Urbanization
5. Population changes
6. Mining (including oil and gas) and pipeline construction
7. Transportation, including construction of roads, railways, airfields
8. Tourism and recreation

**C. Preservational Measures:**

1. Studies of status and trend of the environment
2. Regional assessments of natural resources
3. Studies of natural hazards
4. Establishment of natural parks and reserves
5. Other controls of land use

**D. Preventive and Remedial Measures:**

1. Climate: climatic stress, rainmaking, evaporation suppression, shelterbelts
2. Water supplies: inventories of water resources, water balance or hydrologic cycle, improvement of supplies for drinking, stock or irrigation; water harvesting schemes
3. Erosion control: stabilization of dunes and drift sands, monitoring of processes, measures against water and wind erosion
4. Improvement of desert vegetative cover: surveys of the extent of degradation, range and grazing studies, revegetation of bare areas, pasture improvement, afforestation
5. Control of land use: pastoral, dryland / irrigated agriculture
6. Control of population and settlement: nomads, rural settlement, urban planning, communications
7. Development of alternative resources: regional development, mining, industry tourism, recreation, health care

It was also suggested that we attempt to keep within a timeframe of the past decade. This was done to a large extent, but earlier papers of a classic nature are still included where it is generally agreed that their presentation has not been improved upon.

Because of the massive infusion of bibliographic information, which (even with what, at times, must have appeared to be brutal editorial cuts) still far exceeds the total number of references envisaged when we began, we have had to be arbitrary in the manner in which we have handled some of the information. Where we have departed radically from the format employed to display the greatest percentage of information, such as the USSR, we have appended an explanation following the regional contributor's Introduction. We have included several hundred documents from our own Arid Lands Information System (ALIS) to enhance the coverage submitted by our regional colleagues.

Much work was done at Arizona to bring these hundreds of references into the format required by our computer program. Many references were dropped because of lack of adequate information to identify and locate copies should users so require. For those without the services of skilled documentalists and/or bibliographers to call upon, it has always seemed to us that our meticulous and sometimes fussy insistence on full bibliographical information is the sine qua non of good bibliography. In this respect, while much of the documentation in this bibliography was very difficult indeed, we believe that the smallest percentage humanly possible is included that has not been verified by our staff. We trust, therefore, that because of this care, users will find the full documentation more readily accessible than they would otherwise.

Indexing (except for the USSR) was done from the Thesaurus of Arid Lands Terminology (c1974), developed and used by the Office of Arid Lands Studies for its computerized data bank; and to make the use of the bibliography less cumbersome, subject keywords and authors appear as computerized lists following each section. The documentation from the USSR was sorted out into ten overall categories, and no indexing of individual citations was undertaken.

An effort was made to eliminate all references that did not contribute to an understanding of the phenomenon of desertification itself, rather than to permit the bibliography to become a general arid lands compilation. That we did not always succeed must be attributed not only to our inability to distinguish at times, but also to the disagreements and confusion existing among desert experts as to exactly what constitutes desertification. For those users who miss their favorite citations - their own or others - we ask you to take this constraint into account.

The Editor takes full responsibility for the choice of references carried, and for all shortcomings of coverage or format. I hope the latter will be outweighed by the work's overall usefulness at this critical time in the world's understanding of a biological and physical process that is affecting the lives of millions.

SOUTH AMERICA



**Professor Hans J. Schneider\***  
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Australia

## SOUTH AMERICA

The arid regions of South America occupy a relatively small proportion of the continent, about twenty percent, from the extreme Atacama to the semiarid regions of Brazil, Argentina, and Chile. The major part of these arid lands is concentrated in a great diagonal across the continent. A second important semiarid area is found in northeastern Brazil, and a much smaller island of aridity occurs on the Atlantic coasts of Colombia and Venezuela.

1) Extreme arid conditions prevail along the Peruvian and Chilean coasts and in inland areas from a few degrees south of the equator to about 27°S. Desertification problems are particularly acute in and around irrigated valleys and other settled areas. Increased mining activities and a growing urban population are causing considerable stress on the natural environment, particularly in connection with the need for water.

2) Toward the southeast of the Peruvian-Chilean deserts, arid and semiarid lands extend diagonally across the Andes into the highlands of Peru and Bolivia, the arid regions of northwestern Argentina, and the semiarid margin of the Pampa. Semiarid lands in Patagonia extend to the Atlantic coast near the southern tip of the South American continent. Rainfall is highly variable over much of this large area, adversely affecting agriculture and livestock activities.

3) The semiarid region in north central Chile, south of the Atacama, suffered greatly from recent drought. Considerable loss of livestock and cropland led to population emigration, and water had to be rationed, thus restricting industrial activities and causing hardship for urban populations as well. Desertification impact on the natural environment was considerable, and the rate of recovery under more favorable conditions could be slow.

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\* Many institutions and individuals contributed to the South American section of this bibliography. Particularly valuable was the help of the following colleagues who accepted responsibility to act as local correspondents, thus making possible this compilation:

Argentina: Moira B. Alessandro  
Marta E. Quiroga  
Dr. Virgilio Roig

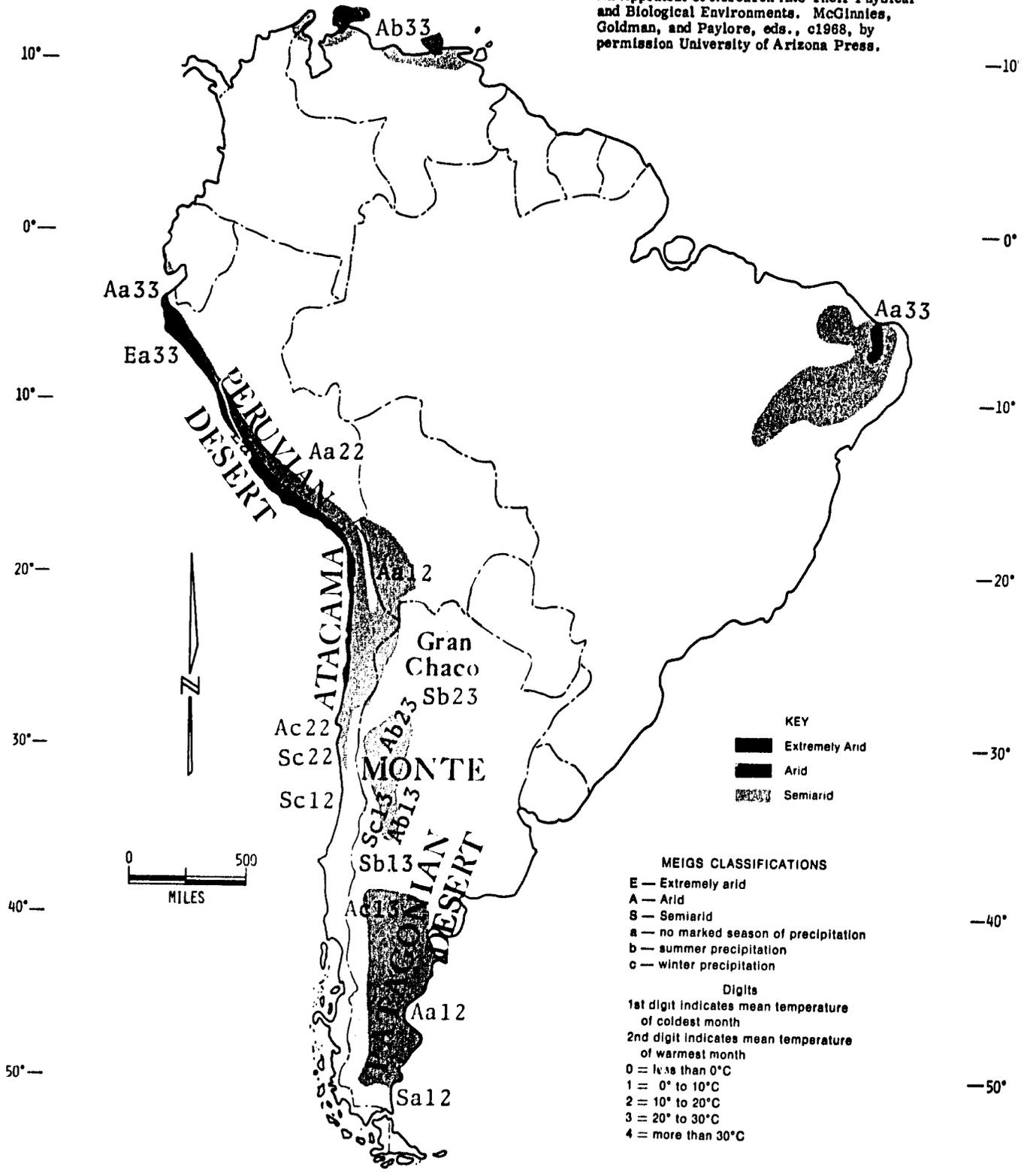
Brazil: Dr. Manuel Correia de Andrade

Chile: Dr. Orlando Pena  
Prof. Herman Zepeda

Peru: Dr. Efraín Orbegozo

Venezuela: Dr. Jesus A. Aguilera

Reprinted from DESERTS OF THE WORLD; An Appraisal of Research into Their Physical and Biological Environments. McGinnies, Goldman, and Paylore, eds., c1968, by permission University of Arizona Press.



Arid Lands of South America (after Meigs)

4) In northeastern Brazil a large semiarid area extends over seven states, some 1.4 million sq km in all. This region suffers from irregular precipitation and recurring drought, interspersed with more humid periods. During a drought little rain falls over a period of several years, severely affecting the largely rural life of the region. The peasant sector has been hardest hit by these droughts, and several million persons have been forced to migrate in the last few decades. Research into a wide range of problems related to desertification has been carried out, and some progress has been made, particularly on meteorological aspects of drought in the region.

5) Research into the problems of the arid and semiarid Atlantic littoral of Colombia and Venezuela has progressed, especially in meteorological and climatological aspects.

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Research into the specific problems of arid regions has been carried out for many years in the major areas listed above, mainly where aridity or semiarid conditions prevail throughout, such as the coastal deserts of Peru and Chile and the Argentine Pampa. More recently, particular attention is being given to desertification in marginally arid regions which can be linked to increased prospecting and exploitation of natural resources, population growth, and regional development efforts. Combined effects of these events have intensified environmental stress, particularly in the marginally arid areas. This illustrates the need for more specific research in regions such as the semiarid Pampa of Argentina, the drought polygon of northeastern Brazil, and the Norte Chico of Chile, all of which have suffered desertification in different forms and degrees in recent years.

It is hoped that the following list of references on desertification and related topics will be useful to researchers, giving as it does some indication of current trends of investigations into desertification in South America. A large proportion of descriptive papers, basic and informative in character, appears to confirm the necessity for more specifically oriented work on the causes and effects, extension and importance of environmental changes in the arid and semiarid regions of South America. Although a major obstacle for research in the area — the lack of reliable basic information — is being overcome through the combined efforts of individuals and governmental agencies, far greater attention to desertification will be required in the near future, considering the tremendous increase in pressure on a difficult and fragile environment, already suffering from centuries of exploitation and neglect.

**SOUTH AMERICA**

**Argentina**

## ARGENTINA

1

ABITBOL, J.

1964

BREVE INFORMACION SOBRE LA DESERTIZACION PROGRESIVA EN LAS PROVINCIAS DE CATAMARCA Y LA RIOJA (NOTE ON THE PROGRESSIVE DESERTIFICATION IN CATAMARCA AND LA RIOJA PROVINCES, ARGENTINA).

IDIA BUENOS AIRES, SUPLEMENTO 13:121-122.

OF THE 20 MILLION HECTARES IN CATAMARCA AND LA RIOJA, 70 PERCENT IS COVERED BY MOUNTAIN RANGES AND 30 PERCENT IS CLASSIFIED AS ARID AND DESERT LOWLANDS. BOTH CONTINUOUS FOREST CLEARING AND INCREASE IN GOAT POPULATION ARE RESPONSIBLE FOR DESERTIFICATION. THE PAPER DISCUSSES A NUMBER OF TECHNICAL AND ORGANIZATIONAL MEASURES TO ATTACK THE PROBLEM OF DESERTIFICATION, INCLUDING LEGISLATION AND POLITICAL, SOCIAL AND ECONOMIC ASPECTS.

LA RIOJA PROVINCE/DESERTIFICATION

2

ANIGO, A.

1965

EL SOBREPASTOREO DE LA REGION PATAGONICA, CAUSAS QUE LO ORIGINAN Y SOLUCIONES QUE SE PROPONEN (OVERGRAZING IN PATAGONIA, ITS CAUSES AND PROPOSED REMEDIES).

ARGENTINA, CONSEJO NACIONAL DE DESARROLLO, BUENOS AIRES, PROYECTOS ESPECIALES 14:16-54.

OVERGRAZING/PATAGONIAN DESERT

3

ANDERSON, D.L./DEL AGUILA, J.A./BERNARDON, A.E.

1970

LAS FORMACIONES VEGETALES EN LA PROVINCIA DE SAN LUIS (THE VEGETATION FORMATIONS IN SAN LUIS PROVINCE, ARGENTINA).

REVISTA DE INVESTIGACIONES AGROPORCUARIAS, SER. 2, BIOLOGIA Y PRODUCCION VEGETAL 7(3):153-183.

FORMATIONS DESCRIBED AND MAPPED ARE: SANDY GRASSLAND, CALDEN FOREST, ALGARROBO OPEN FOREST, CREOSOTE BUSH AND CHANAR BRUSHLAND, QUEBRACHO BLANCO AND ALGARROBO FOREST, AND SIERRAN GRASSLANDS AND FORESTS. SPECIAL EMPHASIS IS GIVEN TO GRASSES.

OALS/ARGENTINA/MONTE/SAN LUIS PROVINCE/VEGETATION TYPES

4

ANONYMOUS

1962

LA SEQUIA EN LA REGION PANPEANA HUMEDA; PREVENCION Y CONTROL DE SUS EFECTOS (DROUGHT IN THE HUMID PAMPA: PREVENTION AND CONTROL OF ITS CONSEQUENCES).

INTA, ESTACION EXPERIMENTAL AGROPECUARIA, ANGUIL, MISCELANEA 5. 9 P.

DROUGHTS/PLAINS

5

ANONYMOUS

1963

ACCION PERMANENTE PARA CONTENER LA SEQUIA Y LA ARIDEZ.

INTA, BUENOS AIRES, MISCELANEA 9. 12 P.

DROUGHTS/ARIDITY

6

ANONYMOUS

1967

ESTUDIO AGROECONOMICO DEL AREA DE SEQUIA INTENSA (AGROECONOMIC STUDY OF THE AREA AFFECTED BY INTENSE DROUGHT).

ARGENTINA, MINISTERIO DE ECONOMIA Y ASUNTOS AGRARIOS, LA PAMPA, SUBSECRETARIA DE ASUNTOS AGRARIOS, SANTA ROSA. 22 P.

DROUGHTS/AGRICULTURE/ECONOMIC IMPACT

7

ARENA, A./GUINAZU, J.

1940

LA EROSION EOLICA DE LOS SUELOS EN EL CENTRO-OESTE DE LA REPUBLICA ARGENTINA (WIND EROSION OF SOILS IN THE CENTRE-WEST OF ARGENTINA).

ARGENTINA, MINISTERIO DE AGRICULTURA Y GANADERIA, BUENOS AIRES, MISCELANEA 65.

DROUGHT CONDITIONS AFFECTED A LARGE AREA OF ARGENTINA DURING THE DECADE 1929 - 1938, ESPECIALLY THE WESTERN AND SOUTHWESTERN PART OF BUENOS AIRES PROVINCE, THE LA PAMPA TERRITORY AND THE SOUTHEAST OF CORDOBA, SAN LUIS, LA RIOJA, CATAMARCA AND SANTIAGO DEL ESTERO. THIS PAPER IS THE RESULT OF A FIELD SURVEY OF THE DROUGHT AREA AND THE SEVERITY OF WIND EROSION. AFTER EXAMINING POSSIBLE NATURAL AND HUMAN CAUSES OF EROSION, THE AUTHORS DISCUSS A WIDE RANGE OF REMEDIAL MEASURES.

WIND EROSION/SOIL EROSION/DROUGHTS/ENVIRONMENTAL IMPACT/LAND RECLAMATION/  
SOIL CONSERVATION

8

ARIAS, A.M.

1973

LA ARGENTINA SECA: RESERVA Y MANEJO DEL AGUA (DRY ARGENTINA: WATER RESERVE AND MANAGEMENT).

AGRO NUESTRO (BUENOS AIRES) 150/73. 8 P.

DISCUSSES PROBLEMS OF THE ARID AND SEMIARID ZONES IN ARGENTINA: LOW PRODUCTION, ECONOMIC IMBALANCE, DEFICIENT INTERNAL ORGANIZATION, DETERMINING A LOW LEVEL OF DEVELOPMENT COMPARED TO THE REST OF THE COUNTRY. THE INTEGRATION OF THE SEMIARID ZONE, ITS SOILS, WATER RESOURCES AND UTILIZATION, IS DISCUSSED IN GREATER DETAIL.

WATER MANAGEMENT/WATER RESOURCES/WATER CONSERVATION/SOIL TYPES/WATER UTILIZATION

9

BAUNGARDNER, H.F./FLANNERY, R.O./RIOS, M.A.

1966

THE ARGENTINIAN SITUATION: EROSION, A NATIONAL HAZARD: CONSERVATION, AN URGENT NEED.

CONGRESO PANAMERICANO SOBRE CONSERVACION DEL SUELO, 1ST, SAO PAULO, BRAZIL, P. 93-99.

EROSION/CONSERVATION/SOIL CONSERVATION

10

BERGMANN, J.F.

1971

SOIL SALINIZATION AND WELSH SETTLEMENT IN CHUBUT, ARGENTINA.

CANIEPS DE GEOGRAPHIE DE QUEBEC 35:361-369. SWRA W72-06714.

IN JULY, 1865 A BAND OF 153 WELSH SETTLERS LANDED ON THE SHORE OF CHUBUT, LOCATED IN THE ARID PATAGONIAN REGION OF ARGENTINA. THEY SOON DISCOVERED THE POTENTIAL FOR CROP IRRIGATION FROM THE CHUBUT RIVER. UNFORTUNATELY, THEIR LARGELY URBAN BACKGROUNDS FROM HUMID WALES LEFT THEM LITTLE PREPARED TO DEAL WITH THE COMPLEXITIES OF ARID REGION IRRIGATION SYSTEMS. THE CANAL SYSTEM WAS POORLY CONSTRUCTED, THE FIELDS WERE POORLY LEVELED AND IRRIGATION WATER APPLICATION AND DRAINAGE WERE INADEQUATELY CONTROLLED. BY THE TURN OF THE CENTURY, SOIL SALT ACCUMULATIONS BEGAN CURTAILING AGRICULTURAL PRODUCTIVITY. THE MAJOR REASONS FOR THE RISES IN SALINITY WERE CANAL SEEPAGE AND CROP OVERWATERING COMBINED WITH A HIGHLY SALINE GROUNDWATER. THE WELSH FARMERS HAVE CONSISTENTLY REFUSED TO IMPROVE THEIR DRAINAGE FACILITIES AND WATER APPLICATION PRACTICES. THEY HAVE VIEWED LOCAL DRAINAGE PROBLEMS AS THE RESPONSIBILITY OF THE MUNICIPALITIES. OF THE 40,000 HECTARES ORIGINALLY IRRIGATED ONLY ABOUT 18,000 HECTARES ARE LEFT IN CULTIVATION. RECLAMATION PROJECTS IN THE REGION WILL PROBABLY BE LIMITED BY THE LOW ECONOMIC VALUE OF CROP PRODUCTION IN THE CHUBUT VALLEY. (OALS)

OALS/IRRIGATION PRACTICES/SALINE SOILS/ARID LANDS/DRAINAGE/SOCIAL ASPECTS/CROP RESPONSE/CANALS/SEEPAGE/GROUNDWATER/DAMS/ARGENTINA

11

BONFILS, C.G. ET AL

1959

SUELOS Y EROSION EN LA REGION PAMPEANA SEMIARIDA (SOILS AND EROSION IN THE SEMIARID PAMPA).

REVISTA DE INVESTIGACIONES AGRICOLAS (BUENOS AIRES) 13(4):322-396.

SURVEY OF EROSION IN THE PROVINCES OF BUENOS AIRES AND LA PAMPA. CONTAINS MAP SHOWING DIFFERENT DEGREES OF EROSION IN THESE REGIONS.

SOIL EROSION/EROSION/PLAINS

12

BURGOS, J.J.

1963

EL CLIMA DE LAS REGIONES ARIDAS EN LA REPUBLICA ARGENTINA (THE CLIMATE OF THE ARID REGIONS OF ARGENTINA).

REVISTA DE INVESTIGACIONES ARGICOLAS (BUENOS AIRES) 17(4):385-405.

ATMOSPHERIC AND GEOGRAPHIC FACTORS OF ARIDITY IN ARGENTINA ARE ANALYZED. THORNTHWAITE'S HYDRIC INDEX (1948) IS USED TO ESTIMATE EXTENT AND INTENSITY OF ARIDITY. THE RESULTING CLIMATIC CLASSIFICATION TOGETHER WITH A CONSIDERATION OF THE VARYING LENGTH OF THE FROST-FREE PERIOD IS PROPOSED AS SUITED FOR AGRICULTURAL AND PASTORAL UTILIZATION. THIS METHOD WHEN EXTENDED TO THE ENTIRE COUNTRY SHOWS THAT 81 PERCENT IS AFFECTED BY VARYING DEGREES OF ARIDITY.

CLIMATE/ARID LANDS/ARIDITY INDEX/THORNTHWAITE, C.W./LAND USE

13

DE FINA, A.L. ET AL

1966

DIFUSION GEOGRAFICA DE CULTIVOS INDICES EN LA PROVINCIA DE CORDOBA Y SUS CAUSAS (GEOGRAPHIC DISTRIBUTION OF CROP-INDEXES IN CORDOBA PROVINCE AND ITS CAUSES).

ARGENTINA, INSTITUTO DE SUELOS Y AGROTECNIA, PUBLICACION 102. 45 P. MGA 19.2-53

RESULTS OF AN AGROECOLOGICAL SURVEY AT 176 LOCATIONS ARE DISCUSSED AND PRESENTED ON MAPS OF CROP-INDEXES FOR 18 CROPS (CACAO, PINEAPPLE, BANANA, ETC.). TABULATED TEMPERATURE-PRECIPITATION VALUES AND ALTITUDES OF 570 STATIONS WERE USED TO DELINEATE 21 AGROCLIMATIC DISTRICTS SHOWN ON A MAP. THE 142 CROPS THAT CAN BE GROWN IN THE 21 DISTRICTS ARE LISTED. THE SIGNIFICANCE OF THE 18 CROP-INDEXES (SHOWN GRAPHICALLY) AND THE AGROECOLOGICAL CONDITIONS OF THE PROVINCE ARE DISCUSSED. A MAP OF MEAN ANNUAL PRECIPITATION OF THE PROVINCE IS GIVEN WHICH TOGETHER WITH THE TABULATION FOR THE 570 STATIONS PARTIALLY FILLS A GAP IN THE CLIMATOLOGICAL LITERATURE OF ARGENTINA AND OF SOUTH AMERICA. ENGLISH SUMMARY P. 44.

CORDOBA PROVINCE/ARGENTINA/MONTE/CLIMATIC DATA/CROP PRODUCTION/AGRONOMY/ECOLOGY/OALS

14

GALMARINI, A.G.

1965

INVESTIGACION SOBRE LA EXISTENCIA DE POSIBLES CAMBIOS DE CLIMA EN LA PATAGONIA (STUDY OF POSSIBLE CLIMATIC CHANGES IN PATAGONIA).

ARGENTINA, CONSEJO NACIONAL DE DESARROLLO, BUENOS AIRES, PROYECTOS ESPECIALES 14. 25 P.

PATAGONIAN DESERT/CLIMATIC CHANGE

15

GALMARINI, A.G./RAFFO DEL CAMPO, J.M.

1968

CONDICIONES DE ARIDEZ Y HUMEDAD DE LA REPUBLICA ARGENTINA (CONDITIONS OF ARIDITY AND HUMIDITY IN ARGENTINA). IN INTERNATIONAL CONFERENCE ON WATER FOR PEACE, WASHINGTON, D.C., MAY 23-31, 1967.

WATER FOR PEACE 4:481-493. MGA 21.8-342.

GIVES THE BASIC CONCEPTS AND DEFINITIONS OF ARID, SEMIARID, AND HUMID ZONES, AND DESCRIBES THE IMPORTANCE OF THE WATER BALANCE, REPRESENTED BY THE RELATIONSHIP BETWEEN PRECIPITATION AND LOSSES OF WATER THROUGH EVAPORATION. BY APPLYING THE VARIOUS METHODS CHARACTERIZING THE ARIDITY INDEX, THE AUTHORS ARRIVE AT A DETERMINATION OF THE VARIOUS ZONES. THE ISOGRAMS THAT FORM THE BOUNDARIES OF EACH ARE GIVEN IN A SERIES OF SEVEN MAPS THAT SHOW THE DRY REGIONS COMPRISING 63 PERCENT OF THE CONTINENTAL AREA OF THE COUNTRY AND THE HUMID REGIONS 37 PERCENT. (OALS)

CLIMATE/OALS/ARGENTINA/ARIDITY/ARIDITY INDEX/HUMIDITY/WATER BALANCE/ MAPS

16

GALHARINI, A.G./RAPPO DEL CAMPO, J.M./AHIGO, A.

1968

INVESTIGATION OF POSSIBLE CHANGES IN THE CLIMATE OF PATAGONIA; OVERGRAZING IN THE PATAGONIA REGION: ITS CAUSES AND PROPOSED SOLUTIONS. IN INTERNATIONAL CONFERENCE ON WATER FOR PEACE, WASHINGTON, D.C., MAY 23-31, 1967.

WATER FOR PEACE 2:721-728. MGA 21.8-522.

THERE IS REASON TO BELIEVE THERE HAS BEEN A GRADUAL CHANGE IN THE REGION'S CLIMATE, AND THAT THE REDUCTION IN THE PRODUCTIVITY OF PASTURES IS DUE TO A DECREASE IN PRECIPITATION AND CHANGES IN ITS TEMPORAL DISTRIBUTION AND TO AN INCREASE IN TEMPERATURE AND EVAPORATION. A STATISTICAL ANALYSIS OF THE RECORDS FROM 25 PLUVIOMETRIC STATIONS SHOWED AN UPWARD LONG-TERM TREND FOR MOST OF THE STATIONS AND A DOWNWARD TREND FOR ONLY A FEW STATIONS GROUPED IN LIMITED AREAS. MARKED DIFFERENCES WERE FOUND IN THE SHORT TERM TRENDS OF PRECIPITATION. IT WAS CONCLUDED THAT DECREASE IN PASTURE LAND, INCREASED EROSION, AND OTHER RELATED PHENOMENA CANNOT BE ATTRIBUTED TO CLIMATIC CAUSES. AN ANALYSIS OF OVERGRAZING AND OF ITS CAUSES LEADS TO THE RECOMMENDATION THAT THE NUMBER OF SHEEP BE REDUCED BY 30 TO 49 PERCENT.

CHALS/PATAGONIAN DESERT/ARGENTINA/CLIMATIC CHANGE/GRAZING/CLIMATIC DATA/EROSION/LIVESTOCK/REGIONAL ANALYSIS/CLIMATIC-VEGETAL RELATIONSHIPS

17

IPUCHA AGUERRE, J.

1962

EVALUACION DE LA EROSION MANTIFORME (EVALUATION OF SHEET EROSION).

IDIA (BUENOS AIRES), SUPLEMENTO 10:102-

NOTE ON THE ABSENCE OF MODERATE SOIL EROSION IN ARGENTINA IF A LOSS OF 25 TO 75 PERCENT OF THE A HORIZON IS TAKEN AS A CRITERION FOLLOWING U.S.A. SOIL SCIENTISTS.

SHEET EROSION/SOIL EROSION

18

LUTI, R.

1967

ESTADO ACTUAL Y RECUPERACION NATURAL DE LA VEGETACION DE LAS ZONAS ARIDAS Y SEMIARIDAS (PRESENT STATE AND NATURAL RECOVERY OF VEGETATION IN THE ARID AND SEMIARID ZONES).

IDIA (BUENOS AIRES), SUPLEMENTO 19:64-

DESCRIBES ATTEMPTS TO IMPROVE THE NATURAL VEGETATION IN FIVE EXPERIMENTAL PLOTS IN RIO SECO, CRUZ DEL EJE AND POCHO.

VEGETATION/REVEGETATION/ARID LANDS

19

**HARLANGE, M.**

1973

**CONTRIBUTION A L'ETUDE PHYTO-ECOLOGIQUE DU CHACO ARGENTIN  
(CONTRIBUTION TO PHYTOECOLOGICAL STUDIES OF THE ARGENTINE CHACO).**

**CENTRE D'ETUDES PHYTOSOCIOLOGIQUES ET ECOLOGIQUES LOUIS EMBERGER,  
MONTPELLIER, DOCUMENT 58. 2 VOLS. VARIOUS PAGINGS.**

**GENERAL ECOLOGICAL FEATURES OF THE REGION ARE SUMMARIZED IN VOLUME 1. TEXT AND MAPS COVER TRANSECTS AND SAMPLING POINTS, GEOGRAPHY, SURFACE MATERIALS, GEOLOGY, ATMOSPHERIC PRESSURE AND TEMPERATURE, PRECIPITATION, EVAPORATION, CLIMATIC ZONES, GEOMORPHOLOGY, HYDROLOGY, SOILS, HUMAN POPULATIONS, LAND USE, AND PHYTOGEOGRAPHIC ZONES. IN VOLUME 2 CONCEPTS AND METHODS USED ARE OUTLINED, AND RESULTS ARE SUMMARIZED. DATA FROM RECONNAISSANCE AND QUANTITATIVE SAMPLING ARE PROCESSED BY STATISTICAL AND FACTOR ANALYSES. PLANT SPECIES ARE CLASSIFIED ACCORDING TO THEIR ECOLOGICAL FUNCTIONS. CERTAIN SPECIES AND GROUPS ARE ESPECIALLY GOOD INDICATORS OF PHYTOECOLOGICAL AND PHYTOGEOGRAPHICAL ZONES. BIBLIOGRAPHIES, DATA SUMMARIES, AND MANY TABLES AND FIGURES ARE INCLUDED. (OALS)**

**OALS/KWIC AE 6/MEIGS SB23/MEIGS AB23/ARGENTINA/MONTE/CORDOBA PROVINCE/  
JUJUY PROVINCE/LA RIOJA PROVINCE/SALTA PROVINCE/SANTIAGO DEL ESTERO/  
TRANSECTS/GEOLOGY/AIR TEMPERATURE/PRECIPITATION(ATMOSPHERIC)/MAPS/  
EVAPORATION/CLIMATIC ZONES/GEOMORPHOLOGY/HYDROLOGY/POPULATIONS/LAND  
USE/PHYTOGEOGRAPHY/DISTRIBUTION PATTERNS/ON-SITE DATA COLLECTIONS/  
QUANTITATIVE SAMPLING/ANALYTICAL TECHNIQUES/PLANT ECOLOGY/PLANT  
DISTRIBUTION/BIBLIOGRAPHIES/SURVEYS/CLIMATE/SEMIARID CLIMATE/REGIONAL  
GEOGRAPHY/PLANT INDICATORS/PLANT COMMUNITIES/ATMOSPHERIC PRESSURE/SOIL  
MAPS**

20

**HOLINA, J.S.**

1967

**LA RECONQUISTA DEL DESIERTO (THE RECONQUEST OF THE DESERT).**

**CIENCIA E INVESTIGACION (BUENOS AIRES) 23(11):494-501.**

**DESERTS/RECLAMATION**

21

**NOBELLO, J.**

1955 - 1956

**ESTUDIOS BOTANICOS EN LAS REGIONES ARIDAS DE LA ARGENTINA**

**REVISTA AGRONOMICA DEL NOROESTE ARGENTINO 1:301-370, 385-524;  
2:79-152.**

A STUDY OF THE ANATOMY OF TRANSPIRING ORGANS, HABITAT, MORPHOLOGY, AND VARIATION IN TRANSPIRING SURFACES OF 4 RESINOUS SPECIES OF THE MONTE, LARREA CUNEIFOLIA, LARREA DIVARICATA, LARREA NITIDA AND ZUCCAGNIA PUNCTATA. INCLUDES HABITAT PICTURES, A DISCUSSION OF XEROMORPHIC CHARACTERISTICS, AND A GOOD BIBLIOGRAPHY. NOTES THAT L. NITIDA WAS A PHREATOPHYTE AND THAT L. CUNEIFOLIA WAS FOUND IN THE DRIEST PLACES (CLIMATIC AND EDAPHIC). PART 3 DEALS WITH THE CONDITIONS OF SOIL MOVEMENTS (EROSION PHENOMENA), EROSION AND SEDIMENTATION IN NEUQUEN, NORTHWESTERN PATAGONIA. MANY METEOROLOGICAL DATA ARE ANALYZED AND THEN THE ROOT-SYSTEM AND ROOTING HABITS UNDER THE EFFECTS OF EROSION IN DIFFERENT SHRUBS OF THE DESERT.

ARID LANDS/ARGENTINA/MONTE/LARREA/XEROPHYTES/PLANT MORPHOLOGY/PLANT ECOLOGY/PLANT PHYSIOLOGY/ROOTS/EROSION/PATAGONIAN DESERT/MICROENVIRONMENT/OALS

22

MORRIS, A. S.

1969

THE DEVELOPMENT OF THE IRRIGATION ECONOMY OF MENDOZA, ARGENTINA.

ASSOCIATION OF AMERICAN GEOGRAPHERS, ANNUALS 59(1):97-115. SWRA W70-01213.

THE AGRICULTURAL PATTERN OF MENDOZA, ARGENTINA, HAS TWO MAIN ELEMENTS, AN EARLY-DEVELOPED REGION OF VINEYARDS AROUND MENDOZA CITY, AND A REGION TO WEST, SOUTH, AND EAST WITH MORE CROP DIVERSITY AND MODERN TECHNOLOGY. FOUR PRINCIPAL FACTORS CONTRIBUTE TO THE DIFFERENCE BETWEEN THESE TWO, 1) CLIMATE; 2) THE CHRONOLOGY OF AGRICULTURAL SETTLEMENT; 3) LAND TENURE; AND 4) THE MANNER OF WATER PROVISION. THE MENDOZA CITY REGION IS ASSOCIATED WITH HIGHER TEMPERATURES AND LONGER GROWING SEASON THAN THE PERIPHERAL REGION, WITH EARLIER DEVELOPMENT OF IRRIGATED LAND, WITH BACKWARD FORMS OF LAND TENURE, AND WITH ONLY LIMITED USE OF WELL WATER TO AID RIVER SUPPLIES. BOTH LAND TENURE AND WATER PROVISION ARE CHANGING FACTORS WITH CONSIDERABLE IMPACT ON THE RATE OF AGRICULTURAL DEVELOPMENT. THE PROBABLE QUALITATIVE EFFECT OF TWO FURTHER CHANGES IN WATER SUPPLY, HIGH DAMS, AND NEW WATER CONTROL LEGISLATION, IS COMPARABLE TO THAT OF WELL USE. BY CONTRAST, CANAL LINING AND RIVER DIVERSION ARE PRIMARILY QUANTITATIVE ADDITIONS WITH LITTLE DEVELOPMENTAL EFFECT.

LAND TENURE/IRRIGATION/MENDOZA PROVINCE/ARGENTINA/MONTE/ECONOMIC DEVELOPMENT/LAND USE/OALS

23

PARODI, L. R.

1938

PLANTAS PSAMOFILAS INDIGENAS, QUE PUEDEN SER CULTIVADAS PARA CONSOLIDAR DUNAS.

JORNADAS AGRONOMICAS Y VETERINARIAS (UNIVERSIDAD DE BUENOS AIRES). 13 P.

A DISCUSSION OF NATIVE PSAMMOPHYTES, MOSTLY TRAILING GRASSES AND HERBS, WHICH CAN BE USED FOR DUNE FIXATION, EVEN IN VERY DRY CLIMATES.

ARGENTINA/PATAGONIAN DESERT/MONTE/DUNES/SAND CONTROL/SAND DUNES/PSAMMOPHYTES/HERBS/GRASSES/LAND RECLAMATION/EROSION CONTROL/SOIL STABILIZATION/OALS

24

PERNAS, R.E.

1968

UNDERGROUND WATERS OF THE ARGENTINE REPUBLIC. IN INTERNATIONAL CONFERENCE ON WATER FOR PEACE, WASHINGTON, D.C. 1967.

WATER FOR PEACE 2:954-962. MGA 21.9-629.

FOR A DISCUSSION OF THE CHARACTERISTICS AND DISTRIBUTION OF GROUNDWATER, THE COUNTRY IS DIVIDED INTO HYDROGEOLOGICAL PROVINCES WITH ANALOGOUS GROUNDWATER CHARACTERISTICS. SOME OF THE REGIONS THAT SHOULD HAVE BEEN TREATED SEPARATELY ARE COMBINED WITH GEOLOGICALLY SIMILAR ONES IN ORDER NOT TO EXCEED THE SPACE ALLOTTED TO THIS PAPER. WITH THIS RESERVATION, SIX HYDROGEOLOGICAL PROVINCES ARE DESCRIBED: 1) THE PUNA, 2) INTERMOUNTAIN VALLEYS AND FOOTHILL REGIONS, 3) CHACO OF BUENOS AIRES OR OF THE PAMPA, 4) MESOPOTAMIA PROVINCE, 5) PATAGONIA OUTSIDE THE ANDES, AND 6) PATAGONIA WITHIN THE ANDES. FRENCH AND SPANISH SUMMARIES.

PATAGONIAN DESERT/HYDROLOGY/GROUNDWATER/ARGENTINA/MONTE/OALS

25

PREGO, A.J./TALLARICO, L.A.

1950

EXPERIMENTACION DE TECNICAS DE CONSERVACION DE LOS SUELOS Y DE LA HUMEDAD EN LA REGION SEMIARIDA ARGENTINA (EXPERIMENTS IN SOIL AND HUMIDITY CONSERVATION TECHNIQUES IN THE SEMIARID REGION OF ARGENTINA).

H.A.G./INTA, INSTITUTO DE SUELOS Y AGROTECNICA, BUENOS AIRES, TIRADA INTERNA 16. 22 P.

SOIL CONSERVATION/HUMIDITY/TECHNIQUES/SEMIARID CLIMATE

26

PREGO, A.J.

1962

LA EROSION EOLICA EN LA REPUBLICA ARGENTINA (EOLIC EROSION IN ARGENTINA).

INTA, INSTITUTO DE SUELOS Y AGROTECNICA, PUBLICACION 78. 17 P.

REFERS TO GENERAL PROBLEMS OF EROSION AND DESERTIFICATION IN ARGENTINA. WIND EROSION, ITS CAUSES AND EXTENSION AND PREVENTIVE MEASURES ARE DISCUSSED IN MORE DETAIL.

EOLIAN SOILS/SOIL EROSION/WIND EROSION/DESERTIFICATION

27

PREGO, A.J./RIAL ALBERTI, F./PROHASKA, F.J.

1964

FORESTACION DE MEDANOS EN LA REGION PANPEANA SEMIARIDA (DUNE AFFORESTATION IN THE SEMIARID PANPA).

IDIA (BUENOS AIRES), SUPLEMENTO FORESTAL 12:73-82.

AFFORESTATION/DUNES/PLAINS

28

PREGO, A.J. ET AL.

1966

ESTABILIZACION DE MEDANOS MEDIANTE FORESTACION EN LA REGION PANPEANA SEMIARIDA (DUNE STABILIZATION THROUGH AFFORESTATION IN THE SEMIARID PANPA).

INTA, INSTITUTO DE SUELOS Y AGROTECNICA, PUBLICACION 100. 17 P.

DESCRIBES DUNE FIXATION ATTEMPTS WITH PLANTATIONS OF POPULUS EUROAMERICANA AND DELTOIDES IN THE PARANA DELTA.

AFFORESTATION/DUNES/SOIL STABILIZATION/PLAINS/POPULUS

29

PREGO, A.J. ET AL

1971

STABILIZATION OF SAND DUNES IN THE SEMIARID ARGENTINE PAMPAS. IN W.G. MCGINNIES, B.J. GOLDMAN AND P. PAYLORE, EDS., FOOD, FIBER, AND THE ARID LANDS, P. 369-392.

UNIVERSITY OF ARIZONA PRESS, TUCSON. SWRA W72-03672.

APPROXIMATELY 75 PERCENT OF THE AREA OF ARGENTINA SUFFERS FROM ARIDITY, WHICH INTENSIFIES FROM EAST TO WEST. THE WORST PROBLEMS OF WIND EROSION AND SAND DUNE INSTABILITY OCCUR IN THE SEMIARID PAMPAS WHICH COMPRISES AN AREA OF ABOUT 22 MILLION HA. THIS REGION, BECAUSE OF GRAIN AND LIVESTOCK, IS ONE OF THE MOST IMPORTANT SOCIOECONOMIC REGIONS OF THE COUNTRY. RECORDS SHOW THAT THE IRREVERSIBLE DESTRUCTION OF FERTILE LANDS HAS BEEN EXTENSIVE AND SERIOUS, WITH SAND DUNES AS THE PERMANENT FOCI OF DESTRUCTION. AN ATTEMPT IS MADE TO DESCRIBE SYNTHETICALLY THE ENVIRONMENTAL CHARACTERISTICS, THE RESEARCH ACCOMPLISHED AND THE RESULTS ACHIEVED SINCE AN INTENSIVE RESEARCH EFFORT WAS BEGUN IN 1947. PASTURE ESTABLISHMENT IS MORE COMPLICATED THAN AFFORESTATION, BUT ACCOMPLISHES DUNE STABILIZATION IN ONLY 3-6 MONTHS WHILE TREES NEED 2-3 YEARS. (OALS)

OALS/ARGENTINA/SEMIARID CLIMATE/SAND CONTROL/EROSION CONTROL/SAND DUNES/SANDS/WIND ACTION/VEGETATION ESTABLISHMENT/GRASSES/AFFORESTATION/REFORESTATION/SEEDING/SALIX/ULMACEAE/EUCALYPTUS/DUNES

30

PROHASKA, F.J.

1960

EL PROBLEMA DE LAS SEQUIAS EN LA REGION SEMIARIDA PANPEANA Y LA SEQUIA ACTUAL (THE DROUGHT PROBLEM IN THE SEMIARID PAMPA REGION AND THE PRESENT DROUGHT).

IDIA (BUENOS AIRES) 155:53:67.

PART OF ARGENTINA'S PAMPA CAN BE CLASSIFIED AS SEMIARID ALTHOUGH MEAN ANNUAL RAINFALL EXCEEDS 500 MM. YEARS WITH RAINFALL DEFICIENCIES OCCUR OVER 50 PERCENT OF THE RECORDED DATA AND DRY SPELLS DURING CRITICAL MONTHS FOR AGRICULTURE ARE ALSO FREQUENT. PRESENTS MAPS OF PRECIPITATIONS, EVAPOTRANSPIRATION (POTENTIAL) AND WATER DEFICIT. THE 1960 DROUGHT IS EXPLAINED BY A DISTURBANCE IN THE CIRCULATION PATTERN, AN ANOMALY IN THE ACTIVITY OF THE SW-ATLANTIC ANTICYCLONE.

DROUGHTS/RAINFALL/WEATHER DATA/PRECIPITATION DEFICIT/EVAPOTRANSPIRATION/ATMOSPHERIC CIRCULATION/ANTICYCLONES/PLAINS

31

PROHASKA, F.J.

1962

PERIODICIDAD DE LA SEQUIA EN LA REGION PANPEANA SEMIARIDA (PERIODICITY OF DROUGHT IN THE SEMIARID PAMPA REGION).

IDIA (BUENOS AIRES) 172:25-

ANALYSIS OF RAINFALL OVER 60 YEARS IN THE PAMPA REGIONS POINTS TO THE IMPORTANCE AND RELIABILITY OF SUMMER RAINFALL WHICH ACCOUNTS FOR 75 PERCENT OF ANNUAL TOTALS. ALTHOUGH PRECIPITATIONS ARE IRREGULAR, NO DEFINITE TREND CAN BE ESTABLISHED.

PLAINS/RAINFALL/RAINFALL RELIABILITY/SUMMER PRECIPITATION/WEATHER DATA

32

PROHASKA, F.J.

1964

LAS CARACTERISTICAS DE LAS PRECIPITACIONES EN LA REGION SEMIARIDA PANPEANA (PRECIPITATION CHARACTERISTICS OF THE SEMIARID PAMPA REGION).

REVISTA DE INVESTIGACIONES AGRICOLAS (BUENOS AIRES) 15 (2) : 179-232.

ANALYSIS OF PRECIPITATION REGIMES IN THE CENTER OF THE SEMIARID PAMPA BASED ON DATA FROM VICTORICA. SUMMER RAINFALL ACCOUNTS FOR 74 PERCENT OF ANNUAL TOTALS (FROM OCTOBER TO MARCH). ANNUAL VARIABILITY IS CONSIDERABLE AND WITH THE MEAN CLOSE TO THE LIMIT BETWEEN SEMIARID AND SUBHUMID CONDITIONS ABOUT 50 PERCENT OF ALL YEARS ARE AFFECTED BY DROUGHT IN VARYING DEGREES. DATA EXTENDING OVER A PERIOD OF 55 YEARS DO NOT POINT TO A DEFINITE TREND. HOWEVER, PERIODS OF ABOVE AND BELOW AVERAGE RAINFALL OVER SEVERAL SUCCESSIVE YEARS HAVE OCCURRED. FREQUENTLY, RAINFALL IS MAINLY DUE TO FRONTAL PASSAGES WHILE CONVECTIVE PROCESSES APPEAR OF MINOR IMPORTANCE.

PRECIPITATION (ATMOSPHERIC)/PLAINS/SEMIARID CLIMATE/DROUGHTS/WEATHER DATA/  
SUMMER PRECIPITATION/FROSTS (METEOROLOGY)

33

QUEVEDO, C. V.

1950

RECONOCIMIENTO DE LA EROSION DE LOS SUELOS EN LA REPUBLICA ARGENTINA  
(EROSION SURVEY OF SOILS IN ARGENTINA).

M.A.G./INTA, INSTITUTO DE SUELOS Y AGROTECNICA, TIRADA INTERNA 15. 10 P.

SOIL EROSION/SURVEYS

34

SAUBERAN, C. ET AL

1962

UTILIZACION DE METODOS BIOLOGICOS EN LA RECUPERACION DE SUELOS SALITROSOS  
EN REGIONES DE SECANO (UTILIZATION OF BIOLOGICAL METHODS FOR IMPROVEMENT  
OF NITRATE SOILS IN NON-IRRIGATED AREAS).

IDIA (BUENOS AIRES) 171:54-56.

NITRATE SOILS IS A NAME USED IN ARGENTINA TO DESIGNATE SOILS THAT HAVE  
BEEN AFFECTED BY SALT ACCUMULATIONS OF DIFFERENT TYPES AND DEGREES. AN  
ATTEMPT TO RECOVER SUCH SOILS IS BEING TRIED OUT ON A 500 HECTARE AREA:  
A PLANT WITH CELLULOSE CONTENT (SORGHUM TECHNICUM) IS SOWN. CATTLE ARE  
GRAZED ON THIS PLANT. MANURE, TOGETHER WITH PART OF THE VEGETATION THAT  
IS PLOWED UNDER, HELPS TO IMPROVE THE SOIL. IN A SECOND STAGE OF THE  
EXPERIMENT, OTHER FORAGE PLANTS ARE SOWN TO COMPLETE THE PROCESS.

SOIL SALINITY/SOIL AMENDMENTS/LAND RECLAMATION/FORAGE PLANTS/FERTILIZERS/  
ORGANIC MATTER

35

SORIANO, A.

1953

LA REGENERACION DE LA VEGETACION EN ZONAS ARIDAS (REGENERATION OF  
VEGETATION IN ARID REGIONS).

IDIA (BUENOS AIRES) 68.

VEGETATION/REVEGETATION/ARID LANDS

36

SORIANO, A.

1956

ASPECTOS ECOLOGICOS Y PASTORILES DE LA VEGETACION PATAGONICA RELACIONADOS CON SU ESTADO Y CAPACIDAD DE RECUPERACION (ECOLOGICAL AND PASTORAL ASPECTS OF THE PATAGONIAN VEGETATION IN RELATION TO THEIR STATE AND CAPACITY OF RECUPERATION).

REVISTA DE INVESTIGACIONES AGRICOLAS (BUENOS AIRES) 10 (4) :349-372.

DESCRIBES THE ECOLOGICAL CHARACTERISTICS OF FLORISTIC DISTRICTS IN PATAGONIA, IN PARTICULAR WITH RESPECT TO THEIR PASTORAL IMPORTANCE AND CAPACITY.

PATAGONIAN DESERT/VEGETATION/REVEGETATION/PASTURES

37

TALLARICO, L.A. ET AL

1956

MAPA DE EROSION DE LOS SUELOS DE LA REGION PAMPEANA 2. CONTRIBUCION:PARTIDO DE VILLARINO (EROSION MAP OF SOILS IN THE PAMPA REGION. 2: VILLARINO COUNTY).

IDIA (BUENOS AIRES) 99:5-12.

SHOWS DIFFERENT DEGREES OF WIND EROSION IN THE VILLARINO COUNTY.

SOIL EROSION/TOPOGRAPHIC MAPS/PLAINS/WIND EROSION

38

TRICART, J.

1969 - 1970

ACTIONS EOLIENNES DANS LA PAMPA DEPRIMIDA (REP. ARGENTINE)

REVUE DE GEOMORPHOLOGIE DYNAMIQUE 19(4) :178-189.

DESCRIPTION DES CHAMPS DE DUNES, DES CUVETTES DE DEFLATION, DES ACCUMULATIONS LIMONEUSES EOLIENNES MISES EN PLACE, SOUS CLIMAT ARIDE, PAR DES VENTS DE WSW A SW LORS DES DEUX DERNIERES REGRESSIONS GLACIO-EUSTATIQUES. CARTES ET SCHEMAS.

PLAINS/WIND ACTION/DUNES/EOLIAN SOILS/BASINS/GEOMORPHOLOGY

39

TRICART, J.

1970

OSCILLATIONS DU NIVEAU MARIN ET CHANGEMENTS CLIMATIQUES DANS LA PAMPA DEPRIMIDA (PAMPA ARGENTINE).

ASSOCIATION FRANCAIS POUR L'ETUDE DU QUATERNAIRE, BULLETIN 6(4) :243-268.

DES PERIODES ARIDES COINCIDENT AVEC LES DEUX DERNIERES REGRESSIONS GLACIO-EUSTATIQUES. ELLES ONT PROVOQUE LE CREUSEMENT DE CUVETTES DE DEFLATION EN DESSOUS DU NIVEAU MARIN ACTUEL, DANS UNE REGION OU ON NE SE MANIFESTE AUCUNE SUBSIDENCE RECENTE. MISE EN PLACE DE SYSTEMES DE DUNES, DE LIMONS EOLIENS LORS DES PERIODES ARIDES: CARACTERISTIQUES, EXTENSION.

PLAINS/CLIMATIC CHANGE/WATER LEVEL/FLUCTUATIONS/PALEOCLIMATOLOGY/BASINS/  
DUNES/CLIMATIC GEOMORPHOLOGY

40

TRICART, J.

1972

INFLUENCE DE LA GEOMORPHOLOGIE SUR LES SOLS DE LA PAMPA DEPRIMIDA (ARGENTINE).

OFFICE DE LA RECHERCHE SCIENTIFIQUE ET TECHNIQUE OUTRE-MER, PARIS, CAHIERS,  
SERIE PEDOLOGIE 2:153-168.

INFLUENCE DES MATERIAUX ET DES PROCESSUS DES PERIODES SECHES QUATERNAIRES  
SUR L'ALCALINISATION DES SOLS. CETTE DERNIERE EST HERITEE ET NE SE MAINTIENT,  
SOUS LE CLIMAT HUMIDE ACTUEL QUE PAR SUITE DE L'INSUFFISANCE DU DRAINAGE,  
CONSEQUENCE DE L'EVOLUTION GEOMORPHOLOGIE QUI A ENGENDRE UN RELIEF D'UNE  
EXTRAORDINAIRE PLATITUDE. RELATIONS ENTRE LES UNITES GEOMORPHOLOGIQUES ET LES  
TYPES DE SOLS.

PLAINS/SOIL TYPES/GEOMORPHOLOGY/ALKALINITY

41

TRICART, J./DOLLFUS, O./CLOOTS-HIRSCH, A.R.

1969

LES ETUDES FRANCAISES SUR LE QUATERNAIRE SUD-AMERICAIN. 'ETUDES FRANCAISES  
SUR LE QUATERNAIRE'.

ASSOCIATION FRANCAISE POUR L'ETUDE DU QUATERNAIRE, BULLETTIN [1969],  
SUPPLEMENT, P. 215-234.

FAIBLES MODIFICATIONS DE L'EXTENSION DES REGIONS ARIDES DU LITTORAL PACIFIQUE,  
DONT LES CARACTERES N'ONT PAS CHANGE DEPUIS LE QUATERNAIRE MOYEN. EXISTENCE  
DE PHASES ARIDES DANS LA PAMPA AU SUD DE BUENOS AIRES SIMULTANES AVEC LES  
DEUX DERNIERES GLACIATIONS DES ANDES PATAGONIENNES, AVEC FORTES MANIFESTATIONS  
EOLIENNES MODELEES PAR DES VENTS DU SW ET DE L'WSW.

QUATERNARY PERIOD/BEACHES/PLAINS/PALEOCLIMATOLOGY/WIND ACTION

42

TUYA, O.H./D'ANDREA, P.N.

1972

BIBLIOGRAFIA SOBRE ZONAS ARIDAS Y SEMIARIDAS DE LA REPUBLICA  
ARGENTINA (BIBLIOGRAPHY ON ARID AND SEMIARID ZONES OF THE ARGENTINE  
REPUBLIC).

MINISTERIO DE AGRICULTURA Y GANADERIA, INSTITUTO NACIONAL DE  
TECNOLOGIA AGROPECUARIA, ESTACION EXPERIMENTAL REGIONAL AGROPECUARIA  
ANGUIL, BIBLIOTECA, ANGUIL, LA PANPA. SERIE BIBLIOGRAFICAS 2. 16 P.

INCLUDES MORE THAN 300 REFERENCES ON INVESTIGATIONS ON SOIL  
CONSERVATION AND WATER UTILIZATION IN AGRICULTURAL PROGRAMS.  
AGRICULTURAL PRACTICES IN ARID AND SEMIARID REGIONS ARE EMPHASIZED IN  
THIS LIST AND A REVIEW OF CURRENT PROGRAMS TO LIMIT EROSION IS MADE.  
AUTHORS ARE LISTED ALPHABETICALLY WITH A SUBJECT INDEX PLACED AT THE  
END. THIS COMPILATION INCLUDES BOOKS, BULLETINS, PAMPHLETS, MAGAZINE  
ARTICLES AND ANNUAL REPORTS.

SOILS/BIBLIOGRAPHIES/ARID LANDS/ARID CLIMATE/SEMIARID CLIMATE/  
ARGENTINA/SOIL CONSERVATION/EROSION CONTROL/EVALUATION/SURVEYS/KWIC AB 1

43

SAPPANELLA, H.J.

1951

RELACIONES ENTRE LLUVIA, MATERIA ORGANICA Y EROSION EOLICA EN EL SUELO  
PAMPEANO (LINKS BETWEEN RAINFALL, ORGANIC MATTER AND WIND EROSION ON THE  
PAMPA SOILS).

IDIA (BUENOS AIRES) 37-39:37-40.

ATTEMPT TO DETERMINE THE DEGREE OF STABILITY OF PAMPA SOILS UNDER PREVAILING  
RAINFALL REGIME AND ORGANIC MATTER.

RAINFALL/WIND EROSION/ORGANIC MATTER/PLAINS/SOIL TYPES/SOIL STABILITY

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SOUTH AMERICA

Brazil



## BRAZIL

1

ALDAZ, L.

1971

CARACTERIZACAO PARCIAL DO REGIME DE CHUVAS DO BRASIL (PARTIAL CHARACTERIZATION OF BRAZIL'S RAINFALL REGIME).

BRAZIL, DEPARTAMENTO NACIONAL DE METEOROLOGIA, RIO DE JANEIRO, CENTRO DE ESTUDOS METEOROLOGICOS, SUPERINTENDENCIA DO DESENVOLVIMENTO DO NORDESTE. 42 P.

PRESENTS YEARLY PRECIPITATION ANOMALIES FROM 1914 TO 1960 INCLUSIVE. PARTICULAR ATTENTION IS GIVEN TO MAIN TYPES OF YEARLY RAINFALL DISTRIBUTION, TRIADS OF RAINIEST AND DRIEST MONTHS AND THE RAINFALL RATES OF CHANGE FOR SUCCESSIVE MONTHS IN UNITS OF 5MM/MONTH. TEN CATEGORIES OF YEARLY RAINFALL ANOMALIES, EACH EXEMPLIFIED BY A PARTICULAR YEAR IN THE SERIES, ARE GIVEN. TOPOGRAPHIC AND OCEANIC INFLUENCES ARE ANALYZED IN RELATION TO RAINFALL DISTRIBUTION. PERIODS OF DROUGHT IN NORTHEASTERN BRAZIL ARE ANALYZED IN RELATION TO TYPE OF RAINFALL DISTRIBUTION FOR THE ENTIRE COUNTRY AND SOME HYPOTHESES ARE OUTLINED FOR A LINK WITH THE REGIONAL CIRCULATION.

RAINFALL/WEATHER PATTERNS/WET SEASONS/DRY SEASONS/OCEANOGRAPHY/TOPOGRAPHY/DROUGHTS/ATMOSPHERIC CIRCULATION/CLIMATIC DATA

2

BRAZIL, DEPARTAMENTO DE RECURSOS NATURAIS, RECIFE, SUPERINTENDENCIA DO DESENVOLVIMENTO DO NORDESTE

1973

CATALOGO DAS PUBLICACOES EDITADAS PELO DRN (CATALOGUE OF PUBLICATIONS EDITED BY DRN).

SAME AS AUTHOR. 83 P.

CATALOGUE OF PERIODICAL, NON-PERIODICAL AND CARTOGRAPHIC PUBLICATIONS BY THE FOLLOWING DEPARTMENTS: AGROLOGY, ECONOMIC BOTANY, CARTOGRAPHY, GEOLOGY, HYDROGEOLOGY, HYDROLOGY, PROGRAMMING AND CONTROL, FISHERY RESOURCES, INTEGRATED STUDIES AND IRRIGATION, METEOROLOGY. 490 PUBLICATIONS AND 145 MAPS ARE LISTED WITH PRICES.

AGRONOMY/ECONOMIC PLANTS/MAPS/GEOLOGY/HYDROLOGY/HYDROGEOLOGY/FISH/IRRIGATION/METEOROLOGY

3

BRAZIL, MINISTERIO DA AGRICULTURA, RIO DE JANEIRO, ESCRITORIO DE METEOROLOGIA, SUPERINTENDENCIA DO DESENVOLVIMENTO DO NORDESTE

1969

CONTRIBUÇAO AO ESTUDO DA CLIMATLOGIA DO NORDESTE (CONTRIBUTION TO THE STUDY OF THE CLIMATOLOGY OF THE NORTHEAST).

SAME AS AUTHOR. 22 P.

GENERAL CLIMATIC CHARACTERISTICS OF THE NORTHEAST BASED ON DATA FROM 82 CLIMATIC STATIONS IN THE AREA.

CLIMATOLOGY/CLIMATIC DATA/RAINFALL STATIONS

4

CAVIEDES, C.

1973

SECAS AND EL NINO: TWO SIMULTANEOUS CLIMATICAL HAZARDS IN SOUTH AMERICA.

ASSOCIATION OF AMERICAN GEOGRAPHERS, PROCEEDINGS 5:44-49.

AMONG THE MOST DISASTROUS CLIMATIC HAZARDS AFFECTING BOTH MAN AND THE ECOLOGY OF PLANTS AND ANIMALS IN SOUTH AMERICA ARE THE EL NINO PHENOMENON OF NORTHWESTERN PERU AND THE SECAS OF NORTHEASTERN BRAZIL. SIMULTANEOUS APPEARANCE OF BOTH PHENOMENA IN SOME PARTICULAR YEARS POINTS TO THE POSSIBILITY OF A LINKAGE BETWEEN THEM. IN THEIR ORIGIN, EL NINO AND THE SECAS DEPEND ON THE POSITION OF THE INTERTROPICAL CONVERGENCE (ITC) AND THE SUBTROPICAL HIGH PRESSURE CELLS OF THE SOUTH PACIFIC AND SOUTH ATLANTIC OCEANS. UNUSUAL POLEWARD ADVANCE OF THE ITC DURING EL NINO YEARS ON THE PERUVIAN COAST APPEARS TO BE COUNTER-BALANCED BY AN EQUATORIALWARD MOVEMENT OF BOTH ITC AND ANTICYCLONE ON THE ATLANTIC SIDE. THE STATIONARY CHARACTER OF THIS HIGH PRESSURE CELL ACCOUNTS FOR A DRY SUMMER OVER NE-BRAZIL WHICH TOGETHER WITH THE NORMALLY DRY WINTERS IN THE REGION CREATE A DROUGHT PERIOD. NEPHANALYSIS OF SATELLITE PICTURES OF NORMAL YEARS SUGGESTS THAT THIS MECHANISM IS THE REASON FOR THE SIMULTANEOUS OCCURRENCE OF THE TWO EVENTS.

PERU/NINO/CLIMATE/CLIMATOLOGY/OCEANOGRAPHY/ATMOSPHERIC PRESSURE/DROUGHTS/ANTICYCLONES/METEOROLOGICAL DATA/DRY SEASONS/SPACEBORNE PHOTOGRAPHY

5

CORREIA DE ANDRADE, M.

1973

A TERRA E O HOMEM NO NORDESTE (LAND AND MAN IN THE NORTHEAST).

EDITORA BRASILIENSE, SAO PAULO, BRAZIL. 249 P.

THE DROUGHT POLYGON - 'POLIGONO DAS SECAS' - IN NORTHEASTERN BRAZIL LIES WITHIN REGIONS WITH MORE HUMID CHARACTERISTICS. THE PATTERN OF HUMAN OCCUPANCY AND ECONOMIC ACTIVITIES IS EXAMINED AGAINST THE VARIED PHYSICAL BACKGROUND. IN PARTICULAR, LAND TENURE AND LAND USE - RURAL WORK FORCE RELATIONSHIPS ARE ANALYZED IN DIFFERENT PARTS OF THE BRAZILIAN NORTHEAST, BOTH IN THEIR HISTORICAL EVOLUTION AND PRESENT ASPECTS.

SETTLEMENTS/ECONOMIC DEVELOPMENT/LAND TENURE/PHYSICAL GEOGRAPHY/LAND USE/  
SOCIAL ASPECTS/HISTORY

6

DEAN, G.A.

1971

THE THREE-DIMENSIONAL WIND STRUCTURE OVER SOUTH AMERICA AND ASSOCIATED  
RAINFALL OVER BRAZIL.

FLORIDA STATE UNIVERSITY, DEPARTMENT OF METEOROLOGY, REPORT LAFE-164/  
CONSELHO NACIONAL DE PESQUISAS, INSTITUTO DE PESQUISAS ESPACIAIS,  
SAO JOSE DOS CAMPOS, SP, BRAZIL. 33 P.

IMPROVED RAWINSONDE NETWORK IN SOUTH AMERICA PERMITTED ANALYSIS OF UPPER-  
LEVEL WIND STRUCTURE FOR THE PERIOD JANUARY 1969 TO FEBRUARY 1970. THE  
DYNAMICS OF CLIMATE IN NORTHEASTERN BRAZIL AND IRREGULARITIES OF PRECIPITATION  
APPEAR TO BE LINKED TO 1) INTENSITY OF UPPER-LEVEL MONSOON TENDENCY OVER  
BOLIVIA, 2) STRENGTH OF ASIAN MONSOON IN THE NORTHERN HEMISPHERE, AND 3)  
STRENGTH OF 'WALKER' CIRCULATION OVER THE SOUTH ATLANTIC OCEAN. THE VARIABILITY  
OF RAINFALL IN NORTHEASTERN BRAZIL COULD BE RELATED TO THE VARIABILITY IN THE  
ONSET OF THE ASIAN MONSOON.

RAINFALL/CLIMATOLOGY/MONSOONS/WEATHER PATTERNS/ATMOSPHERIC CIRCULATION

7

FREISE, F.J.

1938

THE DROUGHT REGION OF NORTHEASTERN BRAZIL.

GEOGRAPHICAL REVIEW 28:363-378.

DROUGHTS

8

GHOSE, S.K./POULTNEY, R.G.

1971

CRITERIO PRATICO PARA ESTIMATIVA DAS CONDIÇÕES DE SECA NO NORDESTE BRASILEIRO  
(AN APPLIED CRITERION FOR ESTIMATING DROUGHT CONDITIONS IN NORTHEASTERN BRAZIL  
(BILINGUAL)).

BRAZIL, GRUPO EXECUTIVO MISTO DE METEOROLOGIA, RECIFE, SUPERINTENDENCIA DO  
DESENVOLVIMENTO DO NORDESTE. 41 P.

FOR THE PURPOSE OF DROUGHT ASSESSMENT, THE DROUGHT POLYGON IN NORTHEASTERN BRAZIL WAS DIVIDED INTO FOUR REGIONS ACCORDING TO THE PERIOD OF RAINFALL. AN APPROACH TO ESTIMATION OF DROUGHT SEVERITY WAS CARRIED OUT BY COMBINING DATA ON TYPES OF CROPS GROWN IN DIFFERENT PARTS, CONSUMPTIVE WATER USE OF SELECTED CROPS DURING DIFFERENT PERIODS OF GROWTH, AVERAGE RAINFALL, EVAPORATION (PAN A) OVER TEN-DAY PERIODS. THE RESULTS POINT TO SPATIAL VARIATIONS IN DROUGHT IMPACT IN THIS AREA AND TO THE NECESSITY TO TREAT INDIVIDUALLY EACH CROP IN EACH RAINFALL ZONE.

DROUGHTS/CROP RESPONSE/RAINFALL/EVAPORATION/CLIMATIC ZONES

9

MARKHAM, C.G.

1974

APPARENT PERIODICITIES IN RAINFALL AT FORTALEZA, CEARA, BRAZIL.

JOURNAL OF APPLIED METEOROLOGY 13:176-179.

ANALYSIS OF LONG-TERM PLUVIOMETRIC RECORDS AT FORTALEZA FROM 1849-1971 SHOW THE EXISTENCE OF 13-YEAR PERIODS BETWEEN MAXIMUM AND MINIMUM PRECIPITATIONS. MAJOR MAXIMA (AND MINIMA) APPEAR TO OCCUR EVERY 26 YEARS. A POSSIBLE EXPLANATION WOULD BE QUASI-PERIODIC CHANGES IN THE MEAN DIRECTION OF TROPOSPHERIC FLOW DURING THE RAINY SEASON.

RAINFALL/CLIMATIC DATA/WEATHER PATTERNS/ATMOSPHERIC CIRCULATION

10

MARKHAM, C.G.

1975

TWENTY-SIX YEAR CYCLICAL DISTRIBUTION OF DROUGHT AND FLOOD IN CEARA, BRAZIL.

PROFESSIONAL GEOGRAPHER 27(4):454-456.

BASED ON LONG DATA SERIES FROM THREE STATIONS IN CEARA STATE, BRAZIL, DROUGHT AND FLOODS APPEAR WITH A CYCLE OF 26 YEARS; A SECONDARY MAXIMUM IS ABOUT 180 DEGREES OUT OF PHASE. POSSIBLE CAUSE FOR THE PHENOMENON COULD BE A LONG-TERM RESONANCE IN THE OCEAN-ATMOSPHERE SYSTEM. AUTHOR PROPOSES FURTHER RESEARCH INTO SEA TEMPERATURE - FLOOD AND DROUGHT RELATIONSHIPS.

FLOODS/DROUGHTS/CLIMATIC DATA/WEATHER PATTERNS/ATMOSPHERIC CIRCULATION/  
OCEANOGRAPHY/WATER TEMPERATURE

11

NAMIAS, J.

1972

INFLUENCE OF NORTHERN HEMISPHERE GENERAL CIRCULATION ON DROUGHT IN NORTHEASTERN BRAZIL.

TELLUS 24(4):336-342.

DROUGHT IN NORTHEASTERN BRAZIL COULD BE ASSOCIATED WITH LARGE-SCALE FEATURES OF THE GENERAL CIRCULATION IN THE NORTHERN HEMISPHERE MORE THAN 8000 KM AWAY. STRONG SUBTROPICAL ANTICYCLONES AND POLEWARD DISPLACEMENT OF THE UPPER-LEVEL WESTERLIES OVER EASTERN NORTH AMERICA AND ATLANTIC OCEAN APPEAR TO BE LINKED TO BANDS OF ABOVE- AND BELOW-NORMAL PRECIPITATION IN CENTRAL AND SOUTH AMERICA. STRONG NE TRADE WINDS WOULD ENHANCE RISING MOTION IN THE INTERTROPICAL CONVERGENCE ZONE AND POSSIBLY DISPLACE IT SOUTHWARD. A STRENGTHENING OF THE SOUTHEASTERLY TRADE WINDS WOULD RESULT FROM THE FORMER AND AN ADDITIONAL GREATER INFLUX OF MOIST AIR FROM THE SW ATLANTIC OCEAN TO NE BRAZIL. CONVERSELY, WEAKER NE TRADE WINDS WOULD RESULT IN RAINFALL DEFICIENCY IN THE SAME AREA.

DROUGHTS/ATMOSPHERIC CIRCULATION/ANTICYCLONES/PRECIPITATION(ATMOSPHERIC)/  
TRADE WINDS/PRECIPITATION DEFICIT

12

PIOGER, R.

1968

RESSOURCES EN EAU DE NORD-EST DU BRESIL. LES EAUX FLUVIALES: HYDROLOGIE ET GEOMETRIE COMPAREES DES RESERVOIRS ET POLITIQUE DE L'EAU DU NORD-EST DU BRESIL (WATER RESOURCES OF NORTHEASTERN BRAZIL. FLUVIAL WATERS: HYDROLOGY AND COMPARATIVE GEOMETRY OF RESERVOIRS AND WATER POLICY IN NORTHEASTERN BRAZIL).

BRAZIL, SUPERINTENDENCIA DO DESENVOLVIMENTO DO NORDESTE, RECIFE/FAO.  
(UNPUBLISHED)

WATER RESOURCES/WATER ALLOCATION(POLICY)/RESERVOIRS/WATER SOURCES/HYDROLOGY

13

REBOUCAS, A.C.

1972

HIDROLOGIA DAS SECAS, NORDESTE DO BRASIL (HYDROLOGY OF THE DROUGHTS, NORTHEASTERN BRAZIL).

BRAZIL, DIVISAO DE HIDROGEOLOGIA, RECIFE, SUPERINTENDENCIA DO DESENVOLVIMENTO DO NORDESTE. 126 P.

DROUGHTS/HYDROLOGY

14

SILVA FILHO, E.H. DA

1970

UMA ABORDAGEM PROBABILISTICA A PLUVIOMETRIA DO NORDESTE DO BRASIL (A  
PROBABILISTIC APPROACH TO THE PLUVIOMETRY OF NE-BRAZIL).

BRAZIL, DEPARTAMENTO DE TRANSPORTES, RECIFE, SUPERINTENDENCIA DO  
DESENVOLVIMENTO DO NORDESTE 12-13.

RAINFALL/CLIMATOLOGY/PROBABILITY

15

WAGEMANN, H.

1970

RESULTADO DAS MEDICOES METEOROLOGICAS NO POLIGONO DAS SECAS NO NORDESTE  
BRASILEIRO NOS ANOS 1968 E 1969 (RESULTS OF METEOROLOGICAL MEASUREMENTS IN  
THE DROUGHT POLYGON OF THE NORTHEAST OF BRAZIL DURING THE YEARS 1968 AND 1969).

BRAZIL, DIVISAO DE HIDROLOGIA, RECIFE, SUPERINTENDENCIA DO DESENVOLVIMENTO  
DO NORDESTE. 25 P.

DROUGHTS/METEOROLOGICAL DATA



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SOUTH AMERICA

Chile



## CHILE

1

ANONYMOUS

1967

ANTECEDENTES AGROPECUARIOS DE LA HOYA DEL RIO ELQUI, ANTECEDENTES AGROPECUARIOS DE LA HOYA DEL RIO HUASCO (AGRICULTURAL AND LIVESTOCK ANTECEDENTS OF THE ELQUI AND HUASCO RIVER BASINS).

INSTITUTO DE INVESTIGACIONES DE RECURSOS NATURALES/CORFO, SANTIAGO 37.  
37 P.

RIVER BASINS/AGRICULTURE/LIVESTOCK

2

ANTONIOLETTI, P. ET AL

1972

CARACTERISTICAS CLIMATICAS DEL NORTE CHICO (CLIMATIC CHARACTERISTICS OF THE NORTE CHICO), CHILE).

INSTITUTO DE INVESTIGACION DE RECURSOS NATURALES IREN/CORFO, PUBLICATION 6.  
102 P.

THE SEVERE DROUGHT IN 1968 RENEWED INTEREST IN CLIMATIC STUDIES OF CHILE'S SEMIARID NORTE CHICO REGION AND POINTED TO THE NEED FOR RESEARCH IN THE AREA OF DROUGHT PREVENTION. THE FIRST CHAPTER CONTAINS A CLASSIFICATION OF REGIONAL CLIMATIC TYPES USING THE KOEPPEN SYSTEM. THE SECOND CHAPTER DEALS WITH THE PRECIPITATIONS, STARTING WITH THE LINK BETWEEN THE REGIONAL CIRCULATION, DOMINANT WEATHER TYPES AND PRECIPITATION. A FREQUENTIAL ANALYSIS OF MONTHLY AND ANNUAL PRECIPITATION TOTALS IS PRESENTED, TOGETHER WITH THE DURATION OF RAINLESS DAYS IN WINTER. A STUDY OF TEMPERATURES AND THERMAL REGIMES CONCLUDES THE BOOK. THE EFFECTS OF SUBSIDENCE ON THE EASTERN MARGIN OF THE ANTICYCLOPE AND THE COLD WATERS OF THE PACIFIC OCEAN CONTRIBUTE TO A QUASI-PERMANENT INVERSION AND A NEGATIVE THERMAL ANOMALY WITH RESPECT TO LATITUDE. SEVERAL TEMPERATURE PROFILES FROM SOUNDINGS AND SURFACE MEASUREMENTS ARE GIVEN. THE THERMAL CHARACTERISTICS FOR THE DIFFERENT CLIMATIC REGIONS ARE ANALYZED TOGETHER WITH THE BIOLOGICALLY IMPORTANT FREQUENCIES OF MINIMA AND MAXIMA. A COMPLETE SET OF MAPS SHOWING CLIMATIC REGIONS, AREAL DISTRIBUTION OF CLIMATIC PARAMETERS, INCLUDING FREQUENTIAL DATA, ACCOMPANIES THIS WORK.

DROUGHTS/CLIMATIC DATA/SEMIARID CLIMATE/MAPS/KOEPPENS CLIMATIC CLASSIFICATION/  
CLIMATE/PRECIPITATION(ATMOSPHERIC)/TEMPERATURE

3

ARANDA, X.

1964

SAN PEDRO DE ATACAMA: ELEMENTOS PARA UN PLAN DE DESARROLLO LOCAL  
(ELEMENTS FOR A LOCAL DEVELOPMENT PLAN IN SAN PEDRO DE ATACAMA).

INFORMACIONES GEOGRAFICA (SANTIAGO) 11-14:19-61.

SUMMARIZES AN EARLIER STUDY ON LAND-TENURE AND LAND-USE IN THE SAN PEDRO DE ATACAMA AREA. WATER IS OBTAINED FROM SPORADIC RIVER FLOW; RAINFALL OCCURS ONLY IN SOME YEARS. THE EXISTING IRRIGATION NETWORK IS DEFECTIVE AND DOES NOT FOLLOW CONTOURS CAUSING A LACK OF WATER IN SOME PADDocks AND EXCESS IN OTHERS. A FEW ARTESIAN WELLS SUPPLEMENT WATER SUPPLY FROM RIVERS. POPULATION IS SMALL (819 INHABITANTS IN 1960), AN EXCESSIVE PROPORTION IN THE 40-60 YEAR BRACKET AND TOO FEW CHILDREN AND YOUTHS. EMIGRATION HAS AFFECTED PEOPLE MAINLY BETWEEN 20-50 YEARS OF AGE WHO FIND IT DIFFICULT TO SUBSIST IN SAN PEDRO. OF A TOTAL 1035 RURAL PROPERTIES, NEARLY 60 PERCENT COVER 1 HECTARE OR LESS AND ONLY 5 PERCENT MORE THAN 5. FACTORS IN THIS EXTREME SUBDIVISION: EQUAL PARTITION AMONG INHERITORS, AND DECAY OF INDIGENOUS COMMUNITIES. FRAGMENTATION IS COMMON, E.G. ABOUT ONE-THIRD OF OWNERS HAVE 3-5 PLOTS AND ONE-HALF OF OWNERS HAVE 3-10 PLOTS. AGRICULTURAL PRODUCTION OCCUPIES ABOUT 70 PERCENT OF THE LAND: 70 PERCENT IS SOWN IN ALFALFA, AND 25 PERCENT IN MAIZE AND WHEAT. A SMALL AREA IS PLANTED WITH FRUIT TREES (MAINLY PEARS AND FIGS) AND SOME LEGUMINOUS PLANTS: ALGARROBO (PROSOPIS CHILENSIS) AND CHANAR (GEOFFROEA DECORTICANS). LIVESTOCK RAISING IS CENTERED ON SHEEP, WITH GOATS IN SECOND PLACE AND SOME CATTLE, HORSES, MULES AND LLAMAS/VICUNAS. REGIONAL PROBLEMS ARE COMPLEX AND DIFFICULT: LIMITED RESOURCES, DEFECTIVE AGRARIAN STRUCTURE, LACK OF SUFFICIENT ACTIVE POPULATION, COMMERCIALIZATION AND CAPITAL. STABILITY HAS BEEN MOST AFFECTED BY CHANGES IN ITS RELATIONS WITH THE EXTERIOR AND BY ITS DEPENDENCY ON THE EVOLUTION OF THE TOWNS AND MINING CENTERS WHICH ARE ITS SOURCES OF WORK AND THE MARKET FOR ITS PRODUCTION.

ATACAMA/LAND TENURE/LAND USE/WATER SOURCES/SOCIAL ASPECTS/PLANNING/DEMOGRAPHY/  
AGRICULTURE/ECONOMIC DEVELOPMENT/MIGRATION/ECONOMIC IMPACT/REGIONAL ANALYSIS

4

ARANDA, X.

1966

EVOLUCION DE LA AGRICULTURA Y EL RIEGO EN EL NORTE CHICO (AGRICULTURAL  
EVOLUTION AND IRRIGATION IN THE NORTE CHICO).

INFORMACIONES GEOGRAFICAS (SANTIAGO) 16:9-41.

STARTING WITH A SHORT HISTORY OF LAND-USE AND TENURE IN THE NORTE CHICO REGION OF CHILE, IN PARTICULAR THE IMPACT OF MINING ON AGRICULTURAL ACTIVITIES, THE AUTHOR EXAMINES IN DETAIL THE HUASCO RIVER AREA. SPECIAL ATTENTION IS GIVEN TO IRRIGATION AND PROBLEMS RELATED TO WATER-RIGHTS AND USE.

LAND USE/LAND TENURE/MINING/AGRICULTURE/IRRIGATION/WATER UTILIZATION/  
WATER RIGHTS/ENVIRONMENTAL IMPACT

5

ARANDA, X.

1971

UN TIPO DE GANADERIA TRADICIONAL EN EL NORTE CHICO: LA TRANSHUMANCIA  
(A TYPE OF TRADITIONAL ANIMAL HUSBANDRY IN THE NORTE CHICO: TRANSHUMANCE).

SERVICIO AGRICOLA-GANADERO, CENTRO DEMOSTRATIVO CORRAL DE JULIO/UNIVERSIDAD  
DE CHILE, SANTIAGO, DEPARTAMENTO DE GEOGRAFIA. 194 P.

THOROUGH STUDY OF SEASONAL DISPLACEMENTS OF LIVESTOCK WHICH AFFECTS ABOUT 200,000 ANIMALS (CATTLE, SHEEP, GOATS, HORSES, MULES AND ASSES) IN THE NORTE CHICO REGION OF CHILE BETWEEN COPIAPO AND THE ACONCAGUA RIVER. IN THIS WAY, SUMMER PASTURES ARE OBTAINED FOR A PERIOD OF ABOUT FIVE MONTHS BETWEEN NOVEMBER AND APRIL. CLIMATIC CHARACTERISTICS OF THE REGION PROVIDE MOST FAVORABLE CONDITIONS IN THE LIMARI VALLEY WHICH ACCOUNTS FOR APPROXIMATELY 75 PERCENT OF DISPLACEMENTS. IN THIS AREA, LIVESTOCK IS MOVED FOR DISTANCES UP TO 200 KM. THE 1968 DROUGHT HAS AFFECTED THIS ACTIVITY BY REDUCING THE NUMBER OF ANIMALS INVOLVED, LINKED TO A GENERAL REDUCTION OF LIVESTOCK DUE TO THE PROLONGED DRY PERIOD. THE AUTHOR EXAMINES LAND-TENURE RELATIONS BOTH HISTORICALLY AND UNDER THE PRESENT CIRCUMSTANCES OF LAND REFORM WHICH HAS BROKEN UP THE LARGE ESTATES WHICH FORMERLY EXTENDED FROM THE COAST TO THE BOUNDARY WITH ARGENTINA. PRESENT USE OF MOUNTAIN PASTURES IS MAINLY UNDER RENTAL OR LEASE AGREEMENTS. CONCLUSIONS POINT TO THE DEFICIENT ECONOMIC CONDITIONS UNDER WHICH THE SYSTEM OPERATES, WITH INSUFFICIENT TECHNICAL MEANS, LOW-GRADE LIVESTOCK, LACK OF COMMERCIAL ORGANIZATION AND OUTLETS FOR SUBPRODUCTS (E.G. CHEESE). THE LACK OF SUFFICIENT INCENTIVE HAS LED TO INCREASED EXODUS OF RURAL POPULATION INVOLVED IN THIS ACTIVITY. THE NEED FOR FURTHER STUDY AND ASSISTANCE IS STRESSED, TOGETHER WITH THE NECESSITY OF EXAMINING SPECIFIC PROBLEMS, E.G. THE BENEFITS AND DAMAGES DUE TO THE GOAT POPULATION.

TRANSHUMANCE/DROUGHTS/LAND TENURE/LAND REFORM/ECONOMICS/SOCIAL ASPECTS/  
MIGRATION/DEMOGRAPHY/LIVESTOCK

6

BENNETT, A.

1968

DISTRIBUCION DE LAS AGUAS DEL RIO ELQUI Y SUS AFLUENTES POR LA SEQUIA  
1968-1969 (STREAMFLOW OF THE ELQUI RIVER AND ITS AFFLUENTS DURING THE  
1968-1969 DROUGHT).

JUNTA VIGILANCIA, RIO COQUIMBO. 20 P.

DROUGHTS/RIVERS/STREAMFLOW

7

BODINI, H.

1972

LA ANTIGUA PROVINCIA DE TARAPACA COMO REGION GEOGRAFICA Y EL ROL DE LA PAMPA DEL TAMARUGAL COMO CENTRO DE POBLAMIENTO (THE ANCIENT TARAPACA PROVINCE AS A GEOGRAPHICAL REGION AND THE ROLE OF THE PAMPA DEL TAMARUGAL AS A CENTER OF SETTLEMENT).

ASOCIACION DE GEOGRAFOS DE CHILE, BOLETIN 2(3):32-38.

EXPOSES BASES FOR A RESEARCH PROGRAM IN THE PAMPA DEL TAMARUGAL. RECENT SURVEY OF THE AREA POINTS TO A RELATIVE IMPORTANCE OF AGRICULTURAL ACTIVITIES AND SETTLEMENT IN NOW ABANDONED PARTS OF THE PAMPA.

PAMPA DEL TAMARUGAL/REGIONAL ANALYSIS/PLAINS/SETTLEMENTS/AGRICULTURE

8

BOIS, P.

1969

LAS LLUVIAS ANUALES EN CHILE, ANALISIS ESTADISTICO (ANNUAL RAINFALL IN CHILE: STATISTICAL ANALYSIS).

UNIVERSIDAD CATOLICA DE CHILE, SANTIAGO, DEPARTAMENTO DE OBRAS HIDRAULICAS. 52 P.

THE AUTHOR DEFINES THE MAIN STATISTICAL PARAMETERS TO BE USED IN THIS WORK. TOGETHER WITH THE GENERAL PLUVIOMETRIC CHARACTERISTICS OF DIFFERENT CHILEAN STATIONS, THE ARITHMETIC AND GEOMETRIC MEANS, COEFFICIENT OF VARIATION, ROQUIER'S 'K' COEFFICIENT, COEFFICIENT OF ASSYMETRY AND OTHER STATISTICS ARE GIVEN. THE RESULTS ARE DISCUSSED AND THE AUTHOR RECOMMENDS AN ADJUSTMENT OF SERIES WITH THE USE OF THE INCOMPLETE GAMMA FUNCTION.

RAINFALL/ANALYTICAL TECHNIQUES/WEATHER DATA/RAINFALL STATIONS

9

CAMACHU, C.

1973

CALIDAD BACTERIOLOGICA DEL AGUA OBTENIDA DE LA CAMANCHACA EN CERROS CERCANOS A ANTOFAGASTA (BACTERIOLOGICAL QUALITY OF WATER OBTAINED FROM FOG-DRIP ON RANGES CLOSE TO ANTOFAGASTA).

CIENCIA Y TECNOLOGIA MARINA (ANTOFAGASTA) (7):37-43.

ATMOSPHERIC CONDENSATION/COASTAL DESERTS/WATER QUALITY/BACTERIA

10

CAVIEDES, C.

1972

GEOMORFOLOGIA DEL CUATERNARIO DEL VALLE DEL ACONCAGUA, CHILE CENTRAL  
(GEOMORPHOLOGY OF THE QUATERNARY IN THE ACONCAGUA VALLEY, CENTRAL CHILE).

FREIBURGER GEOGRAPHISCHE HEFTE 11. 153 P.

THIS GEOMORPHOLOGICAL STUDY COVERS AN AREA MARGINAL TO THE SEMIARID REGION OF CHILE. OF PARTICULAR INTEREST FOR DESERTIFICATION RESEARCH IS THE ANALYSIS OF MORPHO-CLIMATIC CONDITIONS DURING THE QUATERNARY WHICH POINT TO ALTERNATING COOL-HUMID AND ARID-TEMPERATE PERIODS.

GEOMORPHOLOGY/QUATERNARY PERIOD/CLIMATIC GEOMORPHOLOGY

11

CAVIEDES, C.

1972

ON THE PALEOCIMATOLOGY OF THE CHILEAN LITTORAL.

IOWA GEOGRAPHER (29):8-14.

RECENT RESEARCH IN GEOMORPHOLOGY, PALEONTOLOGY AND PALEOBOTANY PERMITS AN ATTEMPT TO RECONSTRUCT THE CLIMATE OF THE CHILEAN COAST DURING THE LATE TERTIARY AND QUATERNARY. THE MOST PROFOUND CLIMATIC CHANGE APPEARS TO HAVE OCCURRED AT THE END OF THE TERTIARY. THE WARM CHARACTER OF TERTIARY CLIMATE GAVE WAY TO AN ALTERNATION OF COOL-HUMID AND TEMPERATE-SEMIARID EPISODES ACCOMPANIED BY A SHIFT IN THE CIRCULATION BELTS AND POSITION OF THE POLAR FRONT. THE WHOLE SYSTEM OF SUBTROPICAL ANTICYCLONE AND ASSOCIATED CIRCULATION IS SHOWN ON MAPS TO HAVE MOVED BY AS MUCH AS TEN DEGREES LATITUDE. BECAUSE OF THE VIGOUR OF REMNANTS FROM THE OLDER QUATERNARY GLACIATIONS, IT IS CONCLUDED THAT A COOL-HUMID PHASE ACCOMPANIED THESE, WHILE THE MORE RECENT GLACIAL EPISODES ARE LINKED TO THE TEMPERATE-SEMIARID PHASES.

SHORES/PALEOCLIMATOLOGY/TERTIARY PERIOD/QUATERNARY PERIOD/CLIMATIC CHANGE/  
SYNOPTIC METEOROLOGY/ANTICYCLONES/ATMOSPHERIC CIRCULATION

12

CAVIEDES, C.

1973

A CLIMATIC PROFILE OF THE NORTH CHILEAN DESERT AT LATITUDE 20 DEGREES SOUTH. IN D.H.K. AMIRAN AND A.W. WILSON, EDS., COASTAL DESERTS, THEIR NATURAL AND HUMAN ENVIRONMENTS, P. 115-121.

UNIVERSITY OF ARIZONA PRESS, TUCSON. 207 P.

CLIMATIC CHARACTERISTICS OF FOUR REGIONS: LITTORAL, PAMPAS, PIEDMONT, AND ANDEAN HIGHLANDS. DISCUSSION OF CLIMATIC ELEMENTS AND DYNAMICS OF THE CHILEAN DESERT CLIMATE.

COASTAL DESERTS/CLIMATE/PLAINS/SHORES/CLIMATOLOGY

13

CHILE, OFICINA METEOROLOGICA, SANTIAGO/WORLD METEOROLOGICAL ORGANIZATION, GENEVA

1970

RESUMEN ESTADO SEQUIA COPIAPO-CHILLAN (SUMMARY OF DROUGHT CONDITIONS IN THE COPIAPO-CHILLAN SECTOR).

SAME AS AUTHOR. COMISION NACIONAL DECENIO HIDROLOGICO/WHO, INTERNATIONAL HYDROLOGICAL DECADE. 9 P.

PART OF A SERIES OF REPORTS ON DROUGHT CONDITIONS DESCRIBING THE SERIOUSNESS OF DRY SPELLS AND REMEDIAL MEASURES UNDERTAKEN BY LOCAL AND NATIONAL AUTHORITIES.

DROUGHTS

14

COMISION CHILENA PARA EL ESTUDIO DE LAS ZONAS ARIDAS, SANTIAGO

1963

INFORME NACIONAL SOBRE LAS ZONAS ARIDAS DE CHILE (NATIONAL REPORT ON CHILE'S ARID ZONES).

SAME AS AUTHOR. 99 P.

COASTAL DESERTS

15

CORDERO, M.C.

1967

LOS GRANDES CAMPOS DE DUNAS DEL NORTE CHICO (THE GREAT DUNE FIELDS OF THE NORTE CHICO, CHILE).

UNIVERSIDAD DE CHILE, SANTIAGO, FACULTAD DE FILOSOFIA Y EDUCACION, SECCION GEOGRAFIA. 100 P. (UNPUBLISHED THESIS)

ACTIVE DUNE FIELDS IN THE NORTE CHICO SECTOR OF THE CHILEAN COAST (APPROX. 31-32 DEGREES S) CONSIST OF LONGITUDINAL AND TRANSVERSAL DUNES. LONGITUDINAL DUNES ARE ORIENTED PARALLEL TO PREVAILING SW-WINDS, THEY ARE FOUND CLOSE TO THE BEACHES. SMALL IN SIZE, SAND MOVEMENT IS SLIGHT. THE MUCH LARGER TRANSVERSAL DUNES, SEPARATED BY A RELATIVELY FLAT SWALE (A FORMER BEACH ?) FROM THE FIRST, ARE RESPONSIBLE FOR LARGE SAND MOVEMENTS, INVADING TERRAIN IN THEIR PATH.

COASTAL DESERTS/DUNES/BEACHES/WIND ACTION

16

CUNILL, P.

1971

FACTORES EN LA DESTRUCCION DEL PAISAJE CHILENO: RECOLECCION, CAZA Y TALA COLONIALES (FACTORS IN THE DESTRUCTION OF THE CHILEAN LANDSCAPE: FOOD GATHERING, HUNTING AND TREE FELLING IN THE COLONIAL PERIOD).

INFORMACIONES GEOGRAFICAS (SANTIAGO) NUMERO ESPECIAL. P. 235-264.

THE SPANISH COLONIZATION PROCESS HAD A PROFOUND IMPACT ON NATURAL VEGETATION AND WILDLIFE IN CHILE FROM ITS VERY START IN THE 16TH CENTURY. MAIN ACCESS FROM THE NORTH TRAVERSED THE ATACAMA AND SEMIARID REGIONS TO THE SOUTH, AND TRAVELERS ALONG THIS ROUTE HAD TO RELY ON THE SCARCE AVAILABLE RESOURCES. MINING ACTIVITIES CONTRIBUTED CONSIDERABLY TO THE DESTRUCTION OF NATURAL VEGETATION; THE NECESSITY OF PROVIDING WOOD FOR DIFFERENT USES AND FODDER FOR ANIMALS CREATED AN INCREASING DESERTIFICATION EFFECT, ESPECIALLY IN SEMIARID FRINGES SOUTH OF THE ATACAMA. TIMBER WAS ALSO EXPORTED AND OTHER PLANTS EXPLOITED FOR COMMERCIAL USE, E.G. PANGUE (GUNNERA CHILENSIS) FOR TANNING, AND BREA (TESSARIA ABSINTOIDES) FOR CALKING. INDISCRIMINATE HUNTING LED ALSO TO NEAR EXTINCTION OF CERTAIN ANIMALS, ESPECIALLY VIZCACHAS (LAGIDIUM, VISCACIA COVERI), GUANACO (LAMA GUANICOE) AND VICUNA (VICUGNA VICUGNA). A SIMILAR SITUATION AROSE IN CENTRAL CHILE WHERE MEDITERRANEAN-TYPE VEGETATION WAS SEVERELY EXPLOITED AND DAMAGED. THE URBANIZATION PROCESS HAD AN EXTREMELY NEGATIVE EFFECT ON THE ENVIRONMENT. REFERENCE IS MADE TO THE CONSEQUENCES OF HUNTING AND FISHING IN THE SOUTHEASTERN PACIFIC OCEAN NEAR THE CHILEAN COAST AND ON CHILEAN ISLANDS; EXTINCTION OF VALUABLE SPECIES AND SEVERE DAMAGE TO THE ECOLOGY.

ATACAMA/COASTS/ENVIRONMENTAL IMPACT/MINING/VEGETATION/PERTURBATION/WILDLIFE/DESERTIFICATION/LOGGING(TIMBER)/HUMAN BEHAVIOR/SETTLEMENTS

17

DEVYNCK, J.L.

1970

CONTRIBUCION AL ESTUDIO DE LA CIRCULACION ATMOSFERICA EN CHILE Y EL CLIMA DE LA REGION DEL BIO-BIO (CONTRIBUTION TO THE STUDY OF ATMOSPHERIC CIRCULATION IN CHILE AND THE CLIMATE OF THE BIO-BIO REGION).

UNIVERSIDAD DE CONCEPCION, DEPARTAMENTO DE GEOFISICA. 166 P.

STARTING FROM AN ANALYSIS OF THE SPATIAL AND TEMPORAL DISTRIBUTION OF PRECIPITATION IN CHILE, THEIR SEASONAL AND MONTHLY VARIABILITY, THE AUTHOR EXAMINES SPECIFIC SYNOPTIC SITUATIONS. FOR THE SPORADIC WINTER RAINFALL IN THE SEMIARID REGION, THE IMPORTANCE OF COLD AIR TRANSPORTS IN THE MIDDLE AND UPPER TROPOSPHERE IS STRESSED. FURTHER ON, THE DISTRIBUTION OF SOLAR RADIATION, CLOUDINESS AND TEMPERATURES IS ANALYZED. FOR THE CLIMATIC DIFFERENTIATION IN THE BIO-BIO REGION, PEGUY'S GRAPHIC METHOD AND GORCZINSKY'S CONTINENTALITY INDEX ARE USED TO ESTABLISH 11 CLIMATIC SUB-REGIONS IN THIS AREA.

PRECIPITATION(ATMOSPHERIC)/WEATHER PATTERNS/SYNOPTIC METEOROLOGY/TEMPERATURE/CLIMATIC ZONES/ATMOSPHERIC CIRCULATION/SEMIARID CLIMATE/SOLAR RADIATION/METEOROLOGICAL DATA

18

DIAZ, N./TAPIA, A.

1968

PRINCIPALES ASPECTOS DE LA EROSION EN LA PROVINCIA DE COQUIMBO (PRINCIPAL ASPECTS OF EROSION IN COQUIMBO PROVINCE).

UNIVERSIDAD DE CHILE, LA SERENA. 31 P.

EROSION

19

EREL, J.

1970

ALCANCES SOBRE EL USO RACIONAL DEL AGUA EN EL NORTE CHILENO (COMMENTS ON THE RATIONAL USE OF WATER IN THE CHILEAN NORTH).

PLANDES (SANTIAGO): EL HOMBRE EN LA ZONA ARIDA DEL NORTE CHILENO.

ANALYZES THE RELATIVE MERITS OF DIFFERENT IRRIGATION METHODS IN ARID REGIONS.

WATER UTILIZATION/IRRIGATION PRACTICES

20

ESPILODRA, B.

1972

ALGUNOS ANTECEDENTES HIDROLOGICOS DE LA SEQUIA EN CHILE (HYDROLOGICAL ANTECEDENTS OF THE DROUGHT IN CHILE).

UNESCO, SEMINARIO REGIONAL SOBRE HIDROLOGIA DE SEQUIAS, MONTEVIDEO, OFICINA DE CIENCIAS, ACTAS, P. 181-184.

GENERAL OBSERVATIONS ON CLIMATOLOGICAL CHARACTERISTICS OF THE 1968 DROUGHT IN CHILE, WITH REFERENCES TO TEMPERATURE ABNORMALITIES.

DROUGHTS/TEMPERATURE RANGES/CLIMATOLOGY

21

FRICK, G.

1970

DISTRIBUCION DE LAS LLUVIAS EN CHILE DURANTE LOS ULTIMOS 46 ANOS (RAINFALL DISTRIBUTION IN CHILE DURING THE LAST 46 YEARS).

SCIENTIA (VALPARAISO) 36(139):50-54.

STUDY OF RAINFALL VARIABILITY BETWEEN COPIAPO AND PUNTA ARENAS. EXAMINES POSSIBLE RELATION BETWEEN SOLAR ACTIVITY AND DROUGHT PERIODS.

RAINFALL/DROUGHTS/WEATHER PATTERN/SOLAR RADIATION

22

FUENZALIDA, H./ULRIKSEN, P./RUTLLANT, J.

1968

EVALUACION CRITICA DEL PROGRAMA M.E.T.A. (CRITICAL EVALUATION OF THE META PROGRAM).

UNIVERSIDAD DE CHILE, SANTIAGO, DEPARTAMENTO DE GEOFISICA Y GEODESIA.  
16 P.

THE M.E.T.A. PROGRAM WAS AN ATTEMPT TO INCREASE PRECIPITATION BY CLOUD SEEDING IN THE ARICA REGION OF CHILE. THIS PAPER CONTAINS A CRITICAL APPRAISAL OF THE SCIENTIFIC BASES AND OPERATIONAL ASPECTS OF THE PROGRAM AND ESTABLISHES COMPARISONS WITH SIMILAR ATTEMPTS IN CANADA, AUSTRALIA, U.S.A., AND ISRAEL.

PRECIPITATION(ATMOSPHERIC)/WEATHER MODIFICATION/CLOUD SEEDING

23

GAETE, A.

1974

ANALISIS ESTADISTICO DEL COMPORTAMIENTO DE LAS PRECIPITACIONES EN EL ALTIPLANO DE ARICA (STATISTICAL ANALYSIS OF RAINFALL IN THE ALTIPLANO OF ARICA, CHILE).

NORTE GRANDE 1(2):169-181.

POSSIBLE CYCLIC CHANGES IN PRECIPITATION REGIME DETECTED BY HARMONIC AND REGRESSION ANALYSIS AND THE LEAST-SQUARE METHOD. PRECIPITATIONS APPEAR TO DECLINE IN THE LAST 42 YEARS (1932-1973).

PLATEAUS/RAINFALL/WEATHER PATTERNS/ANALYTICAL TECHNIQUES/RAINFALL INTENSITY

24

GASTO, J.

1966

VARIACION DE LAS PRECIPITACIONES ANUALES EN CHILE (ANNUAL RAINFALL VARIATIONS IN CHILE).

UNIVERSIDAD DE CHILE, SANTIAGO, FACULTAD DE AGRONOMIA. 17 P.

STUDY OF INTER-ANNUAL VARIATIONS OF PRECIPITATION IN CHILE. THE DEGREE OF VARIABILITY WITH RESPECT TO THE MEAN RAINFALL GIVES ORIGIN TO 12 PLUVIOMETRIC REGIONS, FOLLOWING DI CASTRI'S ECOLOGIC REGIONS.

PRECIPITATION(ATMOSPHERIC)/CLIMATIC ZONES/RAINFALL/WEATHER PATTERNS

25

GUTIERREZ, R.

1969

LA SEQUIA: REVANCHA DEL AGUA (DROUGHT: WATER'S REVENGE).

PANORAMA ECONOMICO (SANTIAGO) 242:17-19.

DIRECT CONSEQUENCES OF THE 1967-1968 DROUGHT IN NORTHERN CENTRAL CHILE, I.E. IMPACT ON AGRICULTURE, LIVESTOCK, INDUSTRIAL AND URBAN ACTIVITIES.

DROUGHTS/ENVIRONMENTAL EFFECTS/AGRICULTURE/LIVESTOCK/URBAN AREAS

26

HAJEK, E.R./PACHECO, M./PASSAKACQUA, A.

1972

ANALISIS BIOCLIMATICO DE LA SEQUIA EN LA ZONA DE TENDENCIA MEDITERRANEA DE CHILE (BIOCLIMATIC ANALYSIS OF THE DROUGHT IN THE REGION OF MEDITERRANEAN CLIMATE IN CHILE).

UNIVERSIDAD CATOLICA DE CHILE, LABORATORIO DE ECOLOGIA, ESTUDIOS. 80 P.

BIOCLIMATIC APPROACH TO DROUGHT ANALYSIS. DE MARTONNE'S ARIDITY INDEX AND GAUSSEN-WALTER CLIMATIC DIAGRAMS WERE USED. BIOCLIMATIC REGIONS IN NORTHERN-CENTRAL CHILE APPEAR TO HAVE BEEN DISPLACED SOUTHWARD BY THE DROUGHT. STRESSES IMPORTANCE OF CONSIDERING NOT ONLY PLUVIOMETRIC BUT ALSO THERMIC CONDITIONS: 1967, THE YEAR PREVIOUS TO THE DROUGHT YEAR 1968, WAS ABNORMALLY COLD. CONTINUITY OF RESEARCH MIGHT SHED FURTHER LIGHT ON RECURRENCE OF SEQUENCES OF DROUGHT CONDITIONS AND INTERVALS OF MORE HUMID PERIODS DURING WHICH THE DESERTIFICATION IN THE NORTHERN PART OF THE AREA IS ARRESTED AND RECOVERY OF VEGETATION TAKES PLACE.

DROUGHTS/MEDITERRANEAN CLIMATE/BIOCLIMATOLOGY/WEATHER PATTERNS/RAINFALL/TEMPERATURE/DESERTIFICATION/REVEGETATION

27

HEILMAIER, E.

1970

LA ACTIVITY SOLAR Y LA PERIODICIDAD DE LAS SEQUIAS EN CHILE (SOLAR ACTIVITY AND DROUGHT PERIODICITY IN CHILE).

ORBITA (SANTIAGO) 2(4):22-33.

OUTLINES A POSSIBLE RELATIONSHIP BETWEEN DROUGHT PERIODS IN CHILE AND THE MAXIMA OF SOLAR ACTIVITY WITH A PERIOD OF 22 YEARS.

DROUGHTS/SOLAR RADIATION/WEATHER PATTERNS

28

HIRSCHMANN, J.

1971

DESPLAZAMIENTO DEL MAXIMO DE RADIACION SOLAR SOBRE AMERICA DEL SUR.

REVISTA DE ESTUDIOS DEL PACIFICO (VALPARAISO) (3):71-83.

EMPHASIZES AMOUNT OF SOLAR RADIATION RECEIVED IN THE NORTHERN CHILEAN DESERT. PRESENTS MAPS OF MEAN SOLAR RADIATION IN SOUTH AMERICA AND ITS SEASONAL DISPLACEMENTS.

SOLAR RADIATION/COASTAL DESERTS

29

HIRSCHMANN, J.

1971

INVESTIGACION DEL LABORATORIO DE ENERGIA SOLAR DE LA UNIVERSIDAD TECNICA SANTA MARIA RELACIONADA CON LAS ZONAS ARIDAS DEL NORTE DE CHILE (RESEARCH OF THE SOLAR ENERGY LABORATORY, SANTA MARIA TECHNICAL UNIVERSITY, RELATED TO THE ARID ZONES OF NORTHERN CHILE).

UNIVERSIDAD TECNICA FEDERICO SANTA MARIA, VALPARAISO, LABORATORIO DE ENERGIA SOLAR. 10 P.

THIS LABORATORY WAS SET UP IN THE ATACAMA WHERE THE HIGHEST AMOUNT OF SOLAR ENERGY ANYWHERE IN THE WORLD IS RECEIVED. AMONG DIFFERENT LINES OF RESEARCH MENTIONED ARE SOLAR STILLs, SOLAR OVENS, AND OTHER APPLICATIONS.

SOLAR ENERGY/ATACAMA/SOLAR STILLs/SOLAR ENERGY APPLICATIONS

30

KING, H.

1970

VARIACION DE ALGUNOS FACTORES METEOROLOGICOS EN CHILE A TRAVES DEL TIEMPO  
(TEMPORAL VARIATION OF SOME METEOROLOGICAL FACTORS IN CHILE).

UNIVERSIDAD DE CHILE, SANTIAGO, FACULTAD DE CIENCIAS FISICAS Y MATEMATICAS.  
105 P.

GENERAL DESCRIPTION OF CHILEAN CLIMATE. ANALYSIS OF PRECIPITATION,  
ATMOSPHERIC PRESSURE AND TEMPERATURES WITH THE HELP OF MOVING AVERAGES.

CLIMATE/PRECIPITATION/ATMOSPHERIC PRESSURE/TEMPERATURE/  
METEOROLOGICAL DATA

31

KUMMEROW, J.

1966

APORTE AL CONOCIMIENTO DE LAS CONDICIONES CLIMATICAS DEL BOSQUE DE FRAY JORGE  
(CONTRIBUTION TO KNOWLEDGE OF CLIMATIC CONDITIONS OF THE FRAY JORGE FOREST).

UNIVERSIDAD DE CHILE, MAIPU, ESTACION EXPERIMENTAL AGRONOMICA, BOLETIN  
TECNICO 24:21-24.

PRESENTS RESULTS OF FOUR YEARS OF RAINFALL AND FOG-DRIP MEASUREMENTS IN THE  
FRAY JORGE FOREST. FOG-DRIP IS UP TO TEN TIMES GREATER THAN PRECIPITATION IN  
THE SURROUNDING AREA WHERE MEAN RAINFALL IS APPROXIMATELY 100 MM. AVAILABLE  
MOISTURE PERMITS THE MAINTENANCE AND SURVIVAL OF A VALDIVIAN-TYPE RAINFOREST,  
WHERE CATCHING FRAMES OF ADEQUATE SIZE COULD PERMIT GROWTH OF NEWLY PLANTED  
TREES.

RAINFALL/ATMOSPHERIC CONDENSATION/FORESTS/FOG/FOREST MANAGEMENT/TECHNIQUES

32

LARRAIN, H.

1974

ANTECEDENTES HISTORICOS PARA UN ESTUDIO DE LA REUTILIZACION DE SUELOS  
AGRICOLAS EN LA PAMPA DEL TAMARUGAL, PROVINCIA DE TARAPACA, CHILE (HISTORICAL  
ANTECEDENTS FOR A STUDY OF RE-UTILIZATION OF AGRICULTURAL SOILS IN THE PAMPA  
DEL TAMARUGAL, TARAPACA PROVINCE, CHILE).

NORTE GRANDE 1(1):19-21.

AERIAL SURVEY OF THE PAMPA DEL TAMARUGAL SHOWED A NETWORK OF FORMERLY  
CULTIVATED PLOTS. HISTORICAL EVIDENCE AND RESEARCH IN THE AREA POINTS TO  
THE PREVIOUS EXISTENCE OF A REGULARLY OR INTERMITTENTLY CULTIVATED AND  
INHABITED PART OF THE PAMPA IN PRE-HISPANIC TIMES. WORK IS BEING CARRIED  
OUT TO ASCERTAIN AGRICULTURAL POTENTIAL FOR RE-UTILIZATION, CONSIDERING THE  
GOOD QUALITIES OF SOIL AND POSSIBILITY OF WATER SUPPLY.

PAMPA DEL TAMARUGAL/HISTORY/AERIAL PHOTOGRAPHY/CULTIVATED LANDS

33

MENESES, C.

1967

PROBLEMAS GEOGRAFICOS PARA EL DESARROLLO DE CHIU-CHIU Y LASANA (GEOGRAPHICAL PROBLEMS OF DEVELOPMENT OF CHIU-CHIU AND LASANA).

ASOCIACION DE GEOGRAFOS DE CHILE, SANTIAGO, BOLETIN 1(3):29-40.

DISCUSSES THE IMPACT OF EDUCATIONAL AND COMMUNICATION IMPROVEMENTS ON THE INHABITANTS OF CHIU-CHIU AND LASANA. BOTH VILLAGES ARE CLOSE TO THE MINING-URBAN COMPLEX OF CHUQUICAMATA-CALAMA WHERE BETTER WORK OPPORTUNITIES ARE AVAILABLE. THIS HAS LED TO EMIGRATION OF PEOPLE IN THE YOUNGER AGE-GROUPS OF THE ACTIVE POPULATION. A POSSIBILITY TO ARREST THIS SITUATION COULD BE THE IMPROVEMENT OF AGRICULTURAL AND LIVESTOCK ECONOMIES LINKED TO GOVERNMENTAL ASSISTANCE, BETTER USE OF AVAILABLE WATER RESOURCES AND IRRIGATION. CLOSENESS OF A CONSUMER MARKET IN CHUQUICAMATA-CALAMA IS A POSITIVE FACTOR.

SOCIAL ASPECTS/MIGRATION/ECONOMIC DEVELOPMENT/ECONOMIC IMPACT/LIVESTOCK/WATER UTILIZATION/AGRICULTURE/REGIONAL ANALYSIS

34

MOONEY, H.A./SCHLEGEL, F.

1967

LA VEGETACION COSTERA DEL CABO DE LOS MOLLES EN LA PROVINCIA DE ACONCAGUA (COASTAL VEGETATION OF CAPE LOS MOLLES, ACONCAGUA PROVINCE, CHILE).

UNIVERSIDAD DE CHILE, SANTIAGO, BOLETIN 75:27-32.

DESCRIPTION OF VEGETATIONAL COMMUNITIES IN A COASTAL AREA OF NORTHERN CENTRAL CHILE (NEAR 32 DEGREES) CHARACTERIZED BY CRYPTOCARYUM, LITHRAEUM, WITH IMPORTANT PARTICIPATION OF THE SHRUB LUCUMA VALPARADISEA.

COASTS/VEGETATION/PLANT COMMUNITIES/SHRUBS

35

MOONEY, H.A. ET AL

1970

VEGETATION CAMPARISONS BETWEEN THE MEDITERRANEAN CLIMATIC AREAS OF CALIFORNIA AND CHILE.

FLORA 159(5):480-496. SWRA W71-05470.

IN TERMS OF CLIMATIC GRADIENTS, TOPOGRAPHIC CONFIGURATIONS AND LAND-USE HISTORIES, CHILE AND CALIFORNIA ARE THE MOST COMPARABLE MEDITERRANEAN-CLIMATIC REGIONS, THUS FACILITATING EXTREMELY DIRECT VEGETATION COMPARISONS. GOING FROM THE MESIC TO THE ARID END OF THE CLIMATIC GRADIENT, HOMOLOGOUS PLANT COMMUNITY TYPES OCCUR: CLOSED EVERGREEN FOREST, DENSE EVERGREEN SCRUB, LOW SCRUB WITH MANY DROUGHT-DECIDUOUS ELEMENTS AND LOW SCRUB WITH MANY SUCCULENTS. THERE ARE NO COMMON GENERA BETWEEN THE TWO REGIONS, MAKING CLEAR THAT ANY STRUCTURAL SIMILARITIES MUST BE DUE TO EVOLUTIONARY CONVERGENCE. PRECIPITATION GRADIENTS EXTENDED FROM 80-1600 MM AND LATITUDES SPANNED FROM 30-43 DEGREES. THERE IS A REMARKABLE ALIGNMENT OF HOMOLOGOUS COMMUNITY TYPES WITH EQUAL LOW ELEVATION CLIMATIC REGIONS. HOWEVER, LOW EVERGREEN SCRUB IN CHILE HAS MORE DROUGHT-DECIDUOUS ELEMENTS THAN CALIFORNIA. ALSO, THE RICH MONTANE FORESTS OF THE SIERRA NEVADA ARE LACKING IN THE ANDES. THERE ARE ALSO EQUAL LATITUDINAL REPLACEMENTS OF COMMUNITY TYPES. (OALS)

EVERGREEN/SHRUBS/CHILE/ATACAMA/CALIFORNIA/MEDITERRANEAN CLIMATE/  
VEGETATION/ENVIRONMENTAL GRADIENT /EVOLUTION/SUCCULENTS/ARID LANDS/  
PLANT COMMUNITIES/XEROPHYTES/SCRUB/CLIMATIC-VEGETAL RELATIONSHIPS/LIFE  
FORMS(PLANTS)/PRECIPITATION(ATMOSPHERIC)/PRODUCTIVITY/PLANT GROWTH/  
OALS

36

MUNIZ, O.

1972

UNA MICRO-REGION DE ESTANCAMIENTO EN LA REGION II: PROVINCIA DE ANTOFAGASTA (A STAGNATED MICROREGION IN REGION II: ANTOFAGASTA PROVINCE). IN ENCUENTRO NACIONAL DE GEOGRAFIA, 6TH, ANTOFAGASTA, APORTE.

UNIVERSIDAD DEL NORTE, ANTOFAGASTA. 10 P.

SUBDIVISION OF OVER 125,000 SQ. KM. OF ANTOFAGASTA PROVINCE INTO MICROREGIONS IS PROPOSED AS A TOOL FOR REGIONAL ANALYSIS. THE AUTHOR STUDIES ONE SUCH MICROREGION, COMPRISING A SPARSELY POPULATED AREA WHERE THE POPULATION HAS BEEN DECLINING DUE TO DECAY OF TRADITIONAL LIFEFORMS AND THE ATTRACTION OF URBAN AND MINING CENTERS. THIS MIGRATION AFFECTS MAINLY THE YOUNGER AGE GROUPS OF THE ACTIVE POPULATION. SHORT REVIEW OF REGIONAL DIFFICULTIES LEADING TO STAGNATION IN THE FIELDS OF AGRICULTURE AND LIVESTOCK, COMMERCIALIZATION PROCESSES AND INFRASTRUCTURE.

REGIONAL ANALYSIS/MIGRATION/DEMOGRAPHY/SOCIAL ASPECTS/AGRICULTURE/LIVESTOCK/  
ECONOMIC DEVELOPMENT/ECONOMIC IMPACT

37

MUNOZ, R./ESPINOZA, C.

1970

ROCIO Y NIEBLAS: PECURSOROS HIDRICOS NO CONVENCIONALES EN LAS ZONAS ARIDAS (DEW AND FOGS: NON-CONVENTIONAL HYDRIC RESOURCES IN ARID ZONES).

PLANDES (SANTIAGO): EL HOMBRE EN LA ZONA ARIDA DEL NORTE CHILENO. P. 44-49.

BASED ON FIELD RESEARCH CARRIED OUT AT PORTEZUELO (23 DEGREES 42 MINUTES S 70 DEGREES 20 MINUTES W). EXAMINES DIFFERENT METHODS FOR OBTAINING WATER FROM FOG CONDENSATION ON NYLON SCREENS.

ARID LANDS/DEW/FOG/TECHNIQUES/ATMOSPHERIC CONDENSATION

38

PASKOFF, R.

1970

RECHERCHES GEOMORPHOLOGIQUES DAN LE CHILI SEMI-ARIDE.

BISCAYE FRERES, BORDEAUX. 420 P.

REGIONAL STRUCTURAL FACTORS AND CLIMATIC CONDITIONS ARE CONSIDERED FOR THE TERRITORY EXTENDING BETWEEN 30 AND 33 DEGREES SOUTH LATITUDE. THE AUTHDR BELIEVES A LONGER CHRONOLOGY THAN FORMERLY ACCEPTED IS NECESSARY TO ACCOUNT FOR THE GEOMORPHIC EVOLUTION OF THIS SEMIARID REGION. THE LITTORAL FRINGE WITH ITS STEP-LIKE WAVE-CUT TERRACES AND SAND DUNES HAS BEEN SURVEYED, AND FLUVIAL TERRACES OF THE ELQUI RIVER VALLEY HAVE BEEN MAPPED. GENERAL PROBLEMS OF THE QUATERNARY ARE DISCUSSED, INCLUDING CLIMATIC CHANGES, SEA LEVEL VARIATIONS, AND NEOTECTONIC ACTIVITY. INCLUDED ARE GEOMORPHIC MAPS, ENGLISH AND SPANISH CHAPTER SUMMARIES, AND AN EXTENSIVE BIBLIOGRAPHY.

DALS/CHILE/GEOMORPHOLOGY/SEMIARID CLIMATE/BIBLIOGRAPHIES/QUATERNARY PERIOD/COASTAL TOPOGRAPHIC FEATURES

39

PASKOFF, R.

1973

THE PLIO-QUATERNARY CLIMATIC CHANGES ALONG THE SEMIARID SEABORD OF CHILE. IN D.M.K. AMIRAN AND A.W. WILSON, EDS., COASTAL DESERTS, THEIR NATURAL AND HUMAN ENVIRONMENTS, P. 147-151.

UNIVERSITY OF ARIZONA PRESS, TUCSON. 207 P.

THE CLIMATE ALONG THE SEMIARID CHILEAN COAST APPEARS TO HAVE CHANGED FROM A WARM HUMID TROPICAL TYPE AT THE END OF THE TERTIARY, TO A COOLER AND MORE ARID TYPE IN THE QUATERNARY. DURING THE PLEISTOCENE OCCURRED AN ALTERNATION BETWEEN HUMID PHASES ACCOMPANIED BY A COOLING OF THE ATMOSPHERE AND DRY PERIODS MARKED BY A WARMING.

COASTS/CLIMATIC CHANGE/SEMIARID CLIMATE/TERTIARY PERIOD/QUATERNARY PERIOD/ PALEOCLIMATOLOGY/PLEISTOCENE EPOCH/COASTAL DESERTS

40

PEJHL, K.

1966

STUDIE O KOLISANI KLIMATU V HISTORICKE DOBE NA ZAPADNIM POBREZI JIZNI AMERIKY (STUDY ON CLIMATE FLUCTUATIONS IN THE HISTORICAL TIME OF THE WESTERN COAST OF SOUTH AMERICA).

HYDROMETEOROLOGICKY USTAV, PRAGUE 82 P. MGA 19.7-453.

DROUGHT INDICES COMPUTED FOR MIDDLE AND NORTH CHILE, AND RELATED TO THE 1690-1930 PERIOD PROVE THAT THE SEVEREST DROUGHTS OCCURRED WITHIN 1781-1810. FLUCTUATIONS OF CLIMATE IN THE MEDIAN PART OF THE WESTERN REGIONS OF SOUTH AMERICA ARE CAUSED BY EXTREME SHIFTS OF THE ITCZ AND BY CHANGES IN MAGNITUDE OF THE PERUVIAN STREAM. ONLY FLUCTUATIONS IN, NOT CHANGES OF, CLIMATE WERE ESTABLISHED.

PERU/CHILE/CLIMATE/DROUGHTS/COASTS/DALS

41

PIZARRO, H./RIVAS, R.

1965

IRREGULARIDAD DE LAS PRECIPITACIONES EN EL NORTE CHICO.

CHILE, OFICINA METEOROLOGICA, SANTIAGO.

NOTE ON SOME PLUVIOMETRIC SERIES FROM NORTHERN CENTRAL CHILE. POINTS TO THE POSSIBILITY OF A TREND TOWARDS DIMINISHING PRECIPITATION IN THIS AREA.

PRECIPITATION(ATMOSPHERIC)/WEATHER DATA/WEATHER PATTERNS/PRECIPITATION DEFICIT

42

RUTLLANT, J.

1972

RESULTADO DE LA CAMPANA DE MEDICIONES METEOROLOGICAS REALIZADAS EN LA PROVINCIA DE ANTOFAGASTA, 19.7 - 5.8 1970 (RESULTS OF METEOROLOGICAL DATA COLLECTION IN ANTOFAGASTA PROVINCE).

UNIVERSIDAD DE CHILE, SANTIAGO, DEPARTAMENTO DE GEOFISICA Y GEODESIA. 77 P.

METEOROLOGICAL DATA

43

RUTLLANT, J./SIPPA, A.

1971

ALGUNAS CARACTERISTICAS DE LA INVERSION DE SUBSIDENCIA DEL ANTICICLON SUBTROPICAL (SOME CHARACTERISTICS OF THE SUBSIDENCE INVERSION OF THE SUBTROPICAL ANTICYCLONE).

UNIVERSIDAD DE CHILE, SANTIAGO, DEPARTAMENTO DE GEOFISICA Y GEODESIA. 14 P.

SOUTHEASTERN PACIFIC WEATHER IS CLOSELY LINKED TO THE POSITION AND STRENGTH OF THE ANTICYCLONIC CELL POSITIONED SEMI-PERMANENTLY IN SUBTROPICAL LATITUDES OFF THE CHILEAN COAST. THIS PAPER IS BASED MAINLY ON RADIOSONDE DATA FROM ANTOFAGASTA AND QUINTERO STATIONS BETWEEN 1962 AND 1968 (ANTOFAGASTA) AND 1964-1965 (QUINTERO). STATISTICAL DATA INCLUDE TEMPERATURE INCREASE WITH ALTITUDE, VERTICAL INCREASE OF MIXING RATIO, HEIGHT OF THE BASE OF THE INVERSION AND ITS THICKNESS. IMPORTANCE OF THESE CHARACTERISTICS IS STRESSED NOT ONLY BECAUSE OF THEIR RELATION WITH CHILE'S CLIMATE AND ARIDITY OVER EXTENDED AREAS BUT ALSO WITH RESPECT TO VERTICAL WIND VARIATIONS, CONCENTRATION AND DIFFUSION OF ATMOSPHERIC POLLUTANTS IN THE LOWER ATMOSPHERE, CUMULIFORM CLOUD COVER ASSOCIATED WITH THE INVERSION'S BASE AND THE PROPAGATION OF ELECTROMAGNETIC RADIATION.

COASTS/ANTICYCLONES/METEOROLOGICAL DATA/CLIMATE/WIND(METEOROLOGY)/CLOUD COVER/  
AIR POLLUTION/ELECTROMAGNETIC WAVES

44

SANTANA, R.

1967

EL RIO SALADO Y EL SECTOR ORIENTAL DE LA CUENCA DE CALAMA (THE SALADO RIVER AND THE EASTERN SECTOR OF THE CALAMA BASIN, CHILE).

ASOCIACION DE GEOGRAFOS DE CHILE, BOLETIN 1(3):21-28.

THE SALADO RIVER IS THE MAIN AFFLUENT OF THE LOA, THE ONLY IMPORTANT STREAM IN THE CHILEAN DESERT. THIS GEOMORPHOLOGICAL NOTE COMMENTS BRIEFLY ON THE MAJOR RELIEF UNITS IN THE AREA, THEIR STRUCTURAL CHARACTERISTICS AND LANDFORMS. THE RELATIVELY DISCRETE ACTION OF EROSION MAKES THE AUTHOR CONCLUDE THAT THIS SECTOR HAS HAD ARID CONDITIONS FOR A LONG PERIOD.

RIVER BASINS/LANDFORMS/TOPOGRAPHIC FEATURES/CLIMATIC GEOMORPHOLOGY

45

SCHNEIDER, H.J.

1969

EL CLIMA DEL NORTE CHICO (THE CLIMATE OF THE NORTE CHICO).

UNIVERSIDAD DE CHILE, SANTIAGO, DEPARTAMENTO DE GEOGRAFIA. 132 P.

THE NORTE CHICO (CHILE) IS A SEMI-ARID TRANSITIONAL REGION BETWEEN THE ATACAMA TO THE NORTH AND THE SUBHUMID SUMMER-DRY PROVINCES TO THE SOUTH. ITS CLIMATIC HISTORY HAS BEEN ONE OF SLIGHTLY DRIER AND WETTER EPISODES WITH FIRST THE INDIGENOUS INHABITANTS AND LATER THE SPANISH SETTLERS EVOLVING A PATTERN OF OCCUPATION ADAPTED TO SCARCITY OF RESOURCES AND WATER. ANALYZES BRIEFLY THE DYNAMIC FEATURES OF THE REGIONAL CLIMATE, ELEMENTS AND FACTORS OF CLIMATE BASED ON A RELATIVELY IMPORTANT NETWORK OF CLIMATOLOGICAL AND PLUVIOMETRIC STATIONS. EXAMINES THE USE OF SEVERAL ARIDITY INDICES.

COASTS/SEMIARID CLIMATE/CLIMATIC DATA/RAINFALL STATIONS/ATMOSPHERIC PRESSURE/  
ATMOSPHERIC CIRCULATION/ANTICYCLONES/WEATHER PATTERNS/TEMPERATURE INVERSION/  
ARIDITY INDEX/MARTONNE, E. DE/THORNTHWAITE, C.W./EMBERGER, L./CLIMATIC ZONES

46

SCHNEIDER, H.J.

1970

LA SEQUIA DE 1968 EN CHILE (THE 1968 DROUGHT IN CHILE).

INFORMACIONES GEOGRAFICAS (SANTIAGO) 11:159-176.

1968 WAS ONE OF THE DRIEST YEARS ON RECORD IN NORTHERN AND CENTRAL CHILE, AFFECTING NOT ONLY THE SEMI-ARID NORTE CHICO BUT ALSO A MAJOR SECTOR OF CENTRAL CHILE WHERE 75 PERCENT OF THE POPULATION LIVES AND WHICH CONCENTRATES CHILE'S INDUSTRIAL AND AGRICULTURAL ACTIVITIES. THE EXTENT OF DROUGHT CONDITIONS IS ANALYZED BY COMPARISON WITH THE FREQUENTIAL DISTRIBUTION OF PRECIPITATION IN CHILE. A MAP OF MEDIAN PRECIPITATION SHOWS THE IMPACT OF THE DROUGHT AS COMPARED TO THE 30-YEAR MEDIAN. AS RAINFALL IS HIGHLY CONCENTRATED (OVER 80 PERCENT) IN WINTER (APRIL-SEPTEMBER), A SERIES OF GRAPHS FOR 16 STATIONS SHOWS MEAN PRECIPITATION AGAINST 1968. FOR A FEW STATIONS IN THE SOUTH WHERE SUMMER RAINFALL IS IMPORTANT, REFERENCE IS MADE TO 1968 SUMMER CONDITIONS. FINALLY, THE PAPER POINTS TO POSSIBLE EXPLANATION OF DROUGHT: A LARGE SCALE DISTURBANCE OF THE SOUTHERN HEMISPHERE'S CIRCULATION IN THE SOUTH AMERICAN SECTOR. THIS LED TO A HIGHER PERSISTENCE OF THE SE-PACIFIC ANTICYCLONE IN ABNORMALLY HIGH LATITUDES AND BLOCKING OF RAIN-BEARING DEPRESSIONS.

DROUGHTS/PRECIPITATION(ATMOSPHERIC)/RAINFALL STATIONS/WEATHER PATTERNS/  
ATMOSPHERIC CIRCULATION/ANTICYCLONES/METEOROLOGY

47

SCHNEIDER, H.J.

1970

TIPDS DE TIEMPO EN CHILE CENTRAL (WEATHER TYPES IN CENTRAL CHILE).

CUADERNOS GEOGRAFICOS DEL SUR (CONCEPCION) (1):77-93.

AFTER A REVIEW OF FEATURES OF THE REGIONAL ATMOSPHERIC CIRCULATION AND IN PARTICULAR, THE IMPORTANT ROLE OF THE HIGH PRESSURE CENTER OF THE SE-PACIFIC, THE MAIN WEATHER TYPES OF CENTRAL CHILE ARE DISCUSSED. ANTICYCLONAL SITUATIONS APPEAR TO BE DOMINANT, ESPECIALLY FOR THE NORTHERN PART OF THE REGION, THROUGHOUT THE YEAR. SUBSIDING AIR FROM THE ANTICYCLONE HELPS TO ESTABLISH A SUBSIDENCE INVERSION REACHING UP TO 1000 OR MORE METERS. ANTICYCLONIC WEATHER IS RESPONSIBLE FOR THE LONG SPELLS OF EXTREMELY DRY WEATHER, CHARACTERISTIC FOR THE REGION IN SUMMER AND TRANSITIONAL SEASONS WITH A FREQUENT DRY PERIOD OF 8 MONTHS. THE POSITION AND STRENGTH OF THE ANTICYCLONE DETERMINES LARGELY THE ADVANCE OF DEPRESSIONS FROM THE SOUTH, SOUTHWEST AND WEST. THIS IS SHOWN IN SERIES OF SURFACE AND UPPER-AIR CHARTS. REFERENCE IS MADE TO UPPER-AIR LOWS (COLD DROPS), THE WEAKNESS OF CONVECTIONAL PROCESSES AND THE LINKS BETWEEN SURFACE AND UPPER-AIR CIRCULATION.

ATMOSPHERIC CIRCULATION/ATMOSPHERIC PRESSURE/ANTICYCLONES/WEATHER PATTERNS/  
DRY SEASONS

48

SOCIEDAD NACIONAL DE AGRICULTURA

1968

ANTECEDENTES HISTORICOS, DATOS E INFORMACIONES DE LA SOCIEDAD NACIONAL DE AGRICULTURA SOBRE LA SEQUIA (HISTORICAL BACKGROUND, DATA AND INFORMATION ON THE DROUGHT).

CAMPESINO 99(9):24-37, (10):20-24.

DROUGHTS/CLIMATIC DATA

49

TRICART, J.

1966

ALGUNAS OBSERVACIONES GEOMORFOLOGICAS SOBRE LAS TERRAZAS DEL RIO COPIAPO.

INFORMACIONES GEOGRAPHICAS (SANTIAGO) 15:37-50.

TERRASSES MISES EN PLACE LORS DE PERIODES PLUS HUMIDES ET FORTEMENT DEFORMEES PAR LA TECTONIQUE. MECANISMES DE SALINISATION DES NAPPES AQUIFERES.

TERRACES(GEOMORPHOLOGY)/SALINITY/RIVERS/GEOMORPHOLOGY

50

TRICART, J.

1966

FORMES DE RELIEF ARIDE DANS LES ANDES (SALAR DEL HUASCO).

PHOTOJ INTERPRETATION (PARIS) 66(4):22-28.

PHOTOGRAPHIES AERIENNES COMMENTEES MONTRANT UNE CUVETTE ENDORFIQUE AVEC DES TRACES DE NIVEAUX LACUSTRES QUI ONT PU ETRE CORRELES AVEC LES MORAINES DES DEUX DERNIERES GLACIATIONS.

TOPOGRAPHIC FEATURES/AERIAL PHOTOGRAPHY/BASINS/GEOMORPHOLOGY

51

TRICART, J.

1966

UN CHOTT DANS LE DESERT CHILIEN: LA PAMPA DEL TAMARUGAL.

REVUE DE GEOMORPHOLOGIE DYNAMIQUE 16(1):12-22.

FOSSE D'EFFONDREMENT ENTRE LA PRECORDILLERE ET LA CORDILLELE LITTORALE, LA PAMPA DEL TAMARUGAL EST REMBLAYEE DE CONES DE DEJECTION MIS EN PLACE PENDANT DES PERIODES PLUS HUMIDES. LES CRUES ACTUELLES S'Y INFILTRENT ET REAPPARAISSENT DANS LES DEPRESSIONS OU ELLES S'EVAPORENT EN ARRIVANT PRES DE LA SURFACE ET NOURISSENT DES ENCROUTEMENTS SALES. CEUX-CI JALONNENT LES SITES OU ON PEU TROUVER DE L'EAU A FAIBLE PROFONDEUR. POUR L'AMENAGEMENT, IL FAUDRA LA CAPTER AVANT QUE L'EVAPORATION SUPERFICIELLE N'Y AIT CONCENTRE LES SELS.

GEOMORPHOLOGY/GROUNDWATER/BASINS/CLIMATIC GEOMORPHOLOGY/PAMPA DEL TAMARUGAL/AQUIFERS/EVAPORATION/WIND ACTION

52

TRICART, J.

1969 - 1970

LE SALAR DEL HUASCO: ETUDE GEOMORPHOLOGIQUE.

REVUE DE GEOMORPHOLOGIE DYNAMIQUE 19(2):49-84.

CARTE GEOMORPHOLOGIQUE DETAILLEE MONTRANT L'IMBRICATION DES CONES ET RIVAGES LACUSTRES DATANT DES PERIODES HUMIDES (COINCIDANT AVEC LES DEUX DERNIERES GLACIATIONS), DES MANIFESTATIONS EOLIENNES DES PERIODES SECHES, UNE CUVETTE SALEE ACTUELLE. ANALYSE DES PROCESSUS. EVOLUTION GEOMORPHOLOGIQUE.

LANDFORMS/GEOMORPHOLOGY/BASINS/SALINE SOILS/WIND ACTION

53

VAN HUSEN, C.

1967

KLIMAGLIEDERUNG IN CHILE AUF DER BASIS VON HAEUFIGKEITSVERTEILUNGEN DER NIEDERSCHLAGSSUMMEN (CLIMATE CLASSIFICATION IN CHILE ON THE BASIS OF FREQUENCY DISTRIBUTION OF PRECIPITATION TOTALS).

FREIBURGER GEOGRAPHISCHE 4. 133 P. MGA 20.2-14.

THE PRECIPITATION CONDITIONS IN CHILE ARE INVESTIGATED AND A CRITERION FOR THE CLIMATIC CLASSIFICATION DEVELOPED ON THE BASIS OF FREQUENCY ANALYSIS OF THE MONTHLY PRECIPITATION. THE PRECIPITATION AGGREGATES WERE FORMED OUT OF THE SEPARATE PRECIPITATION TOTALS FOR THE 3 MONTHS EACH OF SUMMER AND WINTER. OF THE ZONES DISTINGUISHED FROM ONE ANOTHER BY DEFINITE HYDRIC CHARACTERISTICS IS THE ZONE OF TOTAL ANNUAL DROUGHT (30 DEGREES TO THE EQUATOR).

CHILE/CLIMATE/PRECIPITATION(ATMOSPHERIC)/DROUGHTS/OALS

54

WEISCHET, W.

1966

ZUR KLIMATOLOGIE DER NORDCHILENISCHEN WUESTE (ON THE CLIMATOLOGY OF THE NORTHERN CHILEAN DESERT).

METEOROLOGISCHE RUNDSCHAU 19(1):1-7.

CHARACTERISTICS OF THE DESERTS IN NORTHERN CHILE: COASTAL DESERT WITH HIGH RELATIVE HUMIDITY AND A SEMI-PERMANENT LAYER OF HIGH CLOUD UNDER AN INVERSION. LOW THERMAL AMPLITUDE, BOTH DIURNAL AND ANNUAL. INTERIOR DESERT WITH LITTLE CLOUD COVER, LOW HUMIDITY AND HIGH DIURNAL THERMAL AMPLITUDE. THE PAMPA DEL TAMARUGAL IS THE DESERT CORE AND CAN BE COMPARED TO SUBTROPICAL DESERTS OF THE AFRICAN-ASIAN CONTINENTS. TOWARDS THE EAST OF THE INTERIOR DESERT, THE 10 MM ISOHYET DELIMITS THE MOUNTAIN BORDER DESERT.

CLIMATE/COASTAL DESERTS/DESERTS/CLOUD COVER/HUMIDITY/TEMPERATURE/ISOHYETS/  
PAMPA DEL TAMARUGAL

55

WOLLMAN, N.

1968

THE WATER RESOURCES OF CHILE: AN ECONOMIC METHOD FOR ANALYZING A KEY RESOURCE IN A NATION'S DEVELOPMENT.

JOHNS HOPKINS PRESS, BALTIMORE. 279 P. SWRA 2(5)W69-01654,  
3(2)W70-00699.

THE WATER RESOURCES OF CHILE ARE EXAMINED IN DETAIL BECAUSE OF A LONG TRADITION OF IRRIGATED AGRICULTURE AND THE AVAILABILITY OF BETTER HYDROLOGICAL DATA THAN CAN BE FOUND ELSEWHERE IN LATIN AMERICA. TREATED ARE SUCH TOPICS AS USE OF WATER FOR IRRIGATION PROJECTS, PROJECTION OF AGRICULTURAL WATER USE, WASTE TREATMENT, COSTS, QUALITY, AND GEOGRAPHY. THERE IS NO FORESEEABLE WATER SHORTAGE IF SUPPLIES ARE COMPARED WITH PROJECTED REQUIREMENTS, BUT THERE WILL BE LOCAL SHORTAGES IN DRIER IRRIGATED AREAS IN THE NORTH.

CHILE/WATER RESOURCES DEVELOPMENT/IRRIGATION PROGRAMS/WATER SUPPLY/  
REGIONAL ANALYSIS/HYDROLOGIC DATA/WASTE WATER TREATMENT/WATER COSTS/  
WATER QUALITY/OALS

56

ZEPEDA, H.

1974

CLIMATOLOGIA CHILENA (1931-1973).

INSTITUTO DE INVESTIGACION DE RECURSOS NATURALES IREN/CORFO, SANTIAGO,  
INFORMACION BIBLIOGRAFICA 3. 77 P.

REFERENCES TO CLIMATOLOGICAL PAPERS PUBLISHED RECENTLY (1931-1973) IN CHILE AND ABROAD WITH BRIEF DESCRIPTIONS AND SOME CRITICAL COMMENTS.

CLIMATOLOGY

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SOUTH AMERICA

Peru

## PERU

1

AARDNS, J./VITA-FINZI, C.

1960

THE USELESS LAND; A WINTER IN THE ATACAMA DESERT. FOREWORD BY GLYN DANIEL.

R. HALE, LONDON. 191 P.

ATACAMA/COASTAL DESERTS/WINTER

2

AMIPAN, D.H.K.

1970

EL DESIERTO DE SECHURA, PERU: PROBLEMS OF AGRICULTURAL USE OF DESERTS.

REVISTA GEOGRAFICA 72:7-12. SWRA W71-10490.

AGRICULTURAL DEVELOPMENT IN DESERT REGIONS IS SUBJECT TO MANY PROBLEMS, AND THIS IS WELL ILLUSTRATED IN THE AREA OF PIURA, LOCATED IN THE DESERT OF SECHURA, ONE OF THE WIDEST SECTIONS OF THE PERUVIAN COASTAL DESERT. ESTABLISHED ABOUT 40 YEARS AGO, THE AREA HAS 1300 FARMING UNITS OF 40 HECTARES EACH. COTTON IS THE MAIN CROP IRRIGATED BY BASIN FLOODING FROM THE PIURA RIVER. ADDITIONAL WATER SOURCES ARE WELLS SUFFERING FROM SEVERE OVERDRAFTS AND CONSEQUENT RISING SALINITY LEVELS, LEADING TO EXTENSIVE LAND DETERIORATION. THE RIVER ITSELF TURNS INTO AN ALKALINE DRAINAGE DITCH DURING LOW WATER SEASON DUE TO LACK OF A SEPARATE DRAINAGE SYSTEM FOR REMOVING USED IRRIGATION WATER. A SIZABLE STORAGE RESERVOIR WITH A CAPACITY OF 258 MILLION CUBIC METERS HAS BEEN BUILT AT SAN LORENZO, BUT SUFFERS FROM ENORMOUS EVAPORATIVE LOSSES AND AN INSUFFICIENT REGIONAL HYDROLOGIC DATA BASE. AMAZINGLY, IN THIS REGION SUFFERING FROM A SPECTRUM OF RESOURCE PROBLEMS, THERE IS NO AGRICULTURAL RESEARCH STATION. NOT FAR TO THE NORTH, THE LARGE EFFICIENT MALLARES FARM (6000 HECTARES) FURNISHES A STARTLING CONTRAST IN DESERT AGRICULTURE. INTELLIGENT LOCAL MANAGEMENT RESULTS IN A PROSPEROUS ENTERPRISE, INTEGRATING ADVANCED AGRICULTURE TECHNIQUES, BIOLOGICAL PEST CONTROL AND MINIMUM USE OF PESTICIDES AND ARTIFICIAL FERTILIZERS, AND FIRST AND FOREMOST, A STRICT IRRIGATION CUM DRAINAGE REGIME. (DAIS)

DAIS/ARID LANDS/IRRIGATION PRACTICES/SALINE WATER/LAND USE/LAND MANAGEMENT/WATER CONSERVATION/GROUNDWATER/RESERVOIRS/WATER RESOURCES DEVELOPMENT/WATER SOURCES/ENVIRONMENTAL EFFECTS/EVAPORATION/REGIONAL ANALYSIS/PERU/PERUVIAN DESERT/GOSSYPIUM/ORYZA/CROP PRODUCTION/PESTS(INSECTS)/BIOLOGICAL CONTROLS/PESTICIDES/SECHURA DESERT/WATER MANAGEMENT

3

ANTUNEZ DE MAYOLO, S.

1951

PROYECTO DE DESVIACION DEL RIO MANTARO AL RIMAC MEDIANTE UN TUNEL PASADOR A TRAVES DE LOS ANDES (THE MANTARO RIVER DEVIATION PROJECT: MANTARO-RIMAC CONNECTION BY A TUNNEL THROUGH THE ANDES).

IMPRESA EL CONDOR, LIMA. 74 P.

CONSIDERS THE POSSIBILITY OF DIVERTING PART OF THE WATERS OF THE MANTARO RIVER TO THE RIMAC WHICH COULD PROVIDE 1.1 MILLION HP FOR ELECTRIC ENERGY FOR THE LIMA AREA AND NECESSARY WATER FOR THE CITY. AN ESTIMATE OF AVAILABLE WATER RESOURCES IN THE RIMAC VALLEY IS GIVEN, FOLLOWED BY PROBABLE WATER NEEDS IN THE FUTURE AND A REFERENCE TO INVESTMENTS NECESSARY TO FINANCE THE PROJECT.

WATER TRANSFER/INTER-BASIN TRANSFERS/WATER RESOURCES/ELECTRIC POWER/  
ECONOMIC DEVELOPMENT

4

BJERKNES, J.

1961

ESTUDIO DEL NIÑO BASADO EN EL ANALISIS DE LAS TEMPERATURAS DE LA SUPERFICIE DEL OCEANO DE 1935-1957 (STUDY OF EL NIÑO CURRENT BASED ON WATER SURFACE TEMPERATURES 1935-1957).

COMPANIA ADMINISTRADORA DEL GUANO, LIMA, BOLETIN 30(9)18-20.

ANALYZES THE SEASONAL CHANGES IN THE ATMOSPHERIC CIRCULATION OF THE EASTERN SOUTH PACIFIC AND THE INFLUENCE OF THE CIRCULATION ON SURFACE WATER TEMPERATURES.

NIÑO/ATMOSPHERIC CIRCULATION/WATER TEMPERATURE/CLIMATOLOGY/WEATHER PATTERNS/  
SEASONAL/PERU CURRENT/OCEAN CURRENTS

5

BROGGI, J.A.

1950

MIGRACION DE ARENAS A LO LARGO DE LA COSTA PERUANA (SAND MOVEMENT ALONG THE PERUVIAN COAST).

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 24. 25 P.

THE EXTENSIVE SAND DUNES WHICH COVER THE NORTHERN DESERTS, ESPECIALLY THE SECHURA DESERT, REPRESENT THE WIND-BORNE SANDY REMNANTS OF EROSION PRODUCTS OF THE DESTRUCTION OF THE ROCKY SLOPES OF THE SOUTHERN PART OF THE WESTERN ANDES.

SECHURA DESERT/SAND DUNES/EOLIAN SOILS/WIND ACTION

6

BROGGI, J.A.

1956

AL MARGEN DEL PRIMER MAPA CLIMATOLOGICO DEL PERU (NOTES ON THE FIRST CLIMATOLOGICAL MAP OF PERU).

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 30:107-110.

CLASSIFICATION OF CLIMATIC TYPES OF PERU.

CLIMATOLOGY/MAPS/CLIMATIC ZONES

7

BROGGI, J.A.

1961

LAS CICLOPEAS DUNAS COMPUESTAS DE LA COSTA PERUANA, SU ORIGEN Y SIGNIFICACION CLIMATICA (CYCLOPEAN COMPOSITE DUNES OF THE PERUVIAN COAST, THEIR ORIGIN AND CLIMATIC SIGNIFICANCE).

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 36:61-66.

THE COMPOSITE DUNE OF PUR PUR AND POSSIBLE RELATIONS WITH POST-GLACIAL CLIMATIC CHANGE.

DUNES/COASTAL TOPOGRAPHIC FEATURES/CLIMATIC CHANGE/GEOMORPHOLOGY/  
CLIMATIC GEOMORPHOLOGY

8

COBB, L.G.

1967

THE EL NINO PHENOMENON AND RAINFALL IN PERU AND ECUADOR. IN W.K. HENRY, ET AL, RESEARCH ON TROPICAL RAINFALL PATTERNS AND ASSOCIATED MESOSCALE SYSTEMS, P. 87-103.

U.S. ARMY ELECTRONICS COMMAND, FT. MONMOUTH, N.J., TECHNICAL REPORT ECOM-02313-S2. SWRA W70-01816.

THE COLD PERU OR HUMBOLDT CURRENT ALONG THE WEST COAST OF SOUTH AMERICA CAUSES COLDER SURFACE WATER TEMPERATURES ALONG THE COAST THAN ALONG THE OPEN OCEAN. THE DESERTS OF CHILE AND PERU ARE A RESULT. AT INTERVALS OF SEVERAL YEARS A GENERAL WEAKENING OF ATMOSPHERIC CIRCULATION IN THE SOUTH PACIFIC RESULTS IN A WEAKENING OF UPWELLING AND SIGNIFICANTLY HIGHER SURFACE WATER TEMPERATURES KNOWN AS THE EL NINO PHENOMENON. THE STUDY REPORTED HERE SHOWS A HIGH CORRELATION BETWEEN INCREASED SURFACE WATER TEMPERATURES AND GREATLY INCREASED SUMMER RAINFALL ON THE ADJACENT COASTAL PLAIN. AREAS THAT NORMALLY HAVE LITTLE OR NO RAINFALL WILL HAVE AT LEAST SEVERAL LARGE THUNDERSTORMS DURING A SEASON WITH THE EL NINO PHENOMENON. IT IS SUGGESTED THAT WITH IMPROVED KNOWLEDGE OF ATMOSPHERIC CIRCULATION IT SHOULD BE POSSIBLE TO PREDICT THESE OCCURRENCES. SIMILAR PHENOMENA OCCUR OFF CALIFORNIA, SOUTHWEST AFRICA, AND WESTERN AUSTRALIA.  
(OALS)

NINO/RAINFALL/PERU/CHILE/COASTAL DESERTS/OCEAN CURRENTS/PERU CURRENT/  
AIR CIRCULATION/WATER TEMPERATURE/SUMMER PRECIPITATION/THUNDERSTORMS/  
OALS

9

COLLIER, D.

1955

DEVELOPMENT OF CIVILIZATION ON THE COAST OF PERU. IN J.H. STEWARD, ED.,  
IRRIGATION CIVILIZATIONS: A COMPARATIVE STUDY. SYMPOSIUM ON METHOD AND  
RESULT IN CROSS-CULTURAL REGULARITIES, P. 19-27.

PAN AMERICAN UNION, SOCIAL SCIENCE MONOGRAPH I.

COASTS/SOCIAL ASPECTS/HISTORY

10

COLLIN-DELAUVAUD, C.

1964

CONSECUENCIAS DE LA MODERNIZACION DE LA AGRICULTURA EN LAS HACIENDAS DE LA  
COSTA NORTE DEL PERU (CONSEQUENCES OF MODERNIZATION OF AGRICULTURE ON ESTATES  
ON THE NORTH COAST OF PERU).

MUSEO NACIONAL, LIMA, REVISTA 33:259-282.

GENERAL DESCRIPTION OF ESTATES ON THE NORTH COAST, SUGAR PLANTATIONS AND THEIR  
TECHNICAL TRANSFORMATIONS, INCREASE IN CULTIVATED LAND. SOCIAL CONSEQUENCES;  
EXAMPLE OF A LARGE SUGAR PLANTATION: CARTAVIO. ROLE OF MODERNIZATION AND  
SINDICALISM FOR SOCIAL IMPROVEMENTS. COTTON PLANTATIONS; SOCIAL TRANSFORMA-  
TIONS OF YANACONAS, AGRICULTURAL WORKERS (BOTH PERMANENT AND OCCASIONAL).  
DISAPPEARANCE OF LEASE HOLDERS. REGIONAL AND INTER-REGIONAL SOCIAL CONSE-  
QUENCES. PROLETARIANIZATION OF RURAL MASSES, THEIR DIFFERENTIATION, UNEMPLOYMENT,  
WORK MIGRATIONS.

COASTS/AGRICULTURE/ECONOMIC DEVELOPMENT/SOCIAL ASPECTS/DEMOGRAPHY

11

COLLIN-DELAUVAUD, C.

1968

LES REGIONES COTIERES DU PEROU SEPTENTRIONAL.

INSTITUT FRANCAIS D'ETUDES ANDINES, LIMA. 600 P.

COASTS

12

CRAIG, A.K.

1968

MARINE DESERT ECOLOGY OF SOUTHERN PERU. FINAL REPORT.

FLORIDA ATLANTIC UNIVERSITY, BOCA RATON, DEPARTMENT OF GEOGRAPHY,  
REPORT PARACAS PAPERS 1-2. 215 P. AVAILABLE NTIS AS AD-674 431.

CONTAINS PRELIMINARY RESULTS OF A RECONNAISSANCE CONDUCTED ALONG PART  
OF THE SOUTH-CENTRAL PERUVIAN COAST BETWEEN THE RIO PISCO AND RIO ICA.  
THESE DATA CONSTITUTE THE INITIAL PHASE OF A PROJECT INVOLVING A  
GENERAL SURVEY OF MARINE DESERT ECOLOGY. BROAD OBJECTIVES INCLUDE  
RECONSTRUCTION OF THE LATE PLEISTOCENE PALEOGEOGRAPHIC ENVIRONMENT AND  
ASSEMBLY OF LAND-BASED EVIDENCE FOR PREVIOUS PERU CURRENT DEFLECTIONS.  
CONTEMPORARY PROBLEMS OF HUMAN ECOLOGY ARE ATTACKED AFTER SYSTEMATIC  
REVIEW AND ORGANIZATION OF EXISTING LITERATURE ON GEOLOGY,  
GEOMORPHOLOGY, OCEANOGRAPHY, CLIMATOLOGY, BOTANY, AND ARCHEOLOGY.  
(AUTHOR)

DALS/DESERTS/ECOLOGY/PERU/MARINE GEOLOGY/STRATIGRAPHY/OCEAN CURRENTS/  
FOG/ARCHAEOLOGY/CLIMATOLOGY/PALEOBOTANY/COASTAL DESERTS/OCEAN CURRENTS/  
KWIC MF 7330

13

DOBERITZ, R.

1967

ZUM KUESTENKLIMA VON PERU (COASTAL CLIMATE OF PERU).

HAMBURG, SEEWETTERAMT, EINZELVEROFFENTLICHUNGEN 59. 115 P. MGA  
19.9-10.

CLIMATOLOGICAL OBSERVATIONS OF 2 STATIONS IN THE PERUVIAN COASTAL  
BELT. THE VERY LOW SEA TEMPERATURE OF THE PERU CURRENT IS RESPONSIBLE  
FOR THE LOW ANNUAL AIR TEMPERATURE, THOUGH THE OCCASIONAL PRESENCE OF  
THE EQUATORIAL COUNTERCURRENT KNOWN AS EL NINO MAY INCREASE  
SIGNIFICANTLY. THE NORMALLY WEAK WIND REGIME IS VERY CONSTANT.

PERU/CLIMATIC DATA/COASTAL DESERTS/AIR TEMPERATURE/OCEAN CURRENTS/  
PERU CURRENT/NINO/DALS

14

DOLLFUS, O.

1962

NOTA SOBRE UNA CRISIS CLIMATICA RECIENTE EN EL DESIERTO PERUANO A PARTIR DEL ANALISIS POR C14 DE OSAMENTAS HUMANAS (NOTE ON A RECENT CLIMATIC CRISIS IN THE PERUVIAN DESERT FROM ANALYSIS OF C14 IN HUMAN BONES).

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 38:65-70.

C14 ANALYSIS OF AN OSSUARY DISCOVERED 40 KM FROM LIMA IN THE CHILLON VALLEY GAVE AN AGE OF 3200 YEARS. THIS MIGHT BE LINKED TO A POST-GLACIAL CLIMATIC CRISIS, POSSIBLY A TARDIGLACIAL PERIOD. THE LAST PLUVIAL EPISODE ON THE PERUVIAN COAST COULD BE RELATED TO THE LIMITED RE-ADVANCE OF GLACIAL CONDITIONS, APPROXIMATELY 3000 BP.

CLIMATIC CHANGE/RADIOCARBON DATING/ARCHAEOLOGY/COASTS/PALEOCLIMATOLOGY

15

DOLLFUS, O.

1965

LES ANDES CENTRALES DU PEROU ET LEUR PIEDMONT.

INSTITUT FRANCAIS D'ETUDES ANDINES, LIMA. 404 P.

PEDIMENTS/MOUNTAINS

16

DOLLFUS, O.

1964 - 1965

CAMBIOS CLIMATICOS CUATERNARIOS EN LOS ANDES PERUANOS (QUATERNARY CLIMATIC CHANGES IN THE PERUVIAN ANDES).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 83:65-74, 84:69-83.

GENERAL CHARACTERISTICS OF THE CLIMATE OF PERU ALONG A TRANSECT FROM THE PACIFIC OCEAN (LIMA) TO THE AMAZONAS BASIN. CLIMATIC HISTORY OF THE QUATERNARY AND CONSEQUENCES OF CLIMATIC CHANGES ON RELIEF AND ECOLOGY. RELATION BETWEEN CLIMATIC HISTORY AND HUMAN OCCUPANCY IN THE THREE MAIN SECTORS OF DESERT, MOUNTAIN RANGES AND RAIN FOREST. ACCORDING TO AUTHOR, HUMAN SETTLEMENTS IN PERU ARE AT LEAST TRACEABLE TO THE END OF THE TARDI-GLACIAL CRISIS.

CLIMATE/PALEOCLIMATOLOGY/CLIMATIC CHANGE/QUATERNARY PERIOD/HUMAN'S/DESERTS/ ENVIRONMENTAL EFFECTS/MOUNTAINS/FORESTS/SETTLEMENTS/ARCHAEOLOGY

17

DRESCH, J.

1961

OBSERVATIONS SUR LE DESERT COTIER DU PEROU.

ANNALES DE GEOGRAPHIE 70:179-184.

COASTAL DESERTS

18

DREWES, W.U./DREWES, A.T.

1959

PLAN REGIONAL PARA EL DESARROLLO DEL SUR DEL PERU (REGIONAL DEVELOPMENT PLAN FOR THE PERUVIAN SOUTH).

IMPRESA SERVICIO COOPERATIVO PERUANO NORTEAMERICANO DE EDUCACION, LIMA.  
64 P.

INTRODUCTORY PAPER TO SEVEN REPORTS ON NATURAL RESOURCES. CONTAINS AN ECOLOGICAL CLASSIFICATION AND PHYSICAL DESCRIPTION OF THE PRINCIPAL REGIONS OF SOUTHERN PERU. THE 1955-1957 DROUGHT PERIOD IS ANALYZED IN THE LIGHT OF DEFICIENCIES IN THE METEOROLOGICAL OBSERVATION NETWORK TOGETHER WITH SUGGESTIONS FOR ITS IMPROVEMENT.

NATURAL RESOURCES/PHYSICAL GEOGRAPHY/DROUGHTS/METEOROLOGICAL DATA/ECOLOGY/  
REGIONAL ANALYSIS/PLANNING

19

DROSDOFF, M.

1959

SUELOS DEL SUR DEL PERU (SOILS OF SOUTHERN PERU).

IMPRESA SERVICIO COOPERATIVO PERUANO NORTEAMERICANO DE EDUCACION, LIMA.  
26 P.

SUMMARY OF PUBLICATIONS ON SOILS OF SOUTHERN PERU, WITH A GENERAL MAP, REGIONAL AND SOIL CHARACTERISTICS AND SUGGESTIONS FOR SOIL IMPROVEMENT AND MORE EFFECTIVE WATER UTILIZATION.

SOIL TYPES/SOIL PROPERTIES/SOIL MAPS/SOIL CONSERVATION/SOIL MANAGEMENT/WATER UTILIZATION

20

FUCHS, F.

1937

LOS CAMBIOS DE CLIMA EN EL MUNDO. POSIBLES CAUSAS DEL CAMBIO DE CLIMA EN LA COSTA DEL PERU (CLIMATIC CHANGES IN THE WORLD. POSSIBLE CAUSES OF CLIMATIC CHANGE ON THE PERUVIAN COAST).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 54:159-169.

COASTS/CLIMATIC CHANGE/CLIMATOLOGY

21

GARCIA, C.

1963

LA METEOROLOGIA BAJO LOS INCAS (METEOROLOGY UNDER THE INCAS).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 81:86-89.

REFERENCES TO METEOROLOGICAL KNOWLEDGE OF THE INCAS AND LIST OF QUECHUAN WORDS RELATED TO METEOROLOGY.

METEOROLOGY/HISTORY

22

GAY, P., JR.

1962

ORIGEN, DISTRIBUCION Y MOVIMIENTO DE LAS ARENAS EOLICAS EN EL AREA DE YAUCA A PALPA.

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 37:37-58. BIGENA(31)E67-03633; GA 684-248.

BY STUDYING AERIAL PHOTOGRAPHS IN THE AREA BETWEEN YAUCA AND PALPA ALONG THE COASTAL BELT OF SOUTHERN PERU, THE DIRECTIONS OF MOVEMENT OF THE DUNES WERE ESTABLISHED. TOPOGRAPHIC FEATURES NOTICEABLY DEFLECT THE MOVEMENTS OF THE DUNES BY INTERFERING IN THE PATTERN OF THE PREVAILING WIND DIRECTIONS. THE RELATIONSHIP BETWEEN WIDTH OF THE BARCHANS AND VELOCITY OF MIGRATION IS ESSENTIALLY CONSTANT.

DALS/PERU/COASTAL DESERTS/BARCHANS/DUNES/WIND ACTION/LITTORAL DRIFT/COASTAL TOPOGRAPHIC FEATURES/PERUVIAN DESERT

23

GRAVES, M.E.

1957

ANOMALIAS EN EL TIEMPO DE SUPERFICIE SOBRE LAS COSTAS DEL PACIFICO EN 1955  
(SURFACE WEATHER ANOMALIES ON THE PACIFIC COAST IN 1955).

COMPANIA ADMINISTRADORES DEL GUANO, LIMA, BOLETIN 33(7):5-9.

COASTS/METEOROLOGY/WEATHER PATTERNS

24

HOWELL, W.E.

1965

TWELVE YEARS OF CLOUD SEEDING IN THE ANDES OF NORTHERN PERU.

JOURNAL OF APPLIED METEOROLOGY 4(6):693-700.

CLOUD SEEDING PROGRAM IN THE RIO MOCHE, CHICAMA AND JEQUETEPEQUE AREA,  
TRUJILLO, LED TO AN 8 TO 15 PERCENT INCREASE IN RAINFALL.

CLOUD SEEDING/RAINFALL/METEOROLOGICAL DATA/WEATHER MODIFICATION

25

KESSLER, A./MONHEIM, F.

1966

EL BALANCE HIDROLOGICO DEL LAGO TITICACA. UNA CONTRIBUCION AL APROVECHAMIENTO  
DE SUS AGUAS (HYDROLOGICAL BALANCE OF LAKE TITICACA. A CONTRIBUTION TO THE  
UTILIZATION OF ITS WATERS).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 85:55-65.

CLIMATOLOGY AND HYDROLOGY OF LAKE TITICACA, WATER LEVELS, PRECIPITATION  
AND EVAPORATION. TRIBUTARIES AND OUTFLOW THROUGH THE 'D SAGUADERO':  
HYDROLOGICAL BALANCE.

LAKES/CLIMATOLOGY/HYDROLOGY/WATER UTILIZATION/WATER BALANCE/WATER LEVELS

26

KOSOK, P.

1965

LIFE, LAND AND WATER IN ANCIENT PERU.

LONG ISLAND UNIVERSITY PRESS, NEW YORK. 264 P.

LAND USE/WATER SOURCES/WATER UTILIZATION/SOCIAL ASPECTS/HISTORY/ARCHAEOLOGY/  
PREHISTORY

27

LYNCH, A.M.

1964

CUARENTA AÑOS DE PLUVIOMETRIA (ESTUDIO DEL TIEMPO) (FORTY YEARS OF PLUVIOMETRY, STUDY OF THE WEATHER).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 83161-64.

ANALYSIS OF FORTY YEARS OF CONTINUOUS OPERATION OF THE SAYAPULLO (CAJAMARCA) THERMOPLUVIOMETRIC STATION. MONTHLY AND ANNUAL RAINFALL DATA FOR THE 1924-1963 PERIOD IS GIVEN WITH SPECIAL REFERENCE TO THE ABNORMAL HEAVY PRECIPITATIONS IN 1925.

RAINFALL STATIONS/METEOROLOGY/WEATHER DATA/RAINFALL INTENSITY

28

MALPICA, C.

1966

CRONICA DEL HAMBRE EN EL PERU.

FRANCISCO MONCLOA EDITORES S.A., LIMA. 205 P.

ANALYZES DEFICIENCIES IN NOURISHMENT IN DIFFERENT PARTS OF PERU: RAINFOREST-YUCCA; HIGHLANDS-POTATOES; MOUNTAIN RANGES-CORN; COAST-RICE. DISCUSSES CAUSES AND CONSEQUENCES OF HUNGER.

MALNUTRITION/SOCIAL ASPECTS/HUMANS

29

PERU, DIRECCION GENERAL DE METEOROLOGIA, LIMA

1962 - 1965

BOLETIN CLIMATOLOGICO.

SAME AS AUTHOR.

CLIMATIC DATA

30

PERU, DIRECCION GENERAL DE METEOROLOGIA, LIMA

1967

ANUARIO METEOROLOGICO, 1965.

SAME AS AUTHOR. 127 P. MGA 20.3-34.

CONTAINS TABULATED DATA FOR PRINCIPAL CLIMATOLOGICAL AND PRECIPITATION STATIONS, SYNOPTIC STATIONS, AND SEA WATER- AND SOIL TEMPERATURE-STATIONS. THE TABLES ARE PREFACED BY 4 PAGES OF EXPLANATORY NOTES ON THE UNITS OF MEASUREMENTS AND PROCEDURES USED IN OBSERVING AND MEASURING THE VARIOUS ELEMENTS (PRECIPITATION, TEMPERATURE, HUMIDITY, ETC.).

PERU/METEOROLOGICAL DATA/SYNOPTIC CLIMATOLOGY/SOIL TEMPERATURE/OALS/  
TEMPERATURE MEASUREMENT/WATER MEASUREMENT/HUMIDITY/PRECIPITATION(ATMOSPHERIC)

31

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES (ONERN), LIMA

1967

RESEÑA SOBRE LOS SUELOS, CAPACIDAD DE USO Y AGRICULTURA DE LAS TIERRAS DE LOS DESIERTOS COSTEROS (NOTE ON THE SOILS, THEIR CAPACITY, AND AGRICULTURE OF LAND IN THE COASTAL DESERTS).

COMITE EJECUTIVO PERUANO DE TIERRAS ARIDAS, SYMPOSIUM SOBRE DESIERTOS COSTEROS, LIMA. 29 P.

DESCRIPTION OF SOILS, SOIL CAPACITY AND LAND-USE, ANIMAL HUSBANDRY, FORESTRY AND AGRICULTURE IN IRRIGATED AND NON-IRRIGATED AREAS ALONG THE PERUVIAN COASTS.

LAND USE/SOIL TYPES/AGRICULTURE/FORESTRY/DOMESTIC ANIMALS/COASTAL DESERTS

32

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES (ONERN), LIMA

1969 - 1973

INVENTARIO, EVALUACION Y USO RACIONAL DE LOS RECURSOS NATURALES DE LA COSTA.

SAME AS AUTHOR.

THIS SERIES OF VOLUMES CONTAINS DETAILED BASIC INFORMATION ON THE PHYSICAL (CLIMATE, VEGETATION, GEOLOGY, SOILS, HYDROLOGY) AND HUMAN CHARACTERISTICS OF THE RIVER BASINS ALONG THE PERUVIAN COAST. EMPHASIS IS PLACED ON PRESENT AND POTENTIAL LAND USE AND IMPROVEMENT OF UTILIZATION OF WATER RESOURCES. THE SECOND VOLUME OF EACH STUDY CONTAINS MOSTLY STATISTICAL INFORMATION AND MAPS. 1969: VALLE CHANCAY. 1970: LOS RIOS SAN JUAN (CHINCHA) Y TOPARA; RIO CANETE. 1971: RIO PISCO; RIO ICA; RIO GRANDE (NAZCA). 1972: LOS RIOS FORTALEZA, PATIVILCA Y SUPE; LOS RIOS SANTA, LACRAMARCA Y NEPENA; LOS RIOS CASMA, CULEBRAS Y HUARMEY. 1973: RIO CHICAMA; RIO MOCHE; LOS RIOS VIRU Y CHAO; EL RIO. 1974: LOS RIOS QUILCA Y TAMBO.

RIVER BASINS/LAND USE/WATER RESOURCES DEVELOPMENT/PLANNING/NATURAL RESOURCES/  
PHYSICAL GEOGRAPHY/HUMAN RESOURCES/COASTS

33

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES (ONERN), LIMA,  
INSTITUTO NACIONAL DE PLANIFICACION

1967

DIAGNOSTICO DE LOS RECURSOS NATURALES A NIVEL REGIONAL.

SAME AS AUTHOR. PLAN DE DESARROLLO ECONOMICO Y SOCIAL 1967-1970 1(9). 144 P.

CLIMATIC CHARACTERISTICS OF PERU IN RELATION TO PLANNING REGIONS. SOILS  
AND SOIL CAPACITY. REGIONAL HYDRAULIC RESOURCES, THEIR POTENTIAL AND PRESENT  
UTILIZATION. FORESTS AND FOREST POTENTIAL. MINING RESOURCES AND PRODUCTION.

CLIMATE/SOIL TYPES/WATER RESOURCES/WATER UTILIZATION/FORESTS/MINING/NATURAL  
RESOURCES/PLANNING

34

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES (ONERN), LIMA,  
INSTITUTO NACIONAL DE PLANIFICACION

1974

PRIMER SEMINARIO NACIONAL DE SISTEMAS ECOLOGICOS, RECURSOS NATURALES Y  
MEDIO AMBIENTE.

SAME AS AUTHOR. 28 P.

CONTAINS CONCLUSIONS AND RECOMMENDATIONS OF THE FIRST SEMINAR ON ECOLOGICAL  
SYSTEMS, NATURAL RESOURCES AND THE ENVIRONMENT, WITH RESPECT TO ENVIRONMENTAL  
CONTAMINATION, RENEWABLE NATURAL RESOURCES OF THE OCEAN AND CONTINENTAL WATERS,  
TERRESTRIAL RESOURCES, APPLIED AGRARIAN RESEARCH AND THE ROLE OF ECOLOGY FOR  
DEVELOPMENT PLANNING.

NATURAL RESOURCES/POLLUTION/ECOSYSTEMS/ENVIRONMENT/AGRONOMY/PLANNING

35

PERU, OFICINA REGIONAL DE DESARROLLO DEL NORTE

1969

AGUAS SUBTERRANEAS. VOL. 6.

SAME AS AUTHOR. 78 P.

GEOLOGICAL, HYDROLOGICAL AND HYDROGRAPHIC CHARACTERISTICS OF NORTHWESTERN  
PERU, COASTAL ZONE: ANCASH, LA LIBERTAD, LAMBAYEQUE, PIURA, TUMBES. TOTAL  
GROUNDWATER POTENTIAL.

COASTAL DESERTS/GROUNDWATER/GEOLOGY/HYDROLOGY

36

PETERSEN, G.

1935

ESTUDIOS CLIMATOLÓGICAS DEL NOROESTE PERUANO (CLIMATOLOGICAL STUDIES OF THE NORTHWEST OF PERU).

SOCIEDAD GEOLOGICA DEL PERU, BOLETIN 8(2)1-135.

COVERS CLIMATOLOGICAL KNOWLEDGE OF PERU AT THE TIME WITH A DETAILED ANALYSIS OF CLIMATIC FACTORS AND ELEMENTS. SPECIAL ATTENTION IS GIVEN TO PRECIPITATIONS DURING THE 1924-1932 PERIOD, RAINY AND DROUGHT YEARS AND PALAEOCLIMATES.

CLIMATOLOGY/PALEOCLIMATOLOGY/PRECIPITATION(ATMOSPHERIC)/CLIMATIC DATA/DROUGHTS

37

POPOVICH, Z./TORRES BROUSSET, L.

1966

FLUCTUACIONES DE LA TEMPERATURA EN EL PUERTO CHICAMA EN EL PERIODO 1925-1964 (TEMPERATURE FLUCTUATIONS IN PORT CHICAMA DURING 1925-1964).

SEMINARIO LATINOAMERICANO SOBRE EL OCEANO PACIFICO ORIENTAL, I, LIMA, PROCEEDINGS 167-168.

THE PORT OF CHICAMA IS A POINT OF SURGENCE; MONTHLY AND YEARLY TEMPERATURE CHANGES REFLECT CHANGES DUE TO THE NINO PHENOMENON WHICH BRINGS PARTICULAR CLIMATIC CONDITIONS.

NINO/TEMPERATURE RANGES

38

PSUTY, N.P./BECKWITH, W./CRAIG, A.K.

1968

1000 SELECTED REFERENCES TO THE GEOGRAPHY, OCEANOGRAPHY, GEOLOGY, ECOLOGY, AND ARCHAEOLOGY OF COASTAL PERU AND ADJACENT AREAS. 3D REV.

PARACAS PAPERS 1(1). 52 P. DNR GEOGRAPHY BRANCH CONTRACT N100014-67-A-0320. AVAILABLE NTIS AS AD-671 870.

A SPECIALIZED BIBLIOGRAPHY, ARBITRARILY LIMITED TO 1000 ENTRIES, AND PREPARED TO SERVE CERTAIN NEEDS OF THE INVESTIGATORS ENGAGED IN THIS MARINE DESERT ECOLOGY PROJECT, WAS ASSEMBLED AS A PART OF THE BACKGROUND PREPARATION FOR A LONG-RANGE RESEARCH PROGRAM STUDYING MARINE DESERT ECOLOGY, PARTICULARLY AS IT OCCURS ALONG THE CENTRAL COAST OF PERU. THE ECOLOGY OF THIS COAST OF PERU IS MORE COMPLICATED THAN USUAL BECAUSE THE UNUSUAL FOGGY DESERT ENVIRONMENT IS A REFLECTION OF SOME REMARKABLE NEAR-SHORE CONDITIONS. 4TH REV. APPENDED TO PARACAS PAPERS 1(2), 1968, RECONNAISSANCE REPORT.

KWIC MF 7328/DALS/BIBLIOGRAPHIES/PERU/COASTAL DESERTS/ATACAMA/COASTS/DESERTS/PHYSICAL GEOGRAPHY/ECOLOGY/OCEANOGRAPHY/ARCHAEOLOGY/NEARSHORE FEATURES

39

REPARAZ, G. DE

1954

LA UNESCO Y LA ZONA ARIDA (UNESCO AND THE ARID ZONE).

LITOGRAFIA VALVERDE, LIMA. 12 P.

NOTES ON THE ARID ZONE STUDY PROGRAM OF UNESCO AND ITS PERUVIAN COUNTERPART.  
AIMS AND PROGRAM OF THE PERUVIAN INSTITUTE FOR THE STUDY OF THE ARID ZONE.  
HYDROLOGICAL AND IRRIGATION STUDIES IN AREQUIPA.

UNESCO/HYDROLOGY/IRRIGATION/ARID LANDS

40

REPARAZ, G. DE

1958

LA ZONE ARIDE DU PEROU.

GEOGRAFISKA ANNALER 40. 62 P.

ALTHOUGH THE MAJOR EMPHASIS OF THIS PAPER IS NOT ON CLIMATE, IT DOES CONTAIN  
A DISCUSSION OF THE GENERAL CLIMATIC CONTROLS AFFECTING THE DISTRIBUTION OF  
CLIMATIC ELEMENTS IN THIS PARTICULAR AREA. EMPHASIS IS ON THE COASTAL ZONE,  
WITH PARTICULAR ATTENTION TO THE PHYSICAL AND BIOLOGICAL GEOGRAPHY OF THE  
ARID COAST, WITH BIBLIOGRAPHY.

COASTS/PHYSICAL GEOGRAPHY/BIOGEOGRAPHY/CLIMATOLOGY

41

REPARAZ, G. DE

1960

RAPIDO BOSQUEJO DE ALGUNOS FACTORES CLIMATICOS DE LA ZONA ARIDA PERUANA  
(BRIEF NOTE ON SOME CLIMATIC FACTORS OF THE PERUVIAN ARID ZONE).

COMITE NACIONAL DE PROTECCION A LA NATURALEZA, LIMA, BOLETIN 18:66-75.

CLIMATE OF THE PERUVIAN ARID ZONE AND ITS ANOMALIES, RELATIONSHIP WITH THE  
HUMBOLDT CURRENT. EVAPORATION AND PRECIPITATION ARE COMPARED WITH THOSE IN  
OTHER ARID ZONES. POSSIBLE CAUSES FOR CLIMATIC AND OCEANIC ANOMALIES ARE  
INDICATED.

CLIMATE/ARID LANDS/PERU CURRENT/EVAPORATION/PRECIPITATION(ATMOSPHERIC)/  
CLIMATOLOGY

42

ROSSL, H.

1940

LOS RIOS COSTANEROS DE LOS DEPARTAMENTOS DEL NORTE Y LA INFLUENCIA QUE TIENEN EN ELLOS LOS BOSQUES CISANDINOS (COASTAL RIVERS OF NORTHERN PERU AND THE INFLUENCE OF FORESTS OF THE EASTERN ANDES SLOPES).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 57(3):157-164.

THE FORESTS OF THE ANDEAN SLOPES INFLUENCE THE VOLUME OF DISCHARGE OF COASTAL RIVERS. DESTRUCTION OF FORESTS LEADS TO DECREASE IN STREAMFLOW AND FAVORS SOIL EROSION AND LOSS OF AGRICULTURAL LAND.

COASTS/RIVERS/FORESTS/DISCHARGE(WATER)/STREAMFLOW/SOIL EROSION

43

SCHLOFF, S.L.

1959

PLAN REGIONAL PARA EL DESARROLLO DEL SUR DEL PERU - RECONOCIMIENTO DE LAS AGUAS SUBTERRANEAS (PLAN FOR THE DEVELOPMENT OF SOUTHERN PERU - SURVEY OF SUBTERRANEAN WATER).

IMPRESA SERVICIO COOPERATIVO PERUANO-NORTEAMERICANO DE EDUCACION, LIMA.  
157 P.

SUMMARIZES RESULTS OF GROUNDWATER RESEARCH IN SOUTHERN PERU. POINTS OUT WHERE GOOD QUALITY GROUNDWATER COULD BE FOUND AS WELL AS WHERE GROUNDWATER MIGHT BE IMPOSSIBLE TO OBTAIN OR TOO EXPENSIVE.

GROUNDWATER/GROUNDWATER MINING/WATER RESOURCES

44

SCHOTT, G.

195- ?

LA CORRIENTA PERUANA (THE PERU CURRENT).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 69:3-10.

DESCRIBES INFLUENCE OF THE PERU CURRENT ON CLIMATIC AND ECONOMIC CONDITIONS ON THE COAST.

45

SCHWEIGGER, E.

1959

DIE WESTKUESTE SUEDAMERIKAS IM BEREICH DES PERU-STROMS (THE WESTCOAST OF SOUTH AMERICA IN THE DOMAIN OF THE PERU-CURRENT).

KEYSERISCHE VERLAGSBUCHHANDLUNG, HEIDELBERG-MUNCHEN. 513 P.

PERU CURRENT/COASTS

46

SCHWEIGGER, E.

1961

ANOMALIAS EN EL OCEANO PACIFICO ORIENTAL Y SU PROGNOSTICO (ANOMALIES IN THE EASTERN PACIFIC OCEAN AND THEIR PREDICTION).

SOCIEDAD GEOGRAFICA DE LIMA, BOLETIN 83:3-50.

ANALYZES LINKS BETWEEN RAINFALL AND HYDROGRAPHIC ANOMALIES: ABNORMAL YEARS, PERIODICAL CHANGES, THE PERU CURRENT AND DR. BERLAGE'S PREDICTIONS.

PERU CURRENT/RAINFALL/WEATHER PATTERNS

47

TRICART, J./MAINGUET, H.

1965

CARACTERISTIQUES GRANULOMETRIQUES DE QUELQUES SABLES EOLIENS DU DESERT PERUVIEN; ASPECTS DE LA DYNAMIQUE DES BARCHANES.

REVUE DE GEOMORPHOLOGIE DYNAMIQUE 15(7-9):110-121.

LA DEMONSTRATION EST FAITE QUE LES SABLES EOLIENS MIGRENT DIFFEREMMENT SELON LEURS DIMENSIONS. LES SABLES FINS (< 200 MICRO M) SONT PRIS EN SUSPENSION TOURBILLONNAIRE ET SE CONCENTRENT EN DUNES. LES SABLES MOYENS (200 A 500 MICRO M) SONT, DANS LES BARCHANES, EXPORTES VERS LES AILES, CONTOURNANT DONC LA DUNE; ILS MIGRENT DE CE FAIT PLUS VITE QUE LES PREMIERS, DEPLACES A CONTRE PENTE, CONTRAIREMENT A CE QUI SE PRODUIT DANS LES ESPACES INTERDUNAIRES. LES GRAINS GROSSIERS MIGRENT PAR REPTATION - ROULAGE ET DONNENT DES RIDES.

EOLIAN SOILS/BARCHANS/SANDS/DUNES

48

U.S. WEATHER BUREAU, WASHINGTON, D.C.

1955

BIBLIOGRAPHY ON THE CLIMATE OF PERU.

SAME AS AUTHOR. 13 P. AVAILABLE NTIS AS AD-670 031.

THE DOCUMENT LISTS 45 REPORTS BY TITLE AND AUTHOR AND INCLUDES DESCRIPTIVE COMMENTS. INFORMATION ON CLIMATOLOGY, METEOROLOGY, DIURNAL VARIATIONS, RAINFALL, HUMIDITY, VAPOR PRESSURE, ARTIFICIAL PRECIPITATION, UPPER ATMOSPHERE AND WIND IS GIVEN.

DAIS/BIBLIOGRAPHIES/CLIMATOLOGY/PERU/METEOROLOGY/DIURNAL/RAINFALL/HUMIDITY/ARTIFICIAL PRECIPITATION /WIND(METEOROLOGY)/KWIC MF 7321

49

WEBERBAUER, A.

1944

CLIMA Y VEGETACION EN LOS ANDES DEL PERU Y SU TERRITORIO COSTANERO (CLIMATE AND VEGETATION OF THE PERUVIAN ANDES AND ITS COAST).

UNIVERSIDAD NACIONAL MAYOR DE SAN MARCOS, LIMA, FACULTAD DE CIENCIAS, REVISTA DE CIENCIAS 46(448):167-182.

CLIMATE/VEGETATION/COASTS/MOUNTAINS

50

WEBERBAUER, A.

1944

LA INFLUENCIA DE LOS CAMBIOS CLIMATICOS Y GEOLOGICOS SOBRE LA FLORA DE LA COSTA PERUANA (INFLUENCE OF CLIMATIC AND GEOLOGICAL CHANGES ON THE FLORA OF THE PERUVIAN COASTS).

ACADEMIA NACIONAL DE CIENCIAS EXACTAS, FISICAS Y NATURALES, LIMA, ACTAS 7(3):7-10.

COASTS/FLORA/CLIMATIC-VEGETAL RELATIONSHIPS/CLIMATIC CHANGE/GEOLOGY

51

WYRTKI, K.

1973

TELECONNECTIONS IN THE EQUATORIAL PACIFIC OCEAN.

SCIENCE 180(4081):66-68.

STRONG TRANSPORT IN THE EQUATORIAL COUNTERCURRENT CONTRIBUTES TO 'EL NINO'. SEA-LEVEL DIFFERENCES ACROSS THE COUNTERCURRENT APPEAR TO BE WELL CORRELATED WITH SEA-SURFACE TEMPERATURE ANOMALIES OFF CENTRAL AMERICA. ANOMALOUS PERIODS IN OCEANIC AND ATMOSPHERIC CLIMATE CORRESPOND TO HIGHEST DIFFERENCES E.G. IN DECEMBER 1957 WHEN SEA-LEVEL DIFFERENCE WAS 0.50 M AND TEMPERATURE +1.0 DEGREES C., EL NINO APPEARED IN PERU. TRANSPORT OF WARM WATERS OF THE COUNTERCURRENT HAS TO BE CONTINUOUSLY HIGH OVER A PERIOD OF 3 MONTHS OR MORE.

NINO/OCEAN CURRENTS/WATER TEMPERATURE/CENTRAL AMERICA/CLIMATE

52

ZAMORA, C.

1974

LOS SUELOS, USO Y PROBLEMAS DE LAS TIERRAS ARIDAS DEL PERU (SOILS: UTILIZATION AND PROBLEMS OF PERU'S ARID LANDS).

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES, LIMA. 18 P.

DESCRIBES DIFFERENT TYPES OF SOILS IN THE PERUVIAN COASTAL DESERT, THEIR UTILIZATION AND PROBLEMS OF PERU'S ARID LANDS.

COASTAL DESERTS/SOIL TYPES/LAND USE

53

ZAMORA, C.

1974

REGIONES DE USO DE LA TIERRA DEL PERU (LAND-USE REGIONS OF PERU).

PERU, OFICINA NACIONAL DE EVALUACION DE RECURSOS NATURALES, LIMA. 20 P.

LAND-USE REGIONS OF PERU. DESCRIPTION OF DIFFERENT LAND-USE IN DESERT AND SEMI-ARID REGIONS ON THE COAST, MOUNTAIN SLOPES, VALLEYS AND HIGHLANDS, AND DIFFERENT REGIONS OF THE AMAZONAS BASINS.

LAND USE/COASTAL DESERTS/MOUNTAINS/BASINS

54

ZUTA, S.

1972

EL FENOMENO 'EL NINO' (THE 'EL NINO' PHENOMENON).

REVISTA DE ESTUDIOS DEL PACIFICO (5):27-42.

DESCRIPTION OF GENERAL OCEANIC CONDITIONS IN THE SOUTHEASTERN PACIFIC AND ITS CURRENTS. THE 'EL NINO' PHENOMENON IS CONSIDERED TO BE OCCASIONAL, IRREGULAR AND APERIODICAL. REFERENCES TO MECHANISMS OF ITS FORMATION AND ITS CONSEQUENCES.

OCEAN CURRENTS/NINO

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## VENEZUELA

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AGUILERA, J.A.

1969

LA CLASIFICACION BIOCLIMATICA DE H. GAUSSEN Y F. BAGNOULS Y SU APLICACION EN VENEZUELA (H. GAUSSEN AND F. BAGNOULS' CLIMATIC CLASSIFICATION AND ITS APPLICATION TO VENEZUELA).

VENEZUELA, MINISTERIO DE OBRAS PUBLICAS, CARACAS, DIRECCION DE CARTOGRAFIA NACIONAL. 42 P.

PRESENTS THE APPLICATION OF THE BIOCLIMATIC METHOD OF GAUSSEN AND BAGNOULS TO VENEZUELA. FOUR CLIMATIC ZONES ARE DEFINED. THIS CLIMATIC CLASSIFICATION UTILIZES NOT ONLY TEMPERATURE, PRECIPITATION, AND VEGETATION AS CLIMATIC INDICATORS BUT ALSO MAKES USE OF FOG AND DEW.

BIOCLIMATOLOGY/CLIMATIC ZONES/CLIMATOLOGY/TEMPERATURE/FOG/DEW/PLANT INDICATORS/PRECIPITATION(ATMOSPHERIC)

2

AGUILERA, J.A.

1970

DISTRIBUCION ESTACIONAL Y ESPACIAL DE LA PLUVIOSIDAD EN VENEZUELA (SEASONAL AND SPATIAL RAINFALL DISTRIBUTION IN VENEZUELA).

VENEZUELA, MINISTERIO DE OBRAS PUBLICAS, CARACAS, DIRECCION DE CARTOGRAFIA NACIONAL.

BASED ON DATA FROM 60 PLUVIOMETRIC STATIONS IN VENEZUELA, ANALYZES SEASONAL AND SPATIAL RAINFALL DISTRIBUTION. THE RESULTING 24 PLUVIOMETRIC PROVINCES ARE REPRESENTED ON TWO COLORED MAPS ACCOMPANIED BY OMBROTHERMIC DIAGRAMS FOR REPRESENTATIVE STATIONS.

RAINFALL STATIONS/WEATHER PATTERNS/RAINFALL/WEATHER DATA

3

CHAVES, L.F.

1963

GEOGRAFIA AGRARIA DE VENEZUELA (AGRARIAN GEOGRAPHY OF VENEZUELA).

UNIVERSIDAD CENTRAL DE VENEZUELA, CARACAS. 297 P.

ANALYZES THE PHYSICAL GEOGRAPHY AND THE PROBLEM OF THE NATURAL RESOURCES OF VENEZUELA AND THEIR INTERRELATIONS WITH AGRARIAN PROBLEMS.

PHYSICAL GEOGRAPHY/NATURAL RESOURCES/AGRICULTURE

4

EWEL, J.J./MADRIZ, A.

1968

ZONAS DE VIDA EN VENEZUELA (LIFE ZONES IN VENEZUELA).

VENEZUELA, MINISTERIO DE AGRICULTURA Y CRIA, CARACAS, DIRECCION DE INVESTIGACION. 265 P.

PHOTOGRAPHIC COVERAGE OF VENEZUELA'S VEGETATION EXPOSES RESULTS OF ECOLOGICAL STUDIES USING HOLDRIDGE'S METHOD FOR CLASSIFICATION OF VEGETATIONAL ZONES, A METHOD THAT WILL BE APPLIED TO VENEZUELA WITH THE AIM OF ECOLOGICAL MAPPING.

LIFE ZONES/PHYTOGEOGRAPHY/PHOTOGRAPHY/VEGETATION/PLANT ECOLOGY

5

FREILE, A.

1963

METEOROLOGIA Y CLIMATOLOGIA TROPICAL Y DE VENEZUELA (TROPICAL AND VENEZUELAN METEOROLOGY AND CLIMATOLOGY).

VENEZUELA, MINISTERIO DE DEFENSA, CARACAS, SECCION DE GEOGRAFIA. 429.

DETAILED DISCUSSION OF THE DYNAMICS OF THE VENEZUELAN CLIMATE.

CLIMATE/CLIMATOLOGY/METEOROLOGY

6

FREILE, A.

1969

REGIONES CLIMATICAS DE VENEZUELA (CLIMATIC REGIONS OF VENEZUELA).

EDITORIAL SUCRE, CARACAS.

A REGIONAL CLIMATOLOGY OF VENEZUELA, COMPARING THORNTHWAITE'S METHOD WITH KOEPPEN'S CLASSIFICATION.

ARIDITY INDEX/CLIMATIC ZONES/CLIMATOLOGY/KOEPPE'S CLIMATIC CLASSIFICATION/ THORNTHWAITE, C.W.

7

PEETERS, L.

1968

ORIGEN Y EVOLUCION DE LA CUENCA DEL LAGO DE VALENCIA (ORIGIN AND EVOLUTION OF THE LAKE VALENCIA BASIN).

VENEZUELA, MINISTERIO DE AGRICULTURA Y CRIA, CARACAS. 66 P.

DISCUSSES THE GEOMORPHIC HISTORY OF THE VALENCIA BASIN. HEAVY INDUSTRIAL CONCENTRATION IN THE BASIN HAS PRODUCED ENVIRONMENTAL PROBLEMS BECAUSE OF INADEQUATE USE OF THE RENEWABLE NATURAL RESOURCES AND LACK OF CONTROL OVER INDUSTRIES.

LAKE BASINS/GEOMORPHOLOGY/ENVIRONMENTAL IMPACT/ECONOMIC DEVELOPMENT

8

RIEHL, H.

1973

CONTROLS OF THE VENEZUELAN RAINY SEASON.

AMERICAN METEOROLOGICAL SOCIETY, BULLETIN 54(1):9-13.

RAINFALL PATTERNS AND CLIMATIC VARIABILITY ARE RELATED TO THE POSITION OF THE EQUATORIAL CONVERGENCE ZONE. IF THE ITCZ IS RESTRICTED TO THE SOUTH, HEAVY PRECIPITATION CONCENTRATES THERE AND THE CENTER AND NORTH IS RELATIVELY DRY. RAINFALL IN THESE AREAS IS CONNECTED WITH THE UPPER EASTERN AIRFLOW. CONCENTRATION OF RAINFALL OCCURS IN NARROW CONVERGENCE ZONES MOVING WEST AT 800 KM/DAY.

RAINFALL/WEATHER PATTERNS/ATMOSPHERIC CIRCULATION/RAINFALL INTENSITY

9

RUDOLFO CORTES, S.

1952

EL MEDIO FISICO VENEZOLANO (VENEZUELA'S PHYSICAL ENVIRONMENT).

TALLERES SOROCAIMA, CARACAS. 137 P.

AN INTRODUCTION TO THE PHYSICAL GEOGRAPHY OF VENEZUELA, LANDFORMS, NATURAL REGIONS SOILS, VEGETATION, AND FAUNA.

PHYSICAL GEOGRAPHY/LANDFORMS/SOIL TYPES/ANIMAL POPULATIONS/VEGETATION

10

TRICART, J.

1974

APPORTS DES PHOTOGRAPHIES ERTS-1 A NOTRE CONNAISSANCE ECOGENETIQUE DES LLANOS DE L'ORENOQUE (COLOMBIE ET VENEZUELA).

EUROPEAN SPACE RESEARCH ORGANIZATION, SPECIAL PUBLICATION 100:317-324.

DES CHAMPS DE DUNES SE SONT MIS EN PLACE, ALIMENTES PAR LES ALLUVIONS DE LA BASSE-TERRASSE AU MOMENT OU ELLE S'EDIFIAIT. ILS ATTEIGNENT 4 DEGRES DE LAT. N ET SE TERMINENT LA POUR DES RAISONS LITHOLOGIQUES ET TOPOGRAPHIQUES. ILS ONT ETE EDIFIES PAR DES VENTS DU NE, PENDANT LA DERNIERE GLACIATION.

DUNES/WIND ACTION

11

TRICART, J./MICHEL, M.

1965

MONOGRAPHIE ET CARTE GEOMORPHOLOGIQUE DE LA REGION DE LAGUNILLAS (ANDES VENEZUELIENNES).

REVUE DE GEOMORPHOLOGIE DYNAMIQUE 15(1-3):1-33.

CARTE HORS-TEXTE EN COULEURS AU 1/25.000 D'UN FOSSE D'EFFONDREMENT AYANT CONTINUE DE FONCTIONNER AU QUATERNAIRE, CARACTERISE PAR UN CLIMAT D'ABRI SUBARIDE. ACCUMULATIONS QUATERNAIRES MISES EN PLACE SOUS L'EFFET COMBINE DE LA TECHTONIQUE ET D'OSCILLATIONS CLIMATIQUES. ETUDE DES PROCESSUS ACTUELS.

GEOMORPHOLOGY/TECTONICS/CLIMATIC GEOMORPHOLOGY/QUATERNARY PERIOD

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