UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Mineral Production (1900-1977) of the Sherbrooke-Lewiston 1°x2° Quadrangles; Maine, New Hampshire, and Vermont

by

Walter J. Bawiec[1]

Open-File Report 84-752

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

[1]U.S. Geological Survey
Reston, Virginia

Introduction

The U.S. Geological Survey has been engaged in the Conterminous United States Mineral Appraisal Program to assess the mineral potential of selected 1° x 2° quadrangle map areas throughout the United States. Among these selected areas are the Sherbrooke and Lewiston 2° quadrangles which occur in Maine, New Hampshire, and Vermont and the Charlotte 2° quadrangle which occurs in North and South Carolina (DeYoung et al., 1984). As a byproduct of the resource assessment of these areas, the previous mineral production of these states was investigated to gain an understanding of the mineral endowment of each state and to put possible future development into proper perspective.

A comprehensive understanding of the history of an area's mineral production, including its diversity, magnitude, and spatial distribution is very important in estimating its resource endowment and can serve as a background for long-range planning. These attributes of individual commodities and aggregates of related commodities can be applied to endeavors such as the estimation of mineral and energy reserves or resources, exploration potential, supply analysis, future land-use planning, and policies on development (Gabert, 1978).

One of the primary steps in studying and understanding the mineral production of an area is to develop an inventory. This is accomplished by first documenting all production by fields of interest such as commodity, year, and area. To do this, consistant and complete records of production must be available. The next step is to disaggregate this information into workable units or subsets of interest. This information can then provide a means to investigate in detail many attributes of the mineral production industry; these can include specific information about commodities and production trends or insight into resources, land-use planning, and exploration potential.

The design of the data set to document mineral production resulted in a unique and functional compilation of data. Although original numbers for production weights and values were recorded as reported, these have been converted into either metric tons or grams (precious materials) and 1967 U.S. dollars. This use of standardized units permits the investigation of areas by either individual commodity or groups of diverse commodities and their possible comparison with other areas. Information concerning the amount and value of production for specific areas and commodities can be used to show the spatial distribution and magnitude of production over an area and can aid in answering the following questions:

What is the distribution of total production (metric tonnes) or value (1967 U.S. dollars) over a region?

What is the distribution of production of each commodity over a region?

What areas have little or no production?

What areas have contributed most towards production?

What is the value of land being withheld from production?

Can the spatial distribution of production be used to delineate future areas for exploration?

How is production related to the geology of an area?

Can a knowledge of production patterns influence land use planning?

From these questions, it is apparent that a comprehensive knowledge of the mineral production history of an area is important and can make a valuable contribution towards decisions regarding the future development of an area.

Mineral Production Data

The U.S. Bureau of Mines has a program to monitor production activity for each commodity within the United States. This is accomplished by canvassing all companies known to be involved in mineral production and requesting their voluntary response to a questionnaire of pertinent information. This information includes the annual tonnages and values of production, which remains confidential if requested.

The mineral data used in this study was collected from the annual production records of the U.S. Bureau of Mines which were reported by individual operators. This report includes all records from the early 1900's through 1977. Much of this information has been published on an annual basis by the U.S. Geological Survey, 1880-1923, and the U.S. Bureau of Mines, 1924-1977. However, some of the annual data is withheld to maintain the confidentiality of proprietary data. This confidentially of annual production is preserved in this study by aggregating every year of production. Compiling this mineral production data resulted in over 4,000 records being encoded into a computer file.

Each record of mineral production collected consists of five fields: Commodity name and code, year of production, producing county, production amount, and production value.

I. Commodity name and code - A three-digit commodity code (fig. 1) identifies each commodity and is used to group related commodities into five commodity groups (Labovitz et al., 1977). The five commodity groups and their respective commodity codes are as follows:

Construction materials	100-199
Fuels	200-299
Metals	300-399
Nonmetals	400-499
Precious materials	500-599

Each commodity with reported production is identified with an "X" in fig. 1. When this "X" is circled, production of this commodity comes

from county which intersects the Sherbrooke-Lewiston 1° x 2° quadrangles.

II. Year of production - Each record consists of the annual production that commodity.

III. Producing county - Each record was collected on a county basis when possible. Otherwise, this number was attributed to the "undistributed" category.

IV. Production amount - All units of production were standardized into either metric tons (construction materials, fuels, metals, nonmetals) or grams (precious materials).

V. Production value - All values of production were standardized into 1967 U.S. dollars in order to have a basis of constant dollars for comparison for all commodities, years and areas.

Once the annual production data were encoded into the computer, an examination of the data was performed to detect keypunching errors, missing years, or anomalous values. Although encoding errors of this type can be easily checked and eliminated, dealing with the following data problems inherent in this type of data set are more difficult: proprietary data that cannot be released, nonreporting, missing production and/or value figures, errors in reporting and recording, production before or after the study period (pre-1900, post 1977), and production not keyed to a specific area.

The use of proprietary data in this study was not a problem because the release of information was restricted only on an annual basis. All previous production was standardized and aggregated by commodity into one number.

Nonreporting by a company or missing production and/or value figures were problems more difficult to resolve because it could not be determined if production was lacking for a specific year or if it just was not recorded. Hence, there may be gaps in the production data. A listing by county of the commodities produced and their years of reported production can be found in Bawiec (1983, appendix 3). In some instances, there is continuous production of data with intermittent gaps of a few years in which it would be very easy to estimate missing amounts. However, this process of including interpolated estimates could lead to biases in the data set. Therefore, only the information reported to the U.S. Bureau of Mines and contained in its files was used in this study.

Errors in reporting and in recording the amount of production or its value were evaluated by time-series analysis of both variables. If the tonnage or the per unit value of a commodity increased or decreased suddenly, this record was reexamined for accuracy. Production before or after the study period was not considered here. In most cases, production figures (before 1900) are unknown and if production is reported, it is not consistant throughout the state.

To deal with production which was not keyed to a specific county, the "undistributed" category was created for accounting purposes. Some of the production records, especially from earlier years, were not reported on a county

basis but by individual operator. If the operator and production could not be assigned to a specific county, they were entered under "undistributed." Also, if production figures for a specific county were available, but the remaining production of the commodity could not be assigned to other counties in the state for that particular year, this remaining production was entered as "undistributed." In other instances, production figures were reported only as state totals. In this case, production information could not be disaggregated into counties and was recorded as "undistributed." Because this process does not allow for double counting all counties are exclusive.

The amount of state production not assigned to individual counties was relatively small when compared to other errors or biases which were already present in the raw data. Such biases consisted mostly of omissions in reporting production information to the U.S. Bureau of Mines. For this reason, estimates of the production presented in this paper are likely to be quite conservative.

Unit Regional Analysis of Mineral Production Data

The analysis of an area using the unit regional method requires several steps. First, the annual records of quantity and value of production for each commodity at the regional area size of interest must be compiled from available sources. These data must then be computerized and checked for errors of duplication, omission, and keypunching. After being validated, the production units are transduced into standard units of metric tons or grams (precious materials). This value of production is converted into 1967 U.S. dollars in order to have constant dollars through time and to compare precious materials with other commodity groups. Once the annual records of production and value have been standardized, the unit regional value (U.R.V.) of a commodity can be found by summing the values for that commodity over time and dividing by the area of the region under consideration to yield 1967 U.S. dollars per square kilometer. The unit regional weight (U.R.W.) of a commodity for an area can be found by summing the production of that commodity over time and dividing by the area of the region under consideration (metric tons per square kilometer). Griffiths (1978) developed a technique to estimate the resources of underdeveloped areas by using the log-normal distribution of U.R.V. of the more developed or productive areas. Here, the U.R.V. is used as a basis of comparison to delineate areas of high productivity by commodity. Although this may be intuitive to economic geologists and mineral economists who are knowledgeable about the mineral production of an area, the U.R.V. concept provides a reproducible, quantitative, and objective method to measure the degree of productivity or development of various commodities (Labovitz and Griffiths, 1982).

In computing the U.R.V. and U.R.W. of the total state, the production data from the "undistributed" county was included (fig. 3). When examining the U.R.V. on the county basis, "undistributed" county was excluded for the following reasons: the production information could not be disaggregated into the individual counties and no significant error would be introduced because the proportion not assignable was so small.

Spatial Distribution of Production

Examination of the U.R.V. by county of selected commodities reveals a spatial pattern of production with respect to the distribution and the intensity of production. Because production has been dominated by the construction materials and nonmetallic commodities, highly productive areas are greatly influenced by the location of population centers and the infrastructure of major highways. Economics has played a large role in county production of construction materials and nonmetals because, due to transportation costs, it is cheaper to explore, develop, and produce sand and gravel deposits locally than to import them from other counties. Also, trends of production appear to coincide with lithologic and structural geologic features of the states such as tectonism or the extent of glacial deposits. Figure 3 shows the U.R.V. for total production of all commodities by county. Shaded counties represent areas producing higher than the average U.R.V. for each state. A pattern can be observed that shows the greatest production occurring along a northeast trend, coincident with a combination of population centers, highway infrastructure, and geologic structure.

Observation of the distribution of production from several counties implies that spatial patterns do exist in many areas. Whatever the factors for the distribution of production, the concept that these patterns are real and can be a valuable guide to future exploration or development is important. The spatial distribution of production from individual commodities gives perspective to past production and insight into possible areas of future exploration or production for that commodity.

Summary and Conclusions

A comprehensive understanding of the mineral production history of an area is a prerequisite for such planning and decisionmaking processes as estimating resources, directing future exploration, developing land-use plans, and formulating state policies on development. A viable method by which to gain this understanding consists of: establishing a rational data base which documents production with respect to commodity, year, and county, and interrogating this data base to produce derivative products that can be used by government (administration) and industry (exploration).

Characteristics of the mineral industry, which previously had been only qualitative or intuitive, can now be expressed quantitatively. The dominance of construction materials and nonmetals to the mineral industry and the relatively small contribution by metals, precious materials (gold, silver) and fuels are established. It is now possible to examine each commodity group or individual commodity and to quantify the impact of each on the mineral industry. Each county's contribution towards the total value of state production also can be examined. The spatial distribution of production was examined by comparing the U.R.V. (1967 U.S. dollars per square kilometer) by county. These figures delineate the highest producing counties in the Sherbrooke-Lewiston 1° x 2° quadrangles and also demonstrate the spatial distribution and magnitude of production for each commodity by county.

Mineral inventories and the U.R.V. concept can make an important, if not a mandatory, contribution to the information base required by both government and

industry decisionmakers. The true value of this type of study, however, will be determined only by the user community and only if a study of this type is utilized. The validity and reliability of the data base and this kind of study require that these steps be taken to serve as input for resource assessments and to act as the background from which all future decisions will be made.

References Cited

Bawiec, Walter J., 1983, The unit regional value of the mineral resources of Maine, New Hampshire and Vermont, M.S. thesis, The George Washington University, Washington, D.C.

Bawiec, Walter J. and Turner, R. M., 1983, The distribution of the value of mineral production in Maine, New Hampshire and Vermont, Northeastern Section of Geological Society of America, March 23-25, 1983, Kiamesha Lake, N.Y.

DeYoung, J. H., Jr., Lee, M. P., and Dorian, J. P., 1984, Mineral map for the Charlotte 1° x 2° quadrangle, North Carolina and South Carolina: U.S. Geological Survey Misc. Investigations Map I-1251-W.

Gabert, G., 1978, The importance of mineral and energy inventories, Journal of the International Association for Mathematical Geology, v. 10, no. 5, p.425-432.

Griffiths, John C., 1978, Mineral resource assessment using the unit regional value concept, Journal of the International Association for Mathematical Geology, v. 10, no. 5, p. 442-472.

Labovitz, M. L., and Griffiths, J. C., 1982, An inventory of undiscovered Canadian mineral resources, National Aeronautics and Space Administration Technical Memo. 83890, Greenbelt, Md.

U.S. Bureau of Mines, 1924-1933, Mineral resources of the United States, Dept. of Commerce, Washington, D.C.

U.S. Bureau of Mines, 1933-1977, Mineral Yearbooks, Dept. of the Interior, Washington, D.C.

U.S. Geological Survey, 1880-1923, Mineral resources of the United States, Dept. of the Interior, Washington, D.C.

Maine	N Hamp	Vermont	Commodities	Maine	N Hamp	Vermont	Commodities
			Construction Materials				
		(X)	101 Asbestos				320 Thorium
(X)	(X)	X	103 Clays (Construction)				321 Tin
X	(X)		104 Diatomite				322 Titanium
	X		105 Gypsum				323 Tungsten
(X)	(X)	X	106 Mica				324 Vanadium
(X)	(X)	(X)	107 Sand and Gravel	X	(X)		325 Zinc
(X)	(X)	(X)	108 Stone				326 Zirconium
			110 Vermiculite				Nonmetals
			Fuels				401 Aluminum Silicates
			201 Anthracite Coal				402 Barytes
			202 Asphalt				403 Borates
			203 Bituminous Coal				404 Bromine
			204 Lignite				405 Carbon Dioxide
			205 Liquid Propane Gas	(X)		X	406 Clays (Nonmetal)
			206 Natural Gas				407 Corundum
			207 Natural Gasoline	(X)	(X)	X	408 Feldspar
			208 Oil Shale		X		409 Fluorspar
X	X	X	209 Peat		(X)	X	410 Garnet
			210 Petroleum	(X)	(X)	X	411 Gemstones
			211 Uranium				412 Graphite
			Metals	(X)	(X)	(X)	413 Lime and Limestone
			301 Aluminum			X	414 Magnesite
			302 Antimony				415 Mineral Paints
			303 Arsenic				416 Nitrates
(X)	(X)		304 Beryllium				417 Phosphates
			305 Bismuth				418 Potassium Salts
			306 Cadmium			X	419 Pyrites
			307 Chrome				420 Salt
		X	308 Cobalt	(X)	(X)	X	421 Sand (Nonmetal)
X	(X)	X	309 Copper				422 Soda
			310 Iron Ore			X	423 Sulfur
X	(X)		311 Lead			X	424 Talc
(X)			312 Lithium				426 Abrasives
			313 Magnetite				427 Calcareous Marls
		X	314 Manganese				Precious Materials
			315 Mercury				501 Diamonds
			316 Molybdenum	X	(X)	X	502 Gold
		X	317 Nickel				503 Platinum
			318 Rare Earths	X	(X)	X	504 Silver
			319 Tantalum				

X = Production within state.

(X) = Production within the counties that intersect the boundary of the Sherbrooke-Lewiston 1°x2° quadrangles.

Figure 1.-- The 75 standard commodities used in the unit regional values studies.

Figure 1. The diversity of the mineral production from each state is shown on this list of 75 standard commodities. Maine has produced 18 different commodities, New Hampshire 19 commodities, and Vermont, the most diversified, has produced 22 different commodities. Circled commodities indicate production from states whose counties intersect the Sherbrooke-Lewiston 1° x 2° quadrangles. The diversities of each state are based upon reported production, no matter how small the tonnage and values or how few the years of production. Hence, commodities with very limited value, i.e., one year's production, are present and considered a resource. These 75 commodities have been subdivided into 5 commodity groups based upon their nature and use.

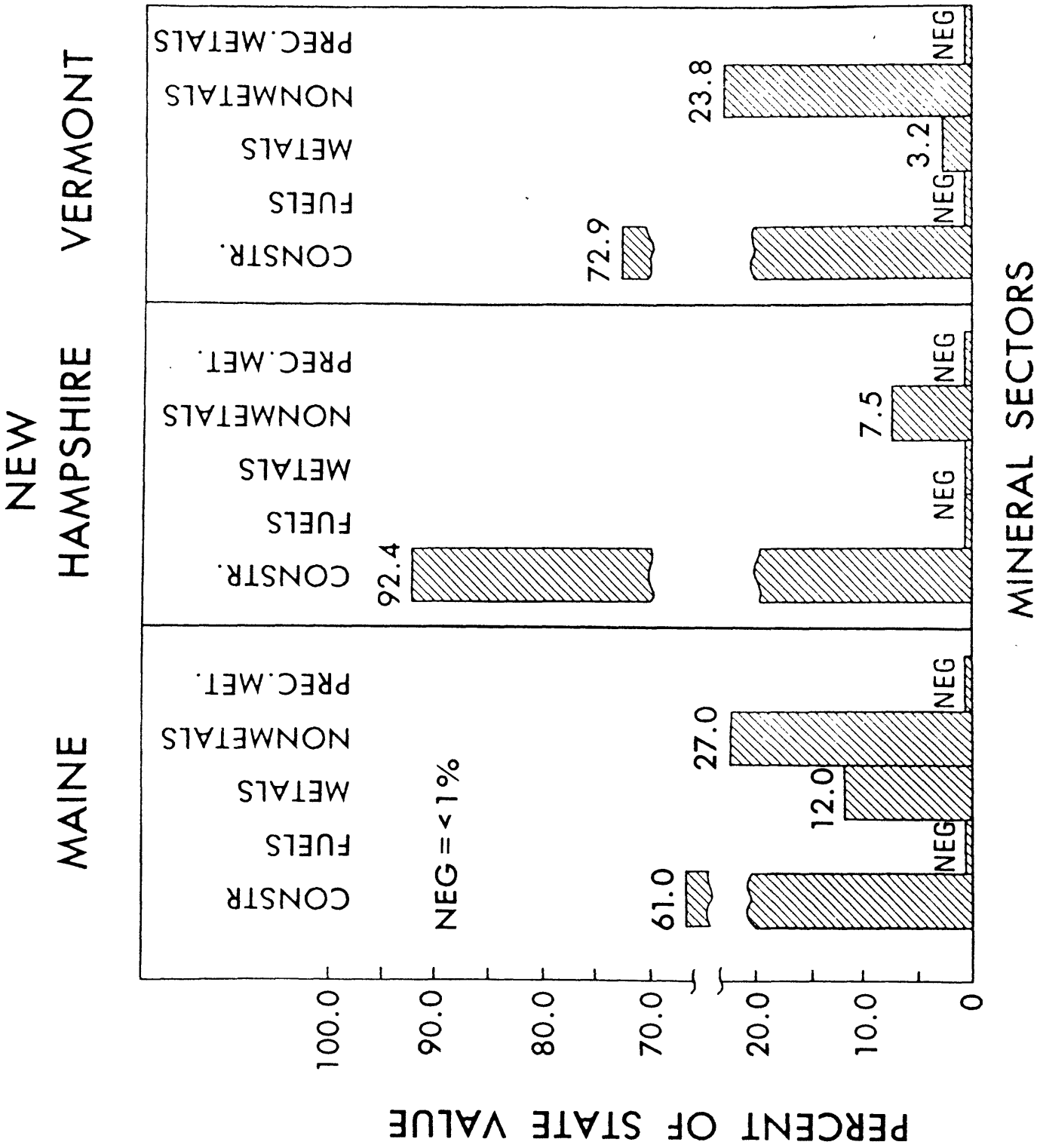
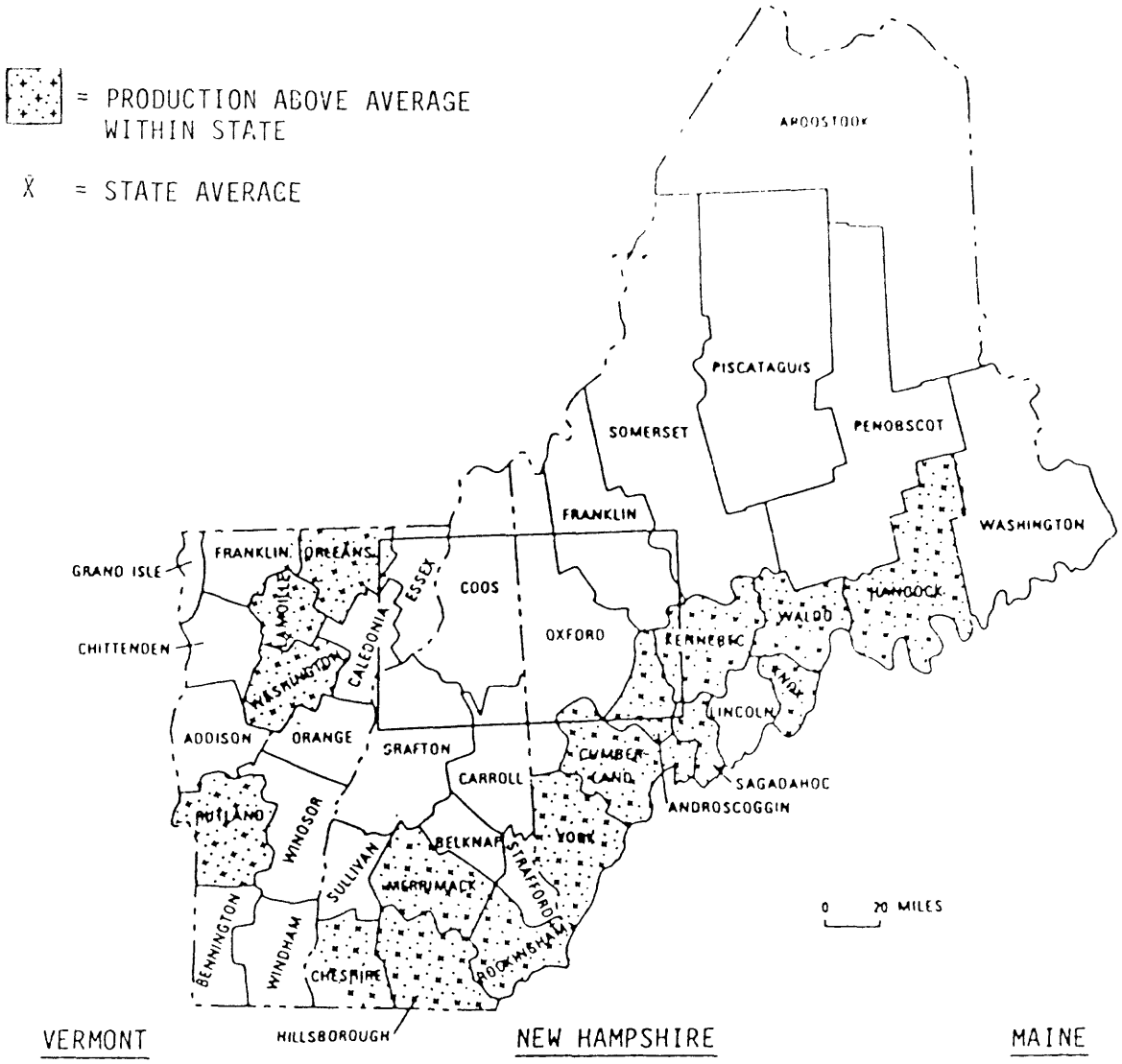


Figure 2.--Distribution of mineral production by commodity group within state.

Figure 2. The cumulative value of mineral production (1967 U.S. dollars) by commodity group has been computed for each state. The importance of each of these commodity groups toward the total value of production for each state can be ascertained by its relative proportion of production. In all three states, construction materials and nonmetals dominate the value of production, with metals also being of importance in Maine. The contribution of fuels and precious materials towards the total value of production in all three states is negligible.

TOTAL PRODUCTION - ALL COMMODITIES



VERMONT

COUNTY	URV (1967$/km^2)
ESSEX	1712
BENNINGTON	3994
WINDHAM	5752
CALEDONIA	6136
GRAND ISLE	8525
ADDISON	8892
FRANKLIN	14056
WINDSOR	17238
CHITTENDEN	21711
ORANGE	34396
X̄ = 36712	
ORLEANS	43371
LAMOILLE	68003
WASHINGTON	97134
RUTLAND	126477

NEW HAMPSHIRE

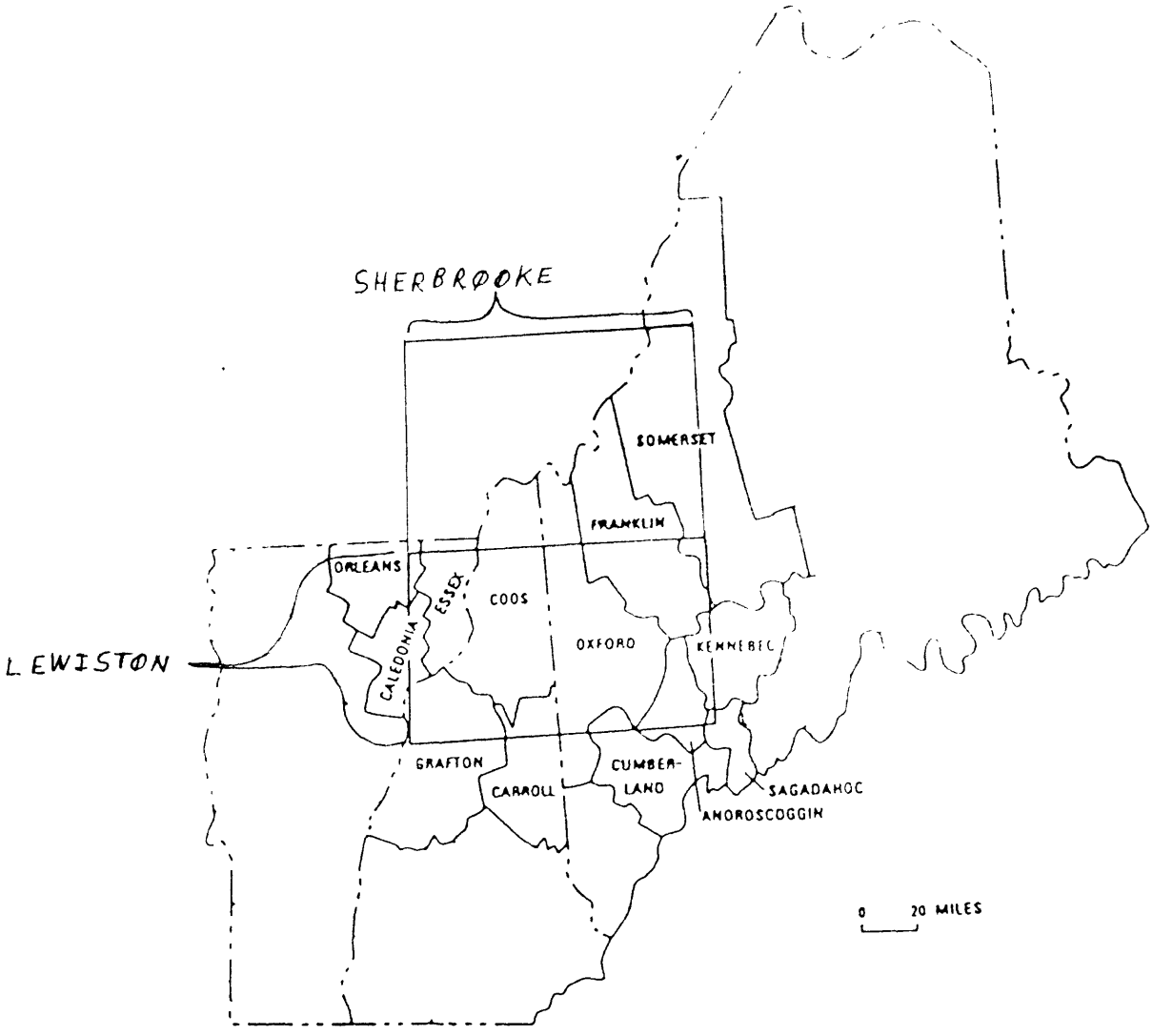
COUNTY	URV (1967$/km^2)
COOS	1301
SULLIVAN	2810
CARROLL	3519
GRAFTON	3883
STRATFORD	7239
BELKNAP	9445
X̄ = 9933	
CHESHIRE	11918
MERRIMACK	18749
HILLSBOROUGH	20009
ROCKINGHAM	20571

MAINE

COUNTY	URV (1967$/km
PISCATAQUIS	571
SOMERSET	635
FRANKLIN	911
WASHINGTON	939
AROOSTOOK	1059
LINCOLN	1821
OXFORD	2074
PENOBSCOT	2427
X̄ = 4771	
WALDO	6856
YORK	7435
SAGADAHOC	8712
KENNEBEC	9574
ANDROSOGGIN	13085
CUMBERLAND	15207
HANCOCK	18140
KNOX	84957

Figure 3.--Total production of all commodities by county in Maine, New Hampshire, and Vermont: 1900-1977.

Figure 3. The distribution of the value of total production within each state, by county, is shown. Shaded counties have unit regional values (URV)* higher than the state average. Computing the state averages independently allows for the fact that each state has different mining and tax laws, a different commitment to development, and different environmental concerns. Areas with relatively higher values of production correlate with population density, highway and railroad infrastructure, and geology. The counties that intersect the boundary of the Sherbrooke and Lewiston 1° x 2° quadrangles are underproduced with respect to the counties lying outside the boundary. *Unit regional value (URV) - see text for explanation.

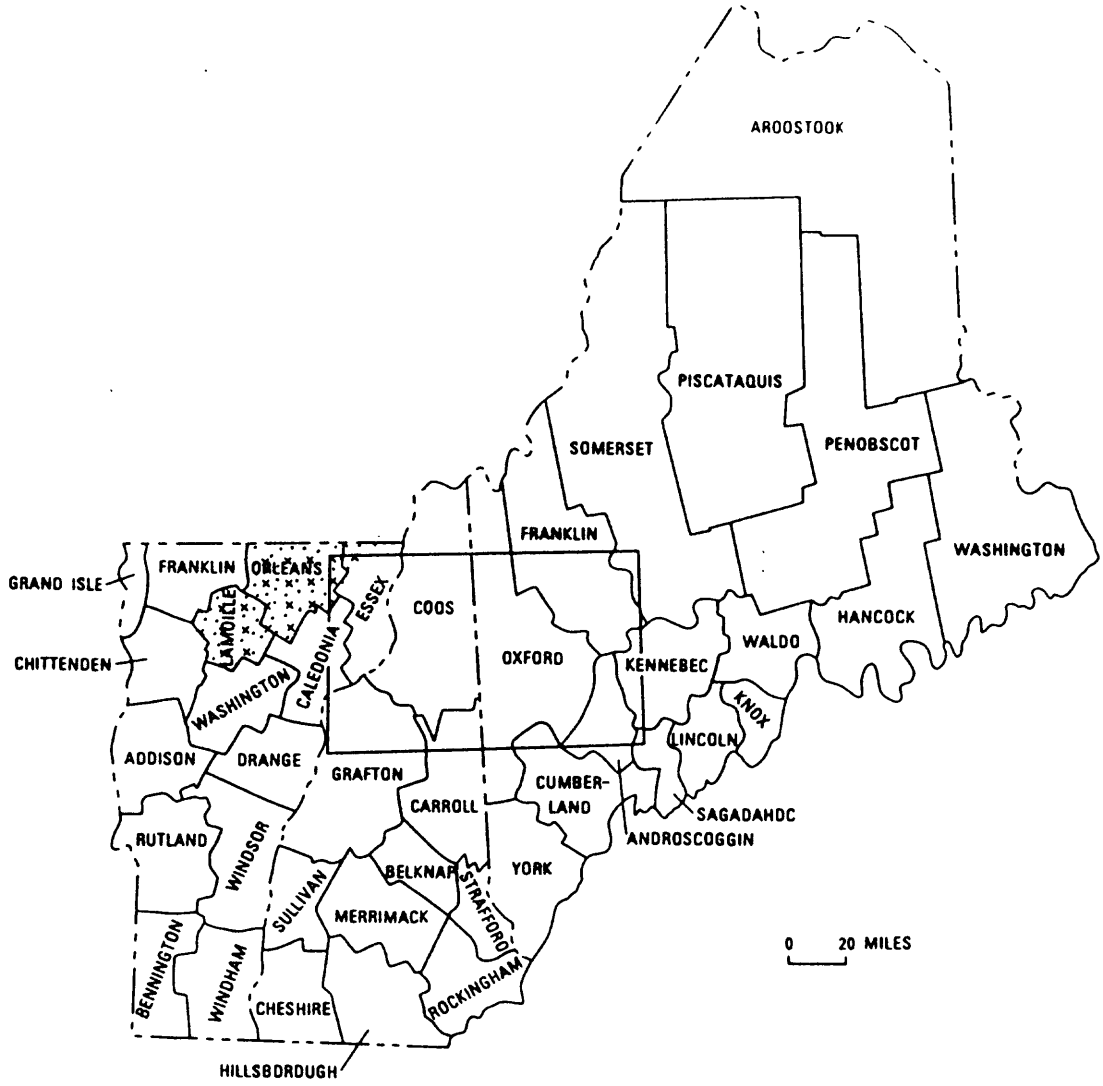


VERMONT		NEW HAMPSHIRE		MAINE	
COUNTY	URV (1967$/km^2)	COUNTY	URV (1967$/km^2)	COUNTY	URV (1967$/km^2)
ESSEX	1712	CARROLL	3519	ANDROSCOGGIN	13085
CALEDONIA	6136	COOS	1301	CUMBERLAND	15207
ORLEANS	43371	GRAFTON	3883	FRANKLIN	911
				KENNEBEC	9574
				OXFORD	2074
				SAGADAHOC	8712
				SOMERSET	635

Figure 4.-- Counties of the Sherbrooke-Lewiston 1°x2° quadrangles

Figure 4. This study will concern itself with the thirteen counties that intersect the boundary of the Sherbrooke and Lewiston 1° x 2° quadrangles. The counties of the northwest (Orleans - 43,371 1967 U.S. $/km^2) and southeast (Cumberland - 15,207 1967 U.S. $/km^2, Androscoggin - 13,085 1967 $/km^2) corners of the Lewiston 1° x 2° quadrangles are the most productive with the highest unit regional values of the counties involved (fig 3). The least productive of the counties which are contained within these quadrangles comprise the eastern half of the Sherbrooke 1° x 2° sheet and the northeastern corner of the Lewiston 1° x 2° sheet. They are Somerset (635 U.S. 1967 $/km^2) and Franklin (911 U.S. 1967 $/km^2) Counties, Maine. Each commodity, which has been produced within the 13 counties of the Sherbrooke-Lewiston 1° x 2° quadrangles, is examined below, showing both the spatial distribution and magnitude (tonnage and value) of production by county in all three states. Counties, within states, are listed by ascending unit regional values. Counties reporting production have been shaded. The commodities are listed by the major groups described earlier.

ASBESTOS (101)

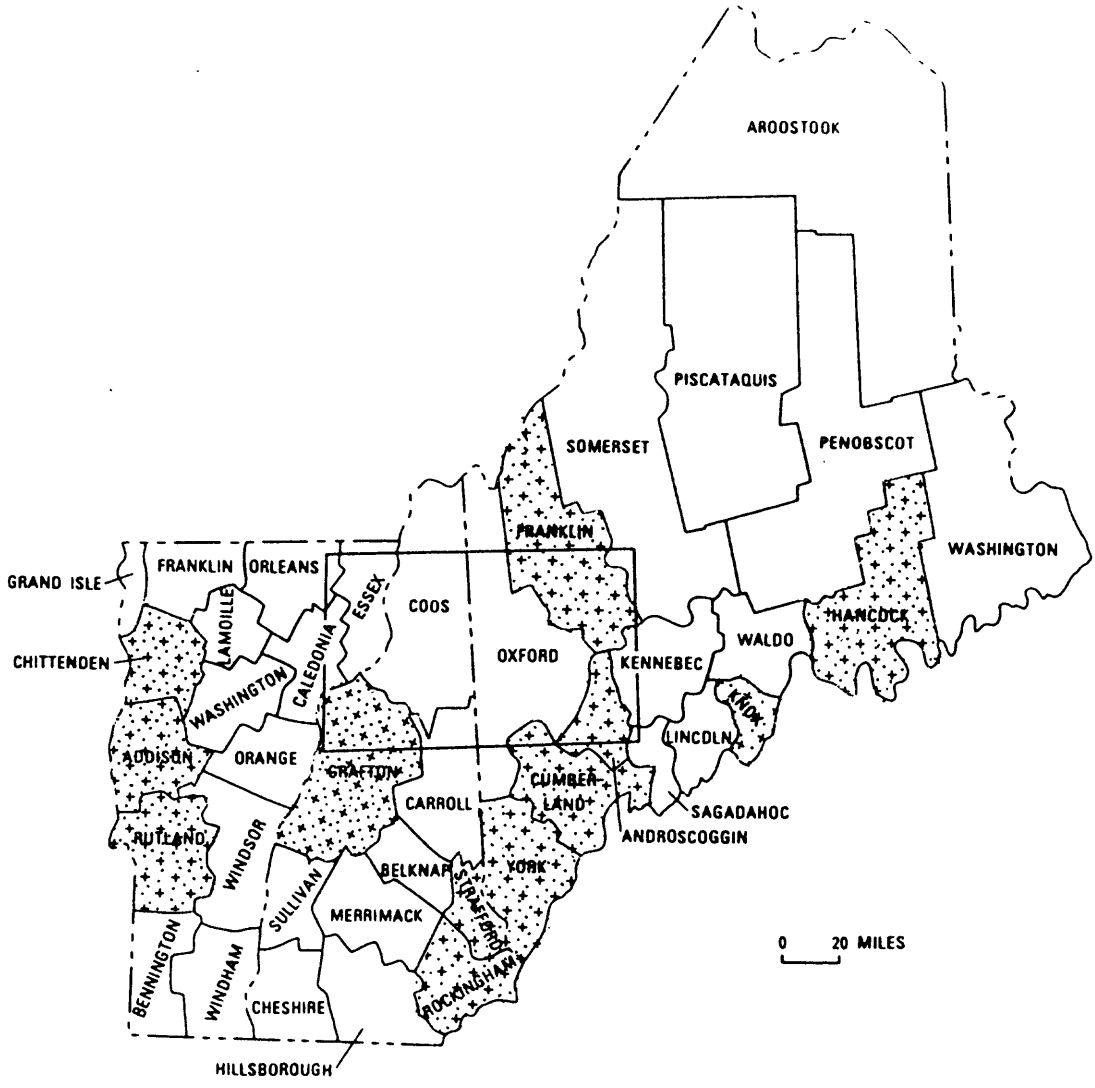


Asbestos 101

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
VERMONT				
Orleans	1908-12, 57-59, 61-77	741048	75789242	40926
Lamoille	1922, 30-59	708393	55738236	45402

Asbestos (101) - Production of asbestos has occurred within two counties of Vermont; Lamoille and Orleans. These deposits are considered to be the southward extension of similar deposits which occur in Quebec, Canada. They are mined by open pit and consist of chrysotile asbestos veins which occur in massive serpentine. This product contains 25 grades which are based on length and quality of fibre.

CLAY - CONSTRUCTION MATERIAL (103)

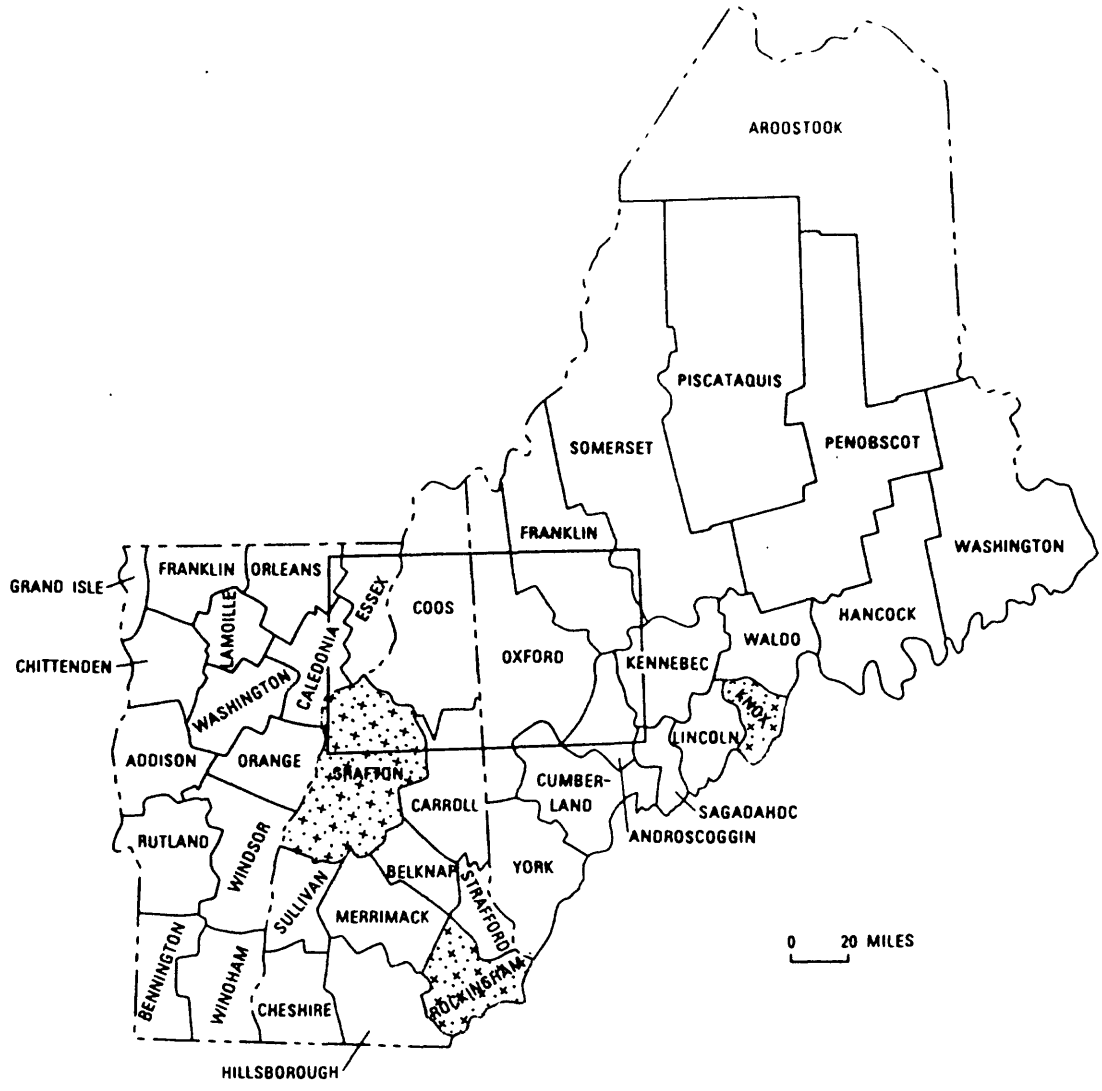


Clay-Construction Material 103

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1961-62, 64, 66-77	431	1191	0.30
Franklin	1960-61	1007	1468	0.33
York	1960-65	9265	13291	5.13
Androscoggin	1933-37, 39, 60-77	274636	279073	227.26
Knox	1974-77	317336	268074	280.41
Cumberland	1960-77	400467	654704	287.53
Undistributed	1954-59	148715	177609	2.22
NEW HAMPSHIRE				
Grafton	1960-70, 72-74	133329	136279	30.38
Rockingham	1950, 60-70, 72-76	299167	269515	150.57
Strafford	1963-70, 72-77	158290	272365	279.64
Undistributed	1954-59	178475	241997	10.34
VERMONT				
Rutland	1960	595	1383	0.58
Chittenden	1960, 63-70	71214	73916	53.56
Addison	1961-67	9141	175810	86.56
Undistributed	1954-55, 57-59	60169	78423	3.27

Clay - Construction Material (103) - Production of clay - construction material consists of common miscellaneous or mixed clay for bricks and cement. It has been produced from four counties which fall within the Sherbrooke-Lewiston 2° quadrangle; Androscoggin, Cumberland, and Franklin Counties, Maine; Grafton, New Hampshire. These clays are glacial lake or glacial marine deposits.

DIATOMITE (104)

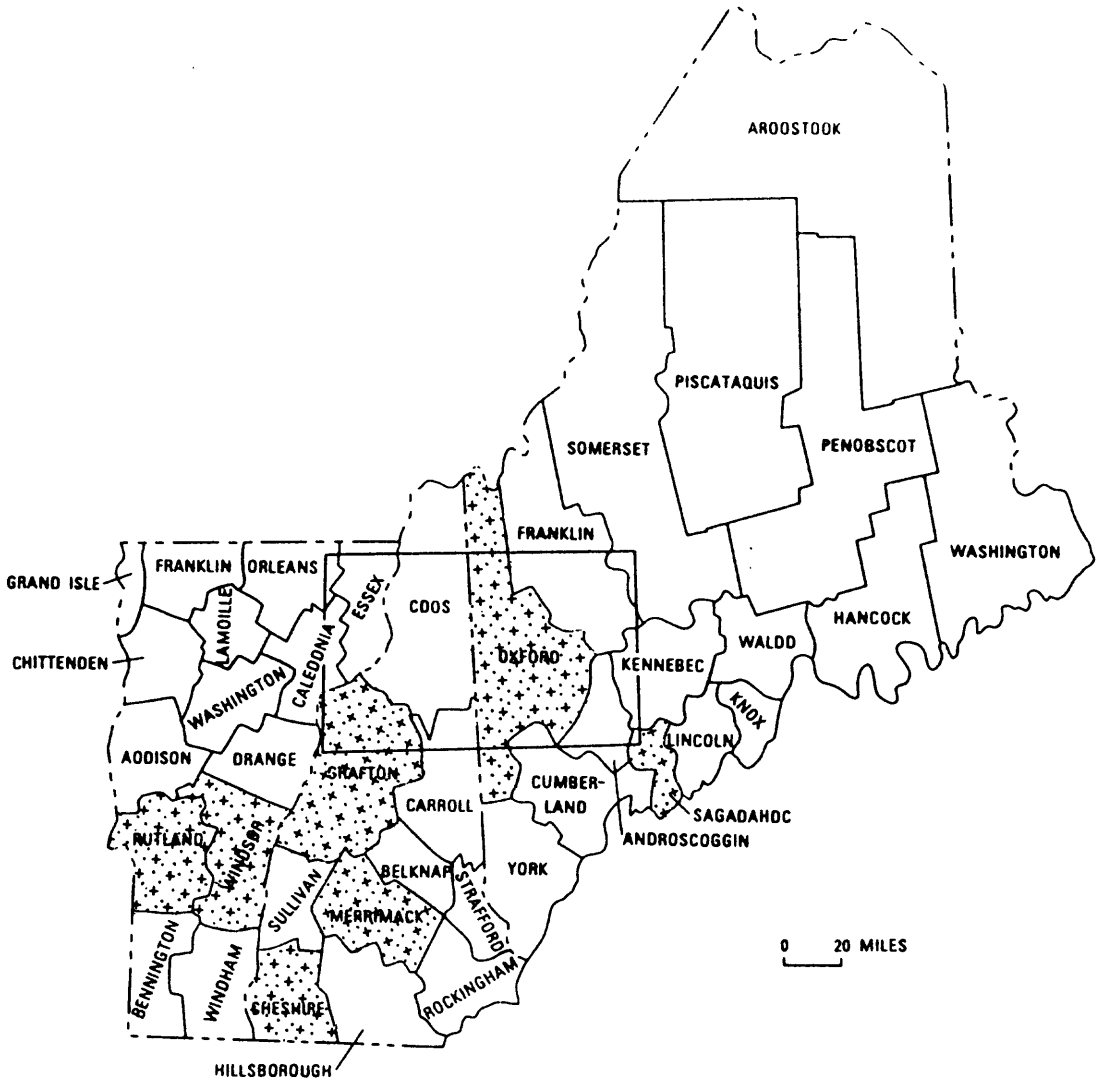


Diatomite 104

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Knox	1969-77	63100	3880537	4059.14
NEW HAMPSHIRE				
Grafton	1925, 27-29, 39	393	43292	9.65
Rockingham	1959-77	22514	976076	545.29
Undistributed	1930	9	1458	0.06

Diatomite (104) - Production of diatomite (Grafton, N.H.) or perlite (Knox, ME; Rockingham, N.H.) is reported for three counties, one of which lies within the 2° quadrangle, Grafton, N.H. These commodities have been both produced within these counties, and imported and processed. A potential deposit of diatomaceous earth lies beneath Umbagog Lake (80 feet thick x 8,000 acres).

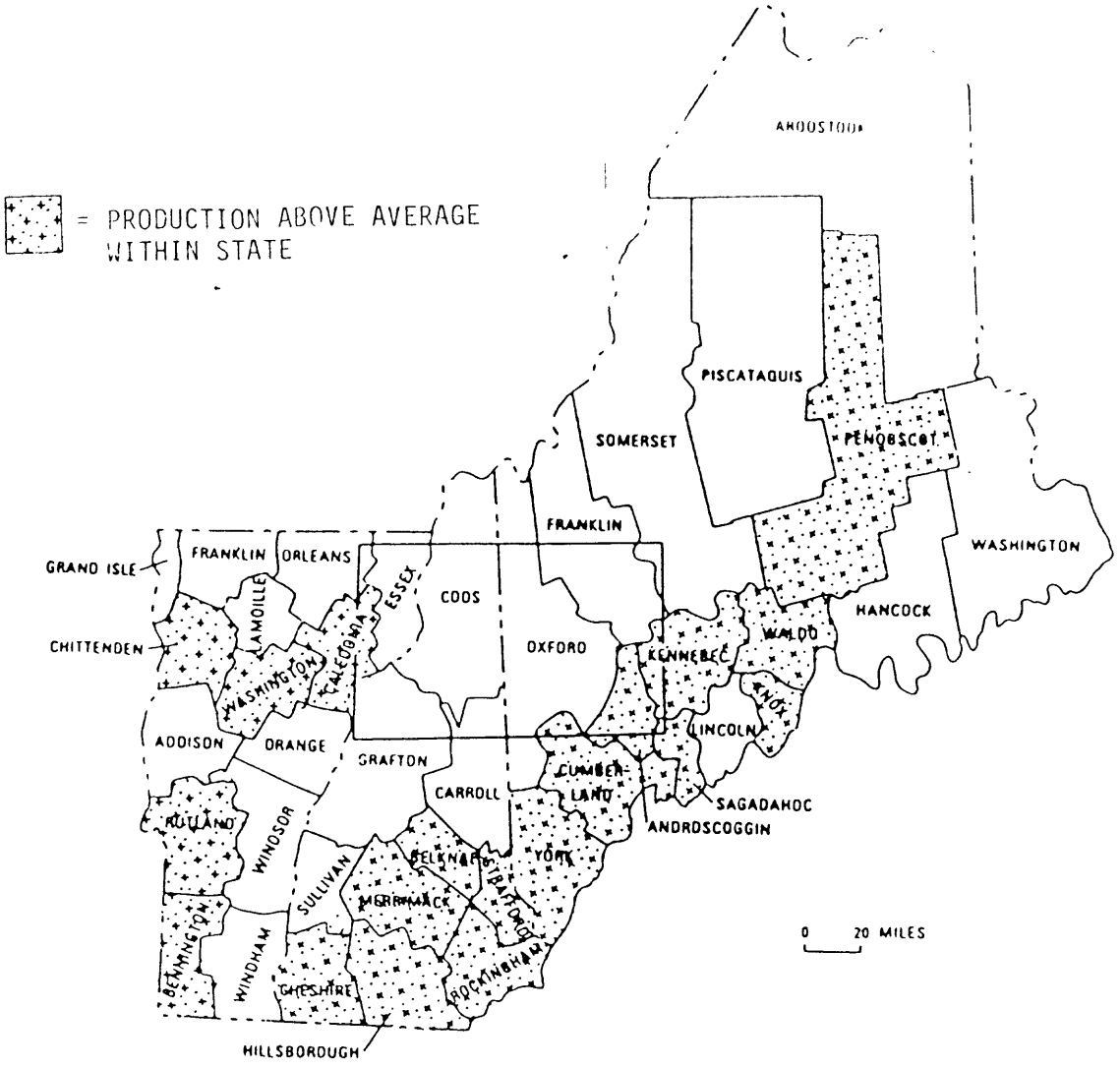
MICA (106)


AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
KENNEBEC
OXFORD
COOS
ESSEX
CALEDONIA
LAMOILLE
FRANKLIN
ORLEANS
GRAND ISLE
CHITTENDEN
WASHINGTON
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
KNOX
LINCOLN
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
SULLIVAN
BELKNAP
MERRIMACK
STRAFFORD
YORK
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBOROUGH
0 20 MILES

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Sagadahoc	1960, 62	0.9	173	0.26
Oxford	1960, 62	9651	23294	4.32
Undistributed	1953-58	446	910542	11.37
NEW HAMPSHIRE				
Cheshire	1925, 60-62, 69-70	692	243143	131.29
Grafton	1925, 60-62, 67, 69-70	2966	1218610	271.65
Merrimack	1960, 64, 70-74	6020	1828490	759.02
Undistributed	1924, 26-43, 53, 57-58, 75	16672	4731504	202.21
VERMONT				
Rutland	1932	354	9955	4.15
Windsor	1940-42	766	19557	7.83

Mica (106) - Production of mica includes sheet and scrap production from seven counties, three of which fall within the Sherbrooke-Lewiston 2° sheets; Oxford and Sagadahoc, Maine; Grafton, New Hampshire. First production of area reported from Ruggles Mine, Grafton, New Hampshire (1803). Sheet and scrap mica production is a byproduct of feldspar mining, which occurs in pegmatites. Variability in price per ton is related to the proportion of sheet versus scrap mica.

SAND AND GRAVEL (107)

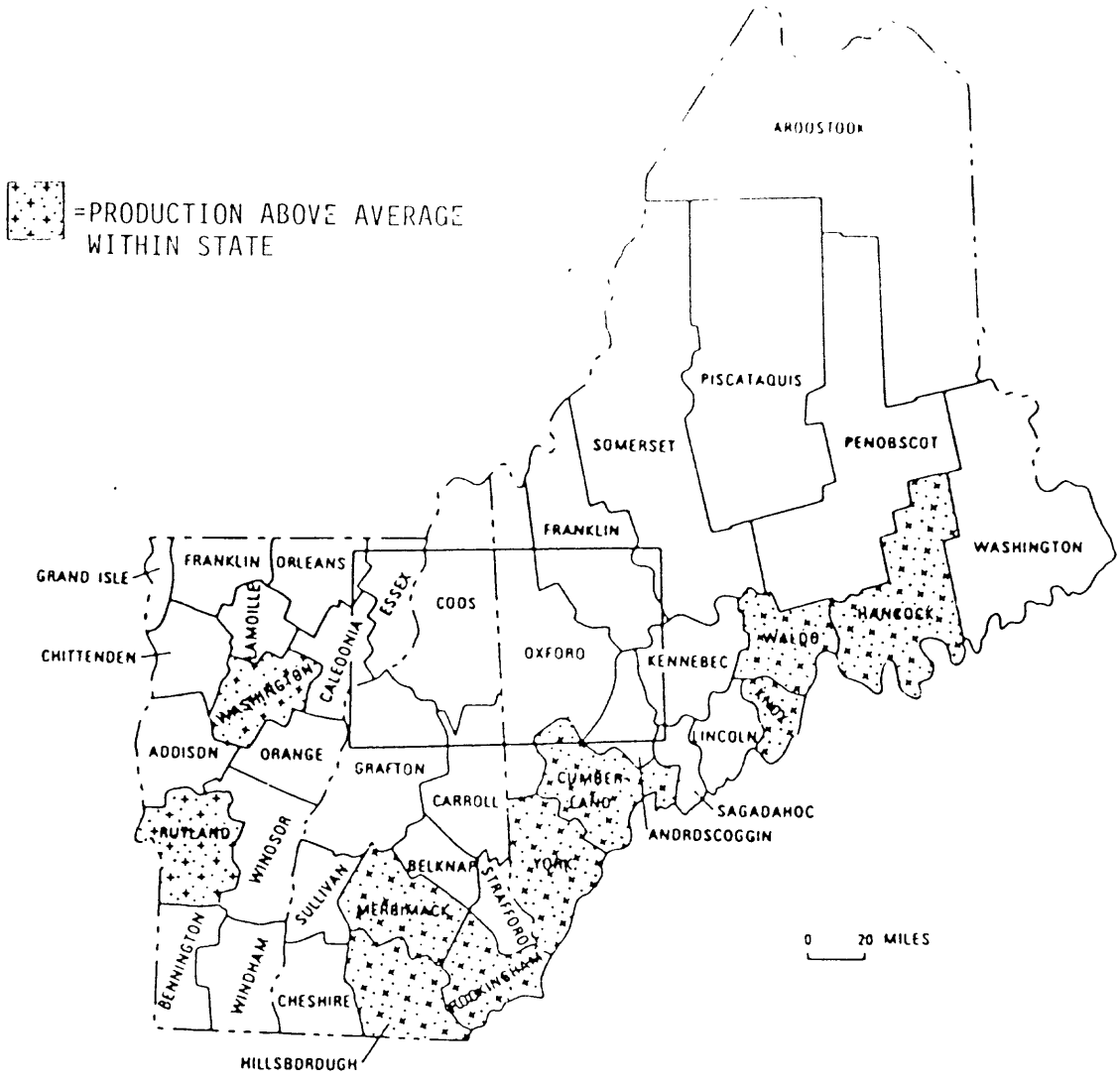


State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE*		281776193	154666729	1930.51
Piscataquis	1932, 55-77	5561660	2645034	261.65
Washington	1936-37, 40, 42-44, 46-51, 53-77	8245180	3817095	577.04
Somerset	1943, 47, 51, 53-77	11819987	5946313	589.62
Oxford	1927, 47-51, 53-77	8226337	3776415	700.37
Aroostook	1932-34, 44, 48, 53-77	25267073	12555307	710.70
Franklin	1938-42, 48-51, 53-77	6974416	3873476	875.16
Hancock	1927, 35-38, 40-58, 60-77	9452424	5406371	1358.04
Lincoln	1955-58, 60-73, 75-77	4358375	2136842	1817.04
Penobscot	1925, 27-30, 32-33, 35-77	35269544	20375658	2320.69
Waldo	1932, 36-46, 48-50, 53-70, 72-77	8112228	5093914	2668.37
Sagadahoc	1935-43, 54-73, 75-77	4099534	1979265	2971.87
York	1935, 43, 54-77	13983321	9147933	3527.93
Knox	1937-38, 40-42, 49, 55-77	5542981	3660907	3829.40
Cumberland	1932, 35, 40-77	27097397	17304274	7599.59
Kennebec	1935-77	36181572	17487610	7744.73
Androscoggin	1935-77	18940354	15115848	12309.32
Undistributed	1931, 33-44, 46-50, 60, 62, 65-71,73-74	5264383810	24344467	303.86
NEW HAMPSHIRE*		173398586	126051717	5387.06
Coos	1946, 48, 54-77	7207040	4907792	1041.11
Sullivan	1956-63, 65-77	4256921	2566654	1838.58
Grafton	1932, 35-37, 39-40, 42, 45-51, 54-77	13580042	9337048	2081.37
Carroll	1954-77	7865384	7330501	3017.91
Rockingham	1955-77	16247030	9717674	5428.87
Hillsborough	1935-42, 51, 53-77	18078834	15247561	6592.11
Strafford	1936, 42, 51, 54-77	9128111	6752069	6932.31
Cheshire	1935-51, 53-77	12285177	13501631	7290.30
Belknap	1939-40, 42-43, 49-50, 53-77	10985086	9753541	9414.61
Merrimack	1945-51, 53-77	35106184	27573552	11446.06
Undistributed	1923-31, 33-50, 60, 63-72	38658777	19363694	827.54

VERMONT*		63064038	55827877	2325.10
Grand Isle	1955, 58, 60-62, 66, 75	109390	59654	277.46
Addison	1948-50, 52-61, 63-72, 74-77	2719562	1705802	840.30
Orange	1942, 44-50, 52, 54-72, 74-77	2749931	1593696	891.83
Franklin	1935-39, 41-44, 46-50, 54-72, 74-77	2610608	1913416	1119.61
Windham	1936-37, 42-50, 52-72, 74-77	3000952	2679525	1314.78
Lamoille	1943-50, 52-77	1995178	1673722	1364.08
Orleans	1954-72, 74-77	3279790	2649457	1430.59
Windsor	1950, 52-72, 74-77	6247952	3699420	1480.36
Essex	1939, 42, 55-64, 66-72, 74-77	2601375	2926954	1704.69
Washington	1926-30, 35, 41-50, 52-72, 74-77	6704367	4317741	2358.13
Rutland	1932-50, 52-72, 74-77	5863518	5991944	2495.60
Bennington	1950, 52-72, 74-77	5275704	5888165	3384.00
Caledonia	1932, 46-47, 50, 52-72, 74-77	4523665	5687174	3588.12
Chittenden	1937, 39, 43, 45-50, 52-72, 74-77	7311705	7448365	5397.37
Undistributed	1931, 33-51, 60-65 69-70	9185800	9745486	405.88

* County totals do not sum to state totals because undistributed production summed into state totals.

Sand and Gravel (107) - Production of sand and gravel has occurred from all forty counties of Maine, New Hampshire, and Vermont. This wide distribution results from the remnants of a continental ice sheet that blanketed the area. Production is used in concrete, bituminous mixtures, road bases and fill. This is one of the most important commodities of New England. Due to high transportation costs, the production of sand and gravel is dependent on population centers and highway and railroad infrastructure. Production of sand and gravel from the Sherbrooke-Lewiston 2° quadrangle has been low when compared with other counties.


=PRODUCTION ABOVE AVERAGE WITHIN STATE
AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
WALDO
KENNEBEC
OXFORD
COOS
ESSEX
CALEDONIA
WASHINGTON
LAMOILLE
FRANKLIN
ORLEANS
GRAND ISLE
CHITTENDEN
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBERLAND
LINCOLN
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
SULLIVAN
BELKNAP
YORK
STRAFFORD
MERRIMACK
ROCKINGHAM
BENNINGTON
WINDHAM
CHESHIRE
HILLSBOROUGH
0 20 MILES

Stone 108

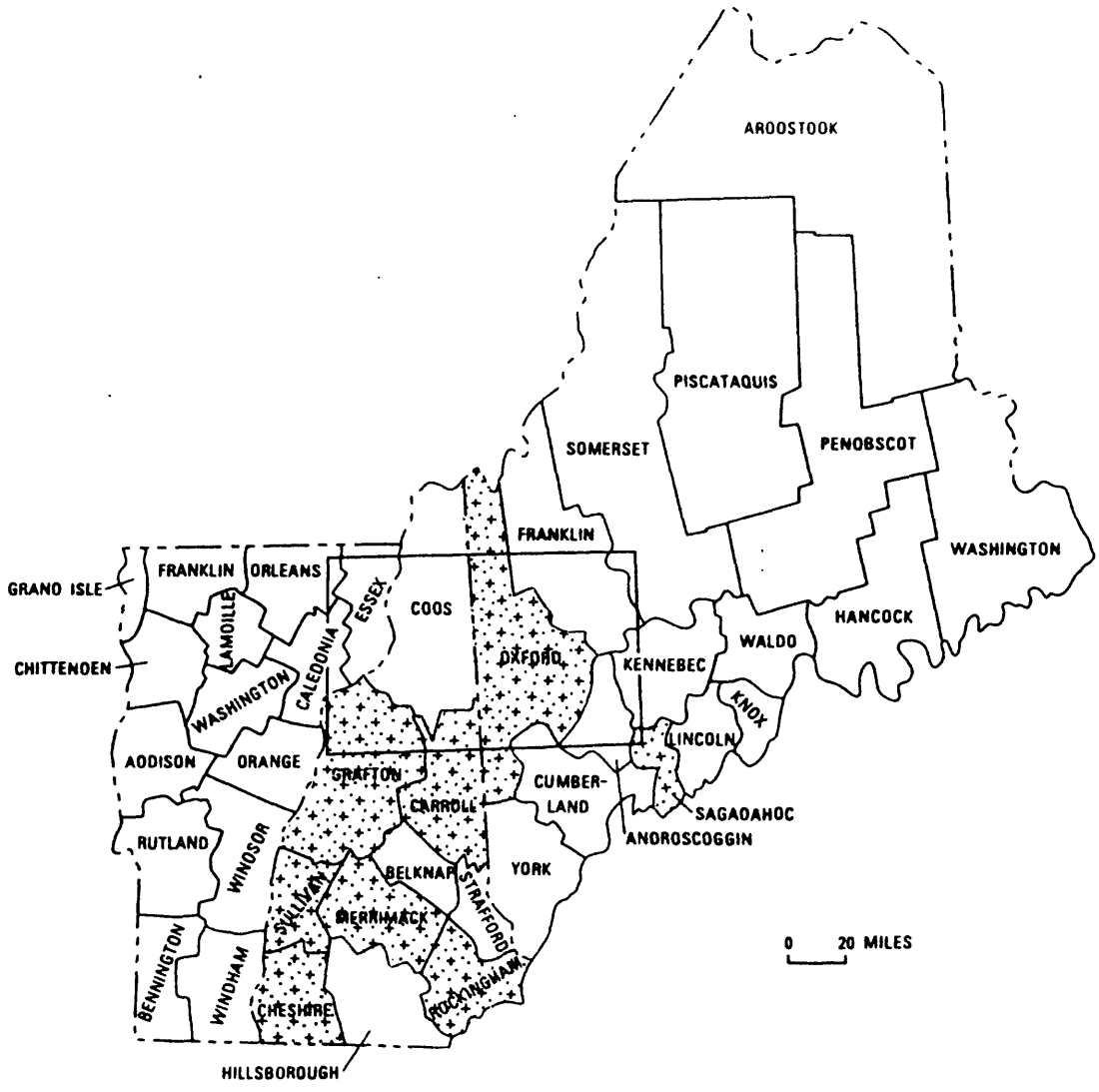
State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE*		9197286	73420146	916.41
Lincoln	-	-	-	-
Sagadahoc	1967	124	135	0.20
Oxford	1963, 67	341	3925	0.73
Somerset	1938-40, 57, 67-68	21960	103767	10.29
Androscoggin	1967-68	10101	13661	11.12
Franklin	1937-38, 40-41, 46-47, 72	3852	155909	35.23
Penobscot	1948-49, 54-57, 60-61, 64, 74, 76	382913	912755	103.96
Aroostook	1937-47, 50-52, 56, 67-68	825054	2278731	128.99
Washington	1938-43, 46, 50, 55-60, 67, 75-77	127760	1196671	180.90
Piscataquis	1956-57, 60-75	30109	3120386	308.67
Kennebec	1939-42, 51, 53-68	718614	1422740	630.09
York	1938-43, 45-50, 54-69, 72-76	282038	10117239	3901.75
Waldo	1938-42, 44, 46-50, 53-65, 67	185584	7938345	4158.38
Hancock	1937-50, 53-77	516266	21252800	5338.56
Cumberland	1939-42, 49, 51-77	4548836	12442096	5464.25
Knox	1938-50, 53-71	1306803	9106108	9525.22
Undistributed	1923, 39-48, 50-52, 72, 73	236931	3354878	41.87
NEW HAMPSHIRE*		8961476	60103637	2568.64
Strafford	1957-58, 64, 67, 71-73	21487	19017	19.52
Belknap	1957, 60, 63-67, 71, 74-75	29748	29512	28.49
Cheshire	1937, 57, 60-68, 71, 74-75	59580	64315	34.73
Coos	1937-43, 47-50, 52-65, 67-68, 73-75	131939	181634	38.53
Sullivan	1958-59, 61-68, 71, 73-75	129248	445638	319.22
Carroll	1937-41, 56-58, 62-63, 65-75	57641	1126739	463.87
Grafton	1912-29, 37-40, 45-77	2649226	4261331	949.92
Rockingham	1940-43, 45, 56-58, 61-69, 71-77	3708840	7023640	3923.82
Merrimack	1937-50, 52-77	893146	15696488	6515.77
Hillsborough	1937-50, 52-53, 56-77	1200863	30364091	13127.58
Undistributed	1923, 40-43, 46-53	79758	891232	38.09

VERMONT		20519699	476257524	19834.97
Essex	1966, 72, 74	7553	13340	7.77
Lamoille	1966, 72-75, 77	22944	30109	24.54
Addison	1960	13608	82993	40.88
Bennington	1939, 63, 65-67, 77	33992	92704	53.28
Franklin	1936-38, 47-55, 60	164817	797753	466.80
Chittenden	1939-43, 60	421300	858939	622.42
Orleans	1912-33, 35, 37-42, 57, 61-77	857981	1841673	994.42
Windham	1936-37, 40, 58-64, 66-67, 77	1867977	2612350	1281.82
Caledonia	1937, 63-66, 68, 72-75, 77	2316757	4033369	2544.71
Windsor	1937, 54-57, 59-77	3715955	9669288	3869.26
Grand Isle	1936-43, 45-57, 59-60, 62-65, 67, 73-74, 77	13726	1764603	8207.46
Orange	1937-50, 53-75, 77	881698	32800342	18354.98
Rutland	1936-77	4145575	217896640	90752.45
Washington	1936-51, 53-75, 77	4642007	170479965	93107.57
Undistributed	1938, 40, 42-52, 56	1413809	33283456	1386.18

* County totals do not sum to state totals because undistributed production summed into state totals.

Stone (108) - Production of stone includes dimension, broken, and crushed products of granite, marble, sandstone, limestone, basalt (trap rock), and slate. Stone has been produced from all 40 counties of Maine, New Hampshire, and Vermont. The per ton value of dimension stone is much higher than broken or crushed stone.

BERYLLIUM (304)

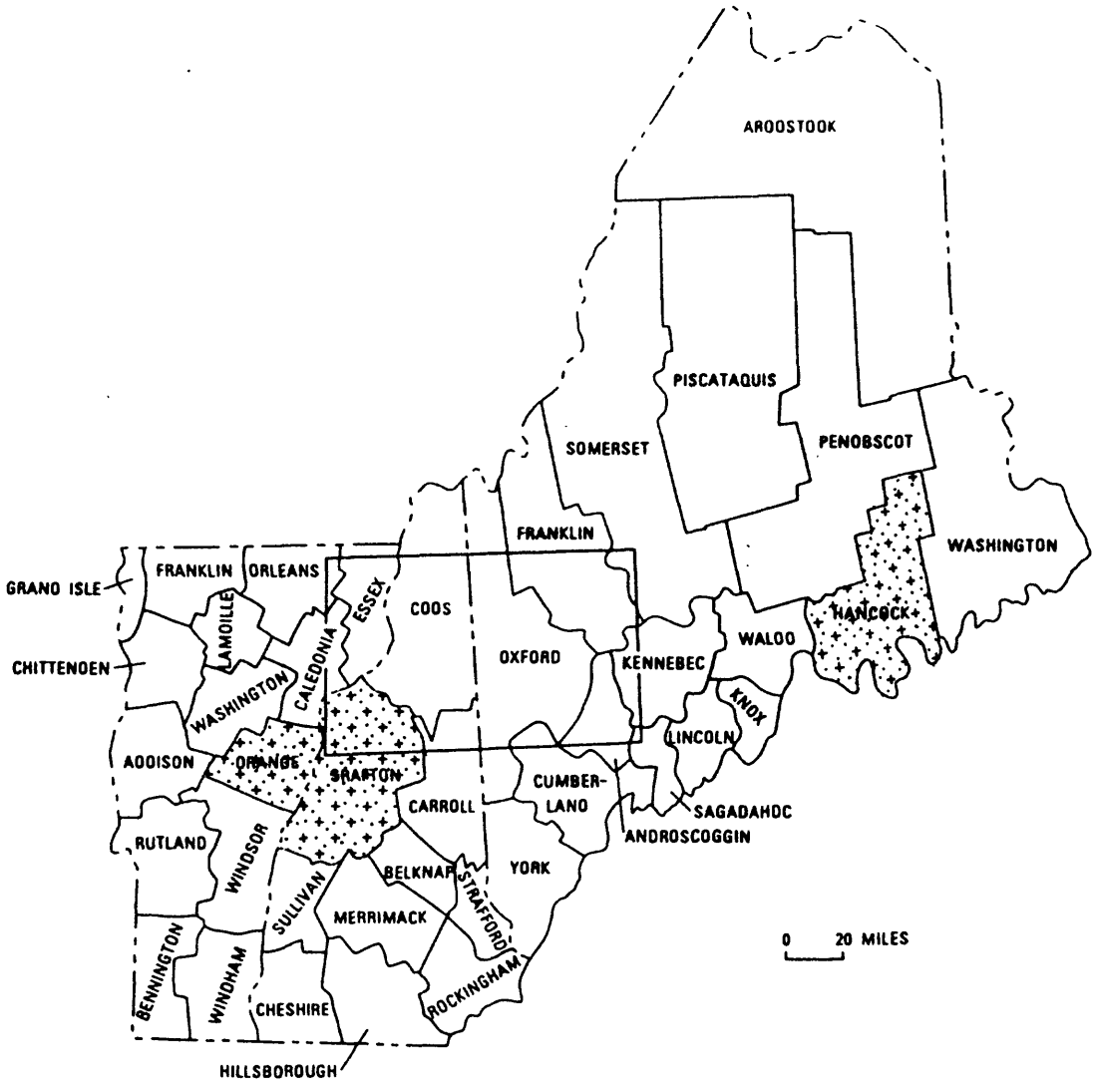


Beryllium 304

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Oxford	1960-62, 69	3.9	8588	1.59
Sagadahoc	1960-61	2.8	1779	2.67
Undistributed	1960	0	56	-
NEW HAMPSHIRE				
Merrimack	1960, 62	0.2	110	0.05
Rockingham	1960, 62	0.2	84	0.05
Carroll	1961	0.4	169	0.07
Sullivan	1961-62	0.8	488	0.35
Grafton	1960-62	21.3	13538	3.02
Cheshire	1960-62	15.5	11050	5.97
Undistributed	1960, 62	2.0	1391	0.06

Beryllium (304) - Production of beryllium has been reported from eight counties, four of which occur in the 2° quadrangle: Oxford and Sagadahoc, Maine; Grafton and Carroll, New Hampshire. Beryllium concentrates, which average 12% beryllium oxide, is produced as a byproduct of feldspar mining in pegmatites and during the 1960's contributed to the U.S. strategic stockpile.

COPPER (309)

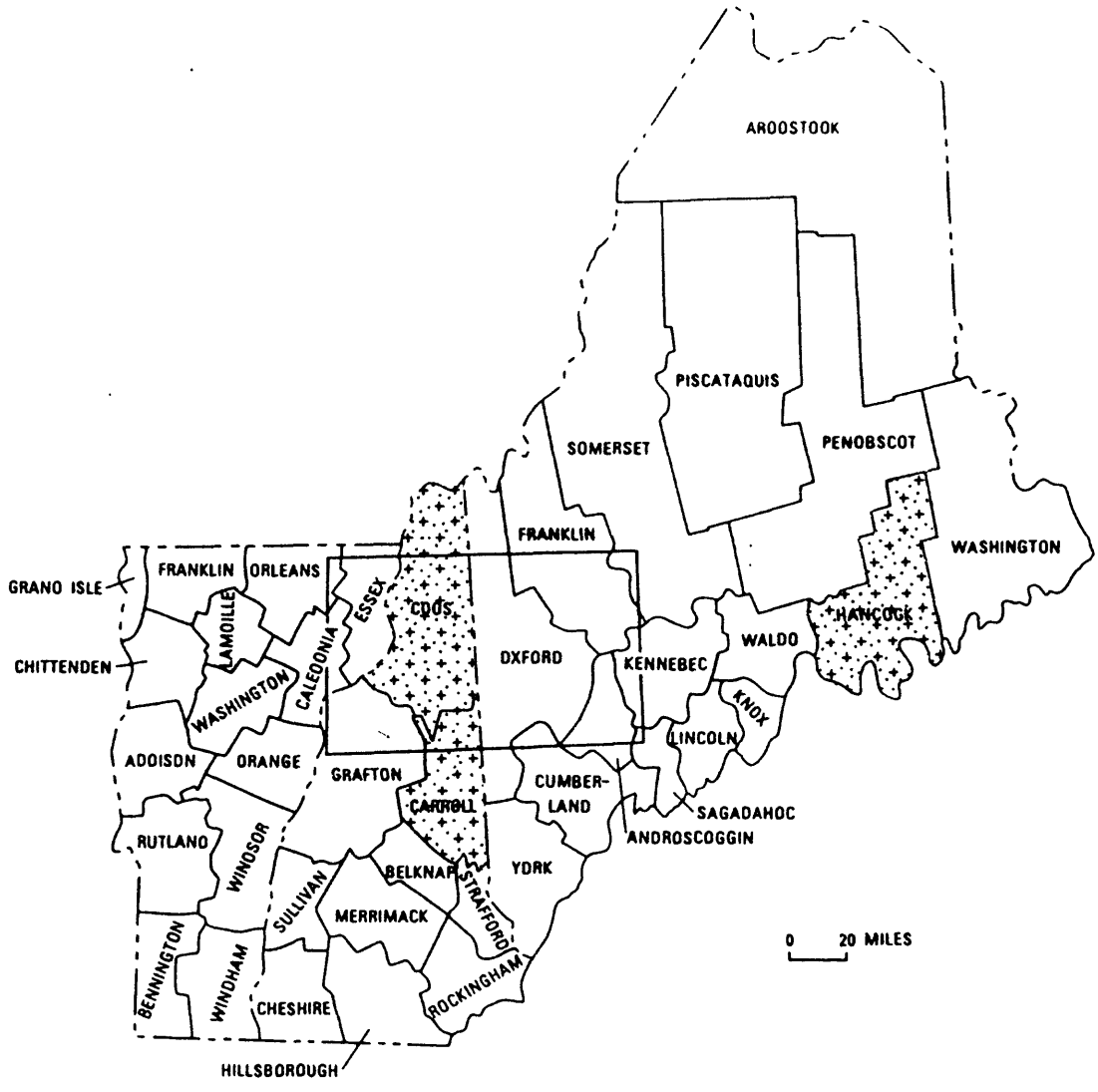

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
GRAND ISLE
FRANKLIN
ORLEANS
ESSEX
COOS
LAMOILLE
CALEDONIA
OXFORD
KENNEBEC
WALDO
CHITTENDEN
WASHINGTON
KNOX
LINCOLN
ADDISON
ORANGE
GRAFTON
CUMBER-
LAND
CARROLL
SAGADAHDC
ANDROSCOGGIN
RUTLAND
WINDSOR
BELKNAP
YORK
SULLIVAN
MERRIMACK
STRAFFORD
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBOROUGH
0 20 MILES

Copper 309

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1918-19, 68-77	15403	14649401	3679.83
NEW HAMPSHIRE				
Grafton	1908-10	125	77667	17.31
VERMONT				
Orange	1907, 13, 15-19, 26-27, 29-30, 45-46, 48, 51-57	33070	24207497	13546.44

Copper (309) - Production of copper has been reported from three counties, one of which occurs in the Lewiston 2° quad; Grafton, New Hampshire. Last reported production from these three states was in 1977 with the closing of Blue Hill, Hancock County, Maine.

LEAD (311)

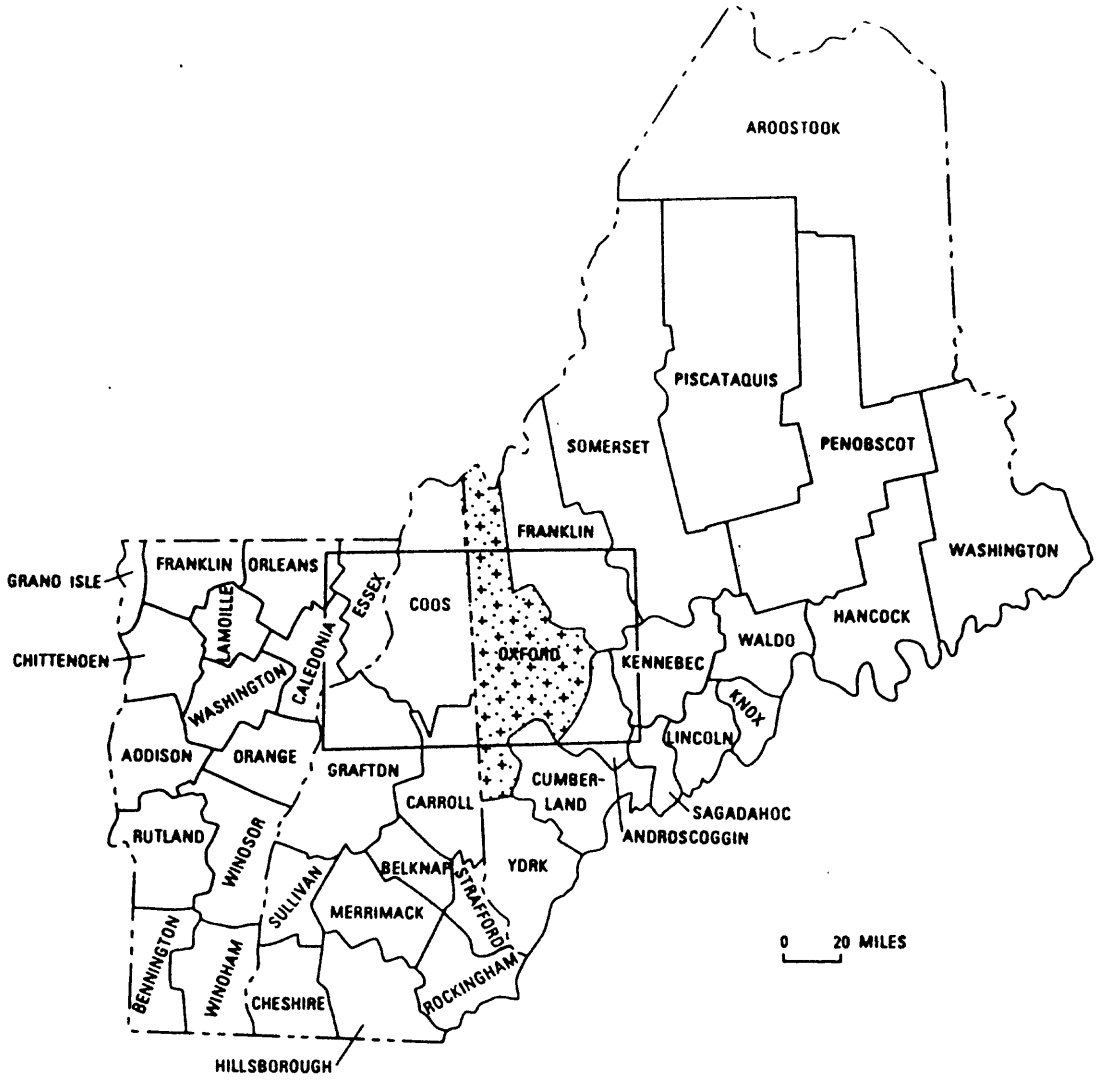

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
GRAND ISLE
FRANKLIN
ORLEANS
ESSEX
COOS
LAMOILLE
CALEDONIA
OXFORD
KENNEBEC
WALDO
CHITTENDEN
WASHINGTON
KNOX
LINCOLN
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
BELKNAP
YORK
SULLIVAN
MERRIMACK
STRAFFORD
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBOROUGH
0 20 MILES

Lead 311

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1919, 1972-77	1204	349661	87.83
NEW HAMPSHIRE				
Coos	1907	3.5	1228	0.26
Carroll	1915-16	44.7	15298	6.30

Lead (311) - Production of lead occurs within two counties of the Sherbrooke-Lewiston 2° quad; Coos and Carroll Counties, New Hampshire. Last reported production from Coos County was 1907 (Milan Mine) and the last reported production from Carroll County was 1916 (Madison Mine).

LITHIUM (312)

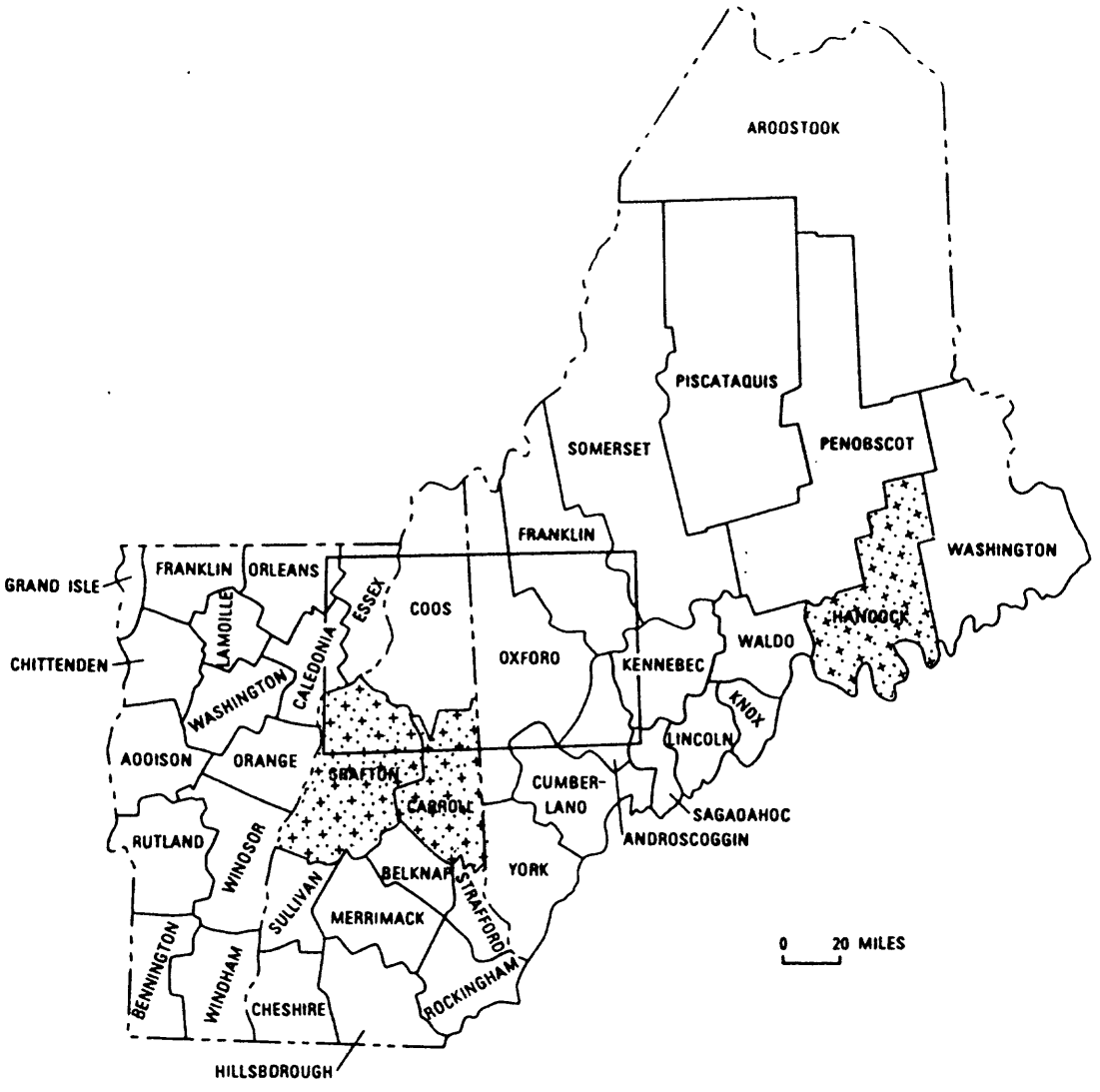

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
WASHINGTON
FRANKLIN
HANCOCK
WALDO
KENNEBEC
OXFORD
COOS
ESSEX
CALEDONIA
LAMOILLE
WASHINGTON
FRANKLIN
ORLEANS
GRAND ISLE
CHITTENDEN
ADDISON
ORANGE
GRAFTON
CUMBER-
LAND
KNOX
LINCOLN
SAGADAHOC
ANDROSCOGGIN
CARROLL
RUTLAND
WINDSOR
SULLIVAN
BELKNAP
STRAFFORD
YORK
MERRIMACK
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBOROUGH
0 20 MILES

Lithium 312

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Oxford	1944, 46, 48-50	135	5509	1.02

Lithium (312) - Production of lithium has been reported from Oxford County, Maine. It is found in pegmatites as spodumene and is recovered as a byproduct of feldspar mining.

ZINC (325)

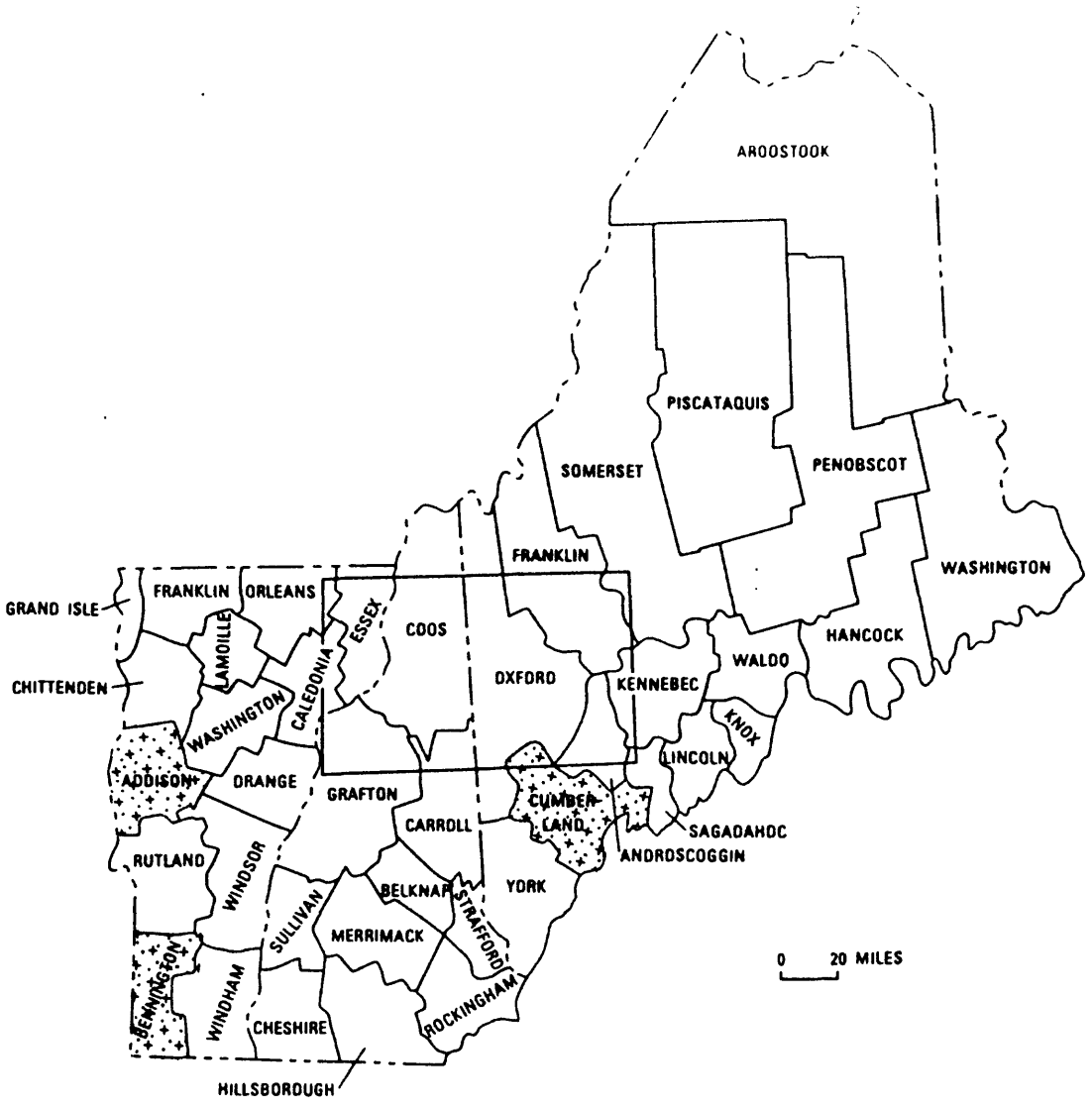

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
WALDO
KENNEBEC
OXFORO
COOS
ESSEX
CALEDONIA
LAMOILLE
FRANKLIN
ORLEANS
GRAND ISLE
CHITTENDEN
WASHINGTON
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
KNOX
LINCOLN
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
SULLIVAN
BELKNAP
YORK
STRAFFORD
MERRIMACK
ROCKINGHAM
BENNINGTON
WINDHAM
CHESHIRE
HILLSBOROUGH
0 20 MILES

Zinc 325

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1968-77	78910	29494488	7408.81
NEW HAMPSHIRE				
Grafton	1913-14	19.3	6473	1.44
Carroll	1915-16	54.5	38571	15.88

Zinc (325) - Production of zinc has been reported from three counties, two of which lie within the Sherbrooke-Lewiston 2° quadrangle: Carroll and Grafton Counties, New Hampshire. The last reported production from Hancock County, Maine, was in 1977 at the Blue Hill mine.

CLAY - NONMETALLIC (406)

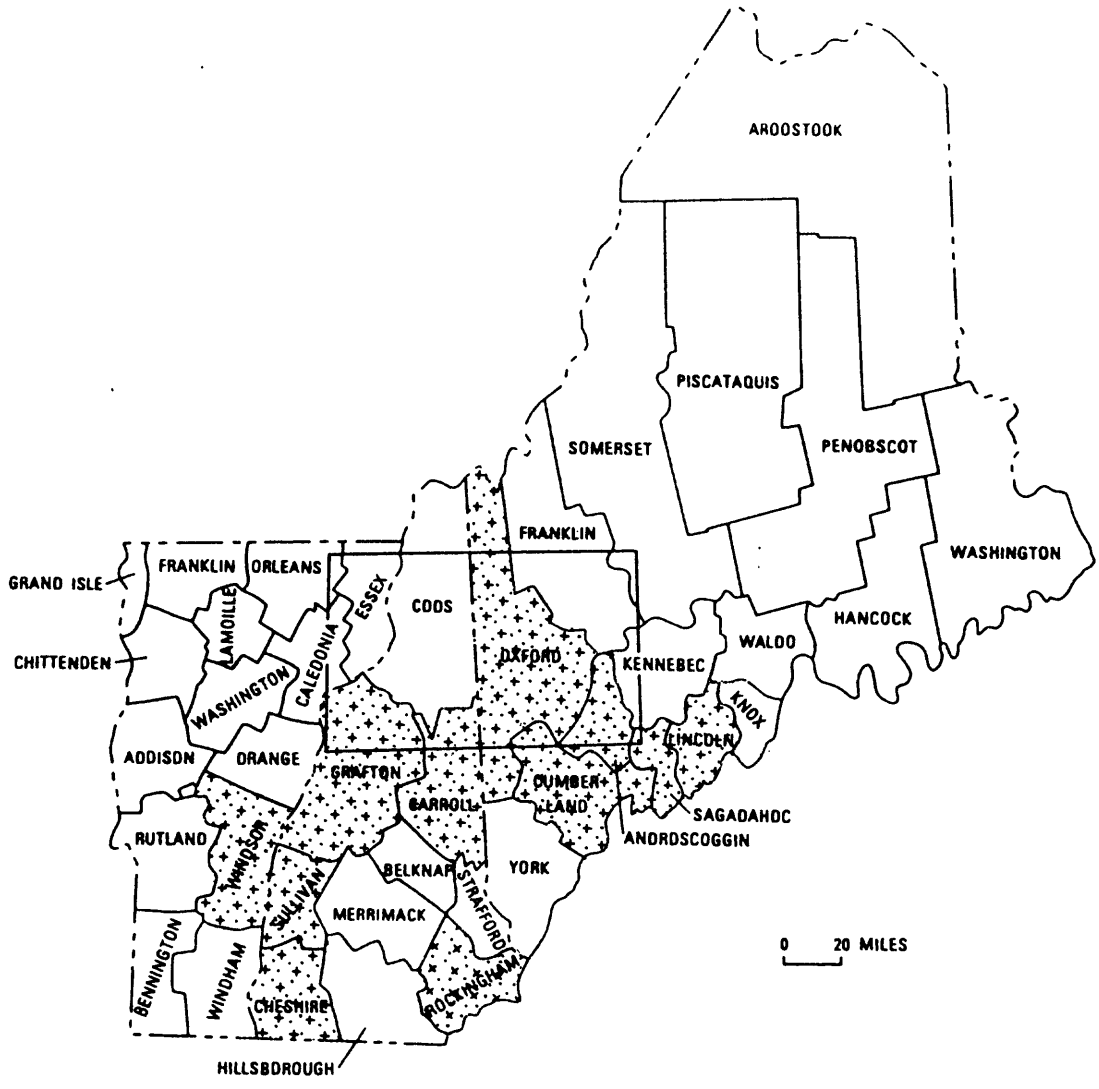


Clay-Nonmetallic 406

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Cumberland	1933	61.7	3586	1.57
VERMONT				
Addison	1939-44	1440	25712	12.67
Bennington	1933-34, 39-42	1185	30666	17.62

Clay-nonmetallic (406) - Production of nonmetallic clay includes high quality clays of kaolin, fire clay, potter's clay or stoneware clay for pottery.

FELDSPAR (408)

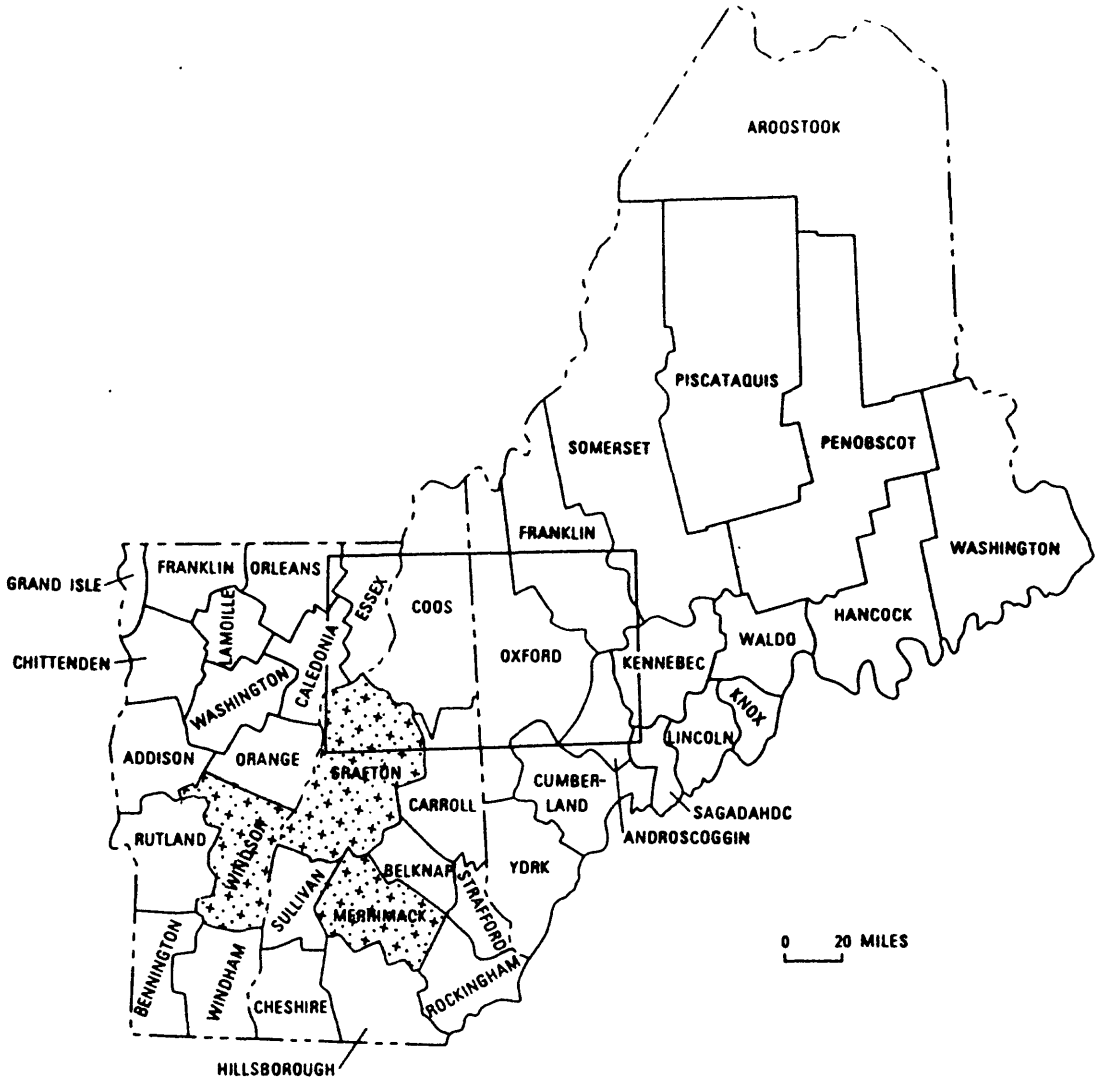


Feldspar 408

State	Years of production	Cumulative metric tonnes	1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Lincoln	1924, 42-43	359	4823	4.10
Cumberland	1924-25, 29-30, 37-41, 43-44, 46, 52	6400	82597	36.27
Oxford	1911-13, 24-34, 37-50, 52, 60-70, 76-77	255716	2577022	477.93
Androscoggin	1919-20, 24-31, 34, 37-38, 40, 52, 61	39403	653467	532.14
Sagadahoc	1914-18, 20-21, 24-27, 29-34, 37-47, 49-52, 60-61	310997	3820793	5736.93
Undistributed	1909, 22-23, 35-36, 53-59	204246	2265193	28.27
NEW HAMPSHIRE				
Carroll	1922, 24, 27, 62	2840	28248	11.63
Rockingham	1944, 46-49	10815	106042	59.24
Grafton	1914-17, 22, 24-29, 31, 34, 37, 39-52, 60-69	187241	2308149	514.52
Sullivan	1927-29, 33, 37-45, 49-52, 62-63, 68	78087	885110	634.03
Cheshire	1922, 24-26, 28-34, 37-52, 60-61, 63-65	705218	7984085	4311.06
Undistributed	1921, 23, 35-36, 43, 53-59	338410	3761778	160.77
VERMONT				
Windsor	1912-13, 16	259	2762	1.11

Feldspar (408) - Production of feldspar is reported from 11 counties, six of which lie within the Sherbrooke-Lewiston 2° quad: Androscoggin, Cumberland, Sagadahoc, and Oxford, Maine; Carroll and Grafton, New Hampshire. Feldspar is produced from the granitic pegmatites of the area mostly to be ground and sold for the manufacture of pottery or glass.

GARNET (410)

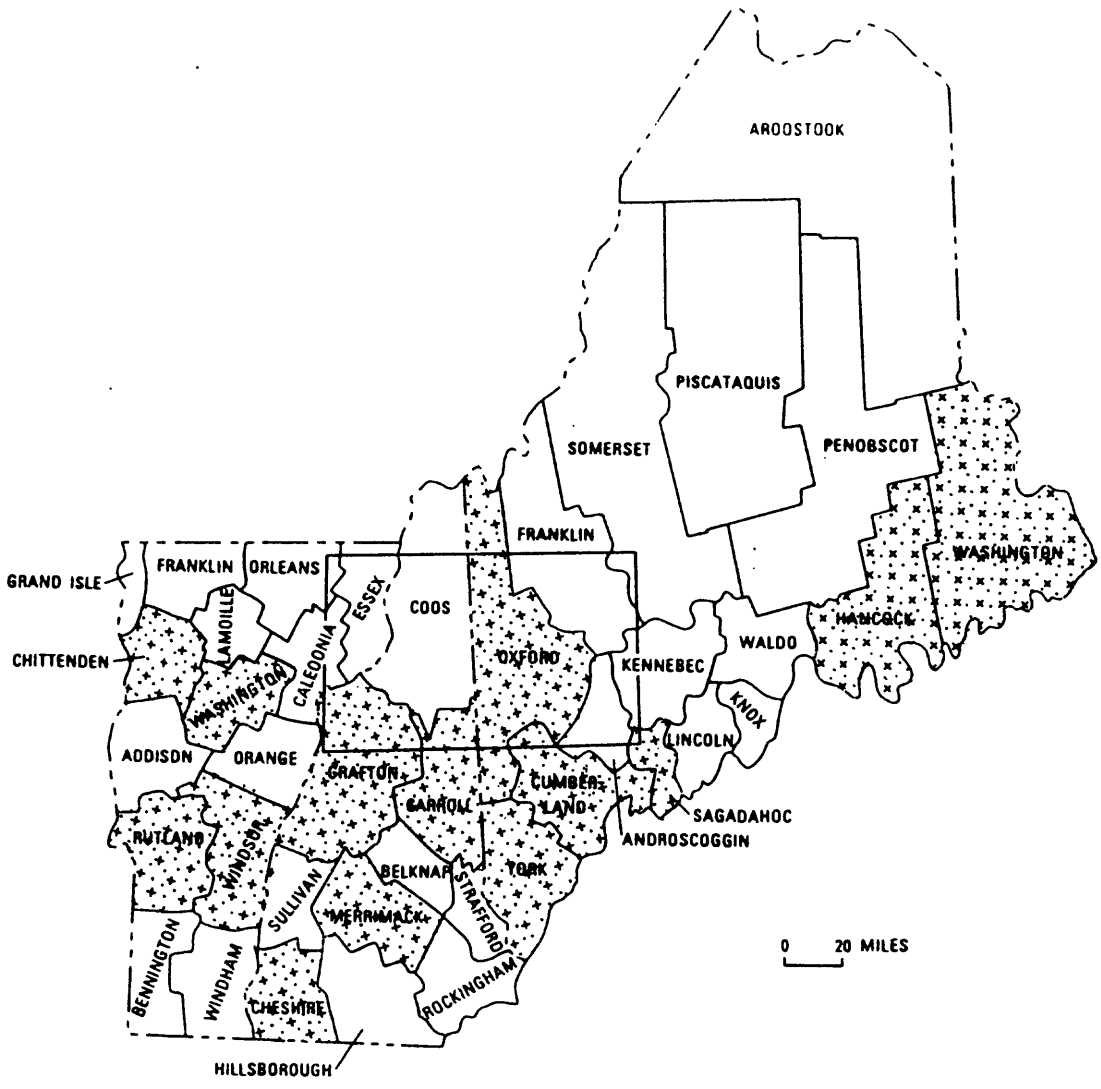

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
WALDO
KENNEBEC
OXFORD
COOS
ESSEX
CALEDONIA
WASHINGTON
LAMOILLE
FRANKLIN
ORLEANS
GRAND ISLE
CHITTENDEN
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
KNOX
LINCOLN
SAGADAHDC
ANDROSCOGGIN
RUTLAND
WINDSOR
SULLIVAN
BELKNAP
YORK
STRAFFORD
MERRIMACK
ROCKINGHAM
BENNINGTON
WINDHAM
CHESHIRE
HILLSBOROUGH
0 20 MILES

Garnet 410

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
NEW HAMPSHIRE				
Grafton	1935	54	13455	3.00
Merrimack	1936-37	316	49676	20.62
Undistributed	1934	181	36233	1.55
VERMONT				
Windsor	1939-41	1318	32465	12.99

Garnet (410) - Production of garnet is reported from three counties, one of which lies within the Sherbrooke-Lewiston 2° quadrangle: Grafton County, New Hampshire. This abrasive garnet which is mined is mostly of the almandite variety.

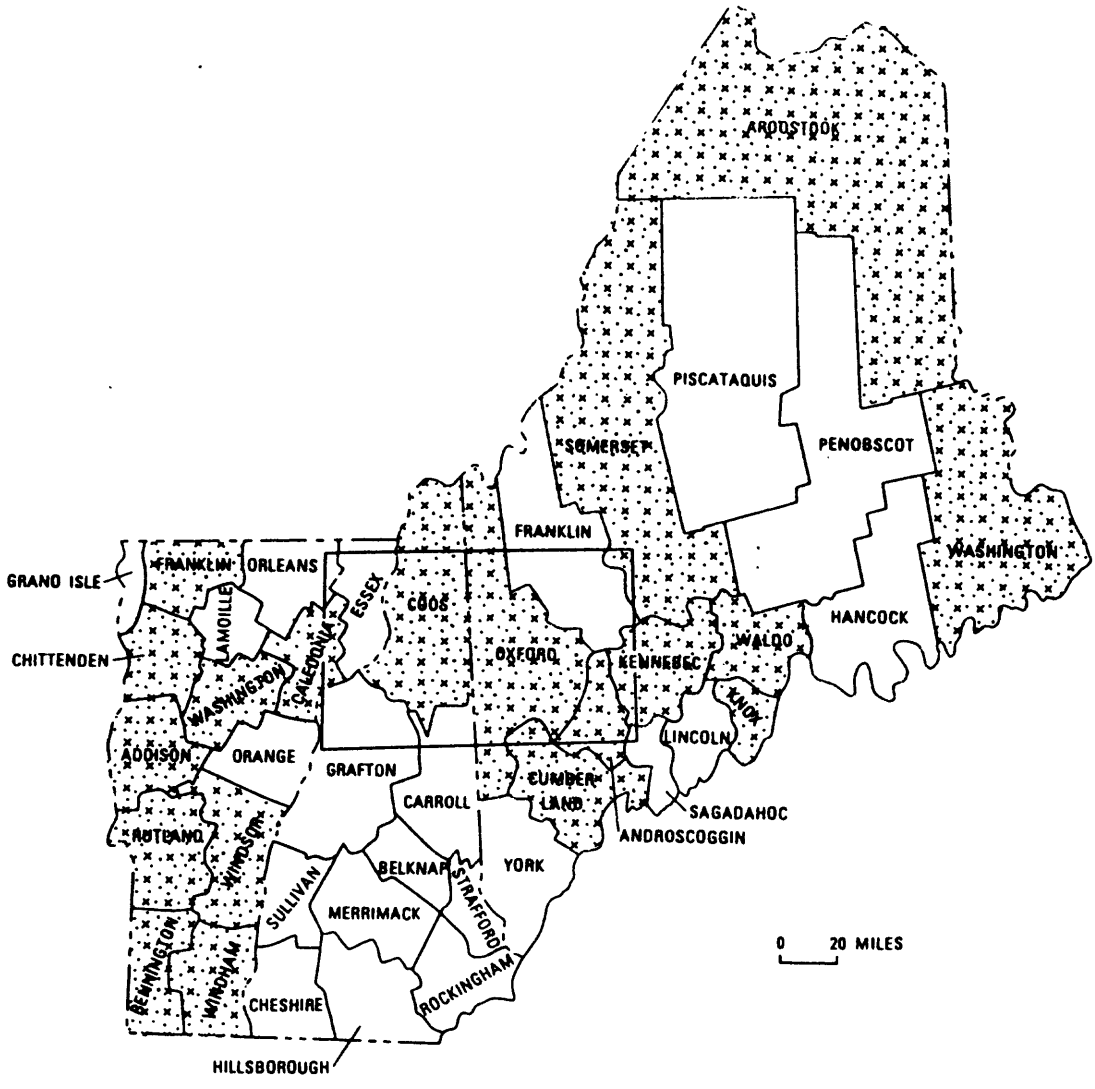
GEMSTONES (411)



State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
York	1962	-	2	-
Washington	1960	-	6	-
Sagahadoc	1961	-	1	-
Hancock	1961	-	53	0.01
Cumberland	1960, 62	45	134	0.06
Oxford	1960-63	6	5176	0.96
Undistributed	1960-69, 77	-	810162	10.11
NEW HAMPSHIRE				
Cheshire	1961	-	1	-
Merrimack	1961	-	32	0.01
Grafton	1961-62	-	268	0.06
Carroll	1960, 62	-	200	0.08
Undistributed	1960-69, 77	-	222083	9.49
VERMONT				
Windsor	1960-61	-	3	-
Rutland	1961	-	11	-
Washington	1962	0.1	8	-
Chittenden	1960	4.5	1054	0.76
Undistributed	1961-69, 77	-	22455	0.94

Gemstones (411) - The production of gemstones from the Sherbrooke-Lewiston 2° quadrangle has been very diverse due to the diversity of the lithologies and the presence of pegmatites. Production figures of tonnages and values are very difficult to determine due to the large amount consumed by "rock hounds and mineral collectors." A partial list of gemstones present are: beryl, mica, tourmaline, lithium minerals (amblygonite, lepidolite, spodumene), galena, garnet, scheelite, diopside, epidote, smoky quartz, jasper, agate, and, amethyst.

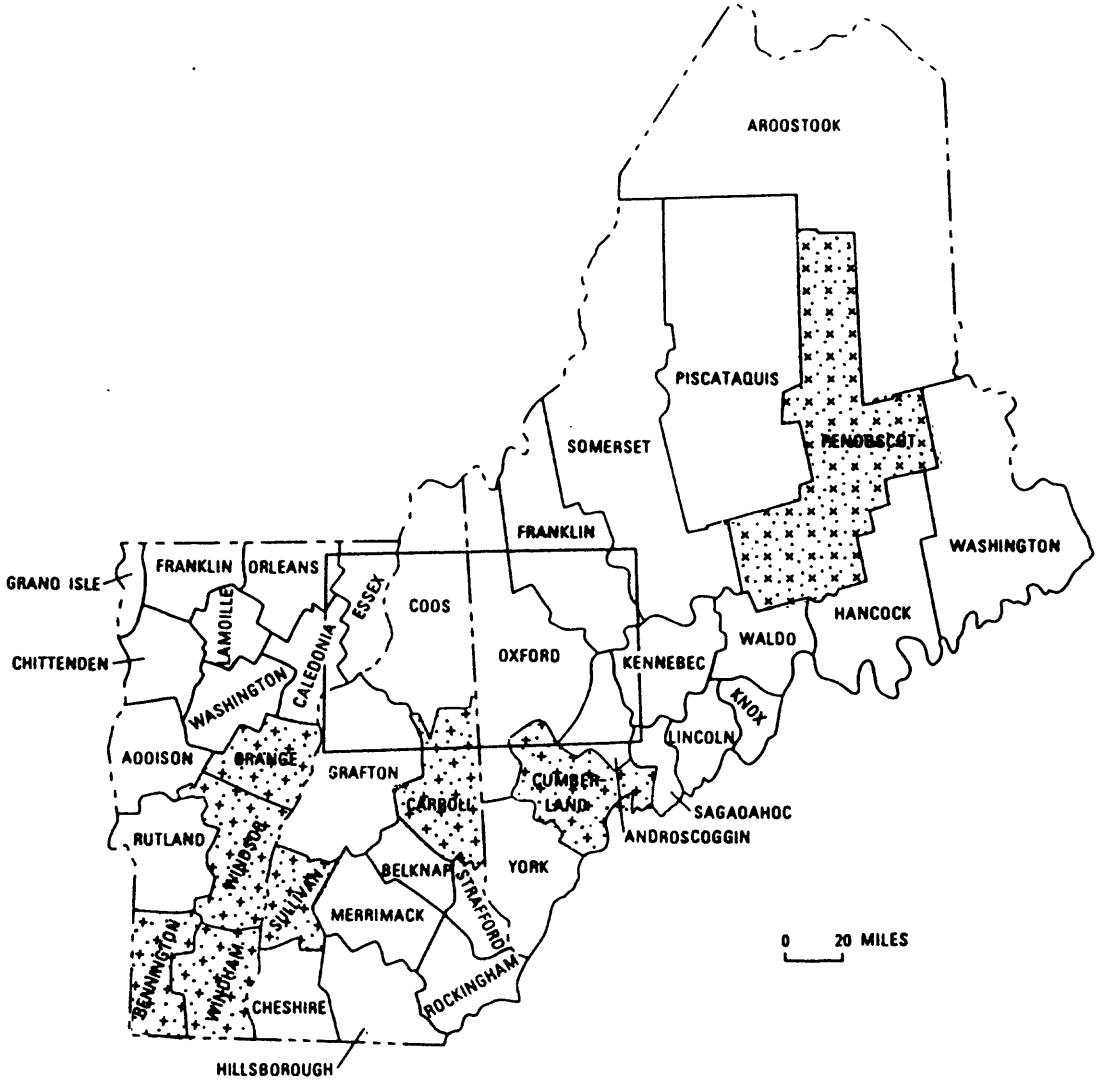
LIME & LIMESTONE (413)



State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Androscoggin	1940	456	6683	5.44
Waldo	1965	44681	49468	25.91
Somerset	1929, 33, 58, 62-64, 75	163824	356538	35.35
Washington	1968	47627	551042	83.30
Aroostook	1933, 37, 39, 41-43, 46-50, 54, 58, 60, 62-63, 65-69, 74-77	1455291	3879416	219.60
Oxford	1962-68	239592	4783640	887.17
Cumberland	1958, 68, 70-72, 74-77	671724	2483901	1090.87
Kennebec	1959-60, 62-77	1016823	2708513	1199.52
Knox	1910-12, 25-26, 28-77	21165830	64321403	67281.80
Undistributed	1906-09, 27, 47-50	704954	10561385	131.82
NEW HAMPSHIRE				
Coos	1968	48081	1033812	219.31
VERMONT				
Caledonia	1961	272	5396	3.40
Windham	1910-12, 33	2352	44953	22.06
Washington	1955, 70	456813	569956	311.28
Bennington	1929, 33, 52-53	136529	675403	388.16
Windsor	1910-12, 25-34, 37-42, 61	184531	1297459	519.19
Addison	1929, 33, 37-40, 47-60, 62, 67, 72-75, 77	1421749	16061117	7911.88
Franklin	1910-12, 25-43, 47-75, 77	7673031	21311019	12469.88
Chittenden	1911-12, 25-77	9044725	20875798	15127.39
Rutland	1910-12, 25-39, 41-45, 47-75, 77	5755324	79645116	33171.64
Undistributed	1907-09, 41-47, 50, 53	164131	2054741	85.57

Lime and Limestone (413) - The production of lime and limestone is very important to the economies of Maine and Vermont. Coos County is the only reported producer in New Hampshire. Crushed and broken limestone is used for cement, quicklime and hydrated lime.

SAND (421)

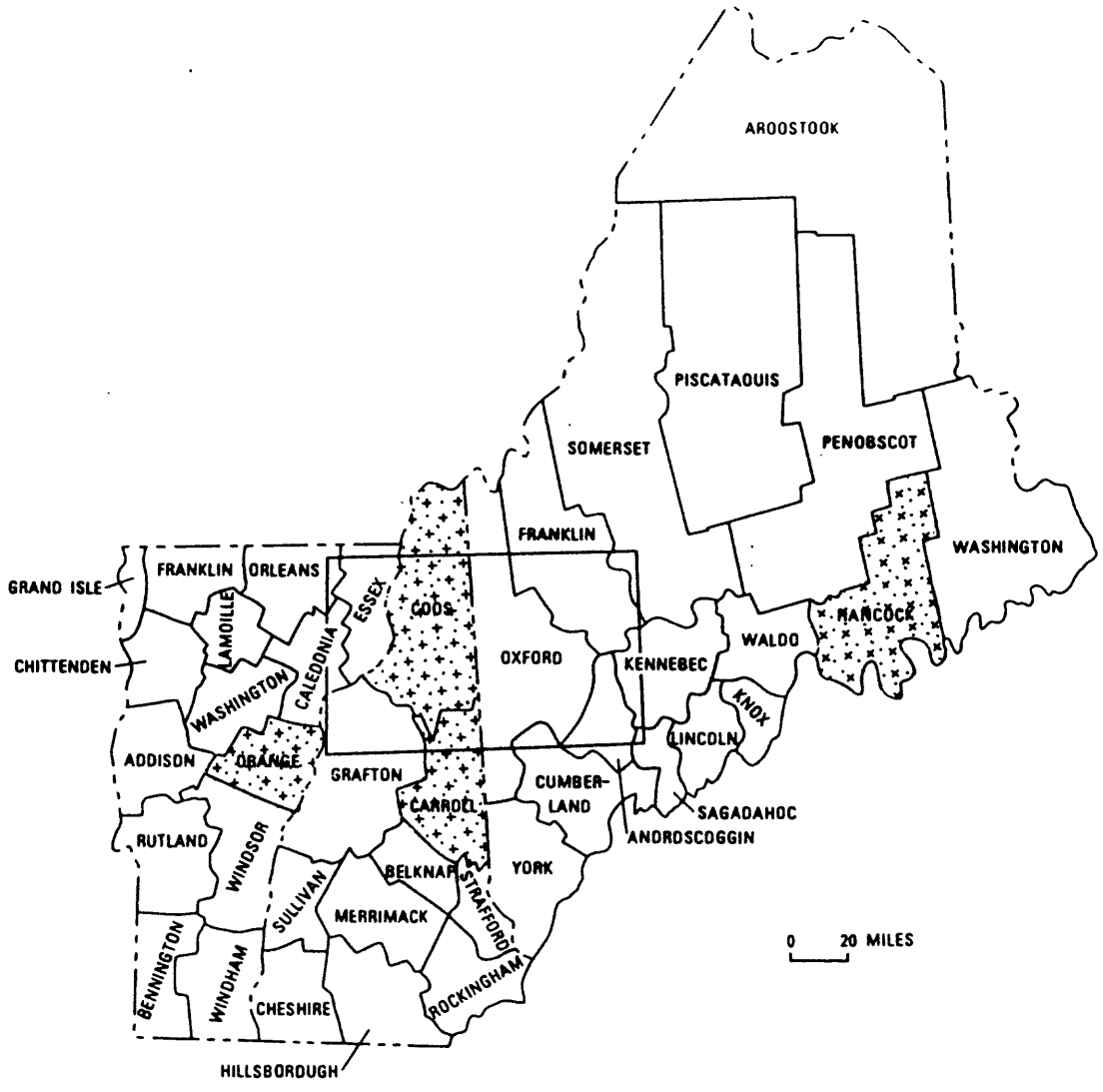

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
GRAND ISLE
FRANKLIN
ORLEANS
LAMOILLE
ESSEX
COOS
CHITTENDEN
CALEDONIA
OXFORD
KENNEBEC
WALDO
HANCOCK
WASHINGTON
KNOX
LINCOLN
ADDISON
ORANGE
GRAFTON
CUMBER-
LAND
CARROLL
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
BELKNAP
YORK
SULLIVAN
STRAFFORD
MERRIMACK
BENNINGTON
WINDHAM
ROCKINGHAM
CHESHIRE
HILLSBOROUGH
0 20 MILES

Sand 421

State	Years of production	Cumulative metric tonnes	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Penobscot	1975	11793	20439	2.33
Cumberland	1973-75	754409	1655283	726.96
NEW HAMPSHIRE				
Carroll	1956	19	2272	0.94
Sullivan	1968	77	24870	17.82
Hillsborough	1968-73	33428	648686	280.45
VERMONT				
Windham	1972-73, 75	127680	178861	87.76
Bennington	1968, 72-75	132219	262746	151.00
Windsor	1968	547485	1233201	493.48
Orange	1971, 73-75	758745	1906628	1066.94

Sand (421) - Production of sand is reported from eight counties, two of which lie within the Sherbrooke-Lewiston 2° quadrangle: Cumberland, Maine and Carroll County, New Hampshire. These sands are mature and a very clean source of quartz or silica. These are sometimes reported as quartzites which are then mechanically ground for quartz.

GOLD (502)

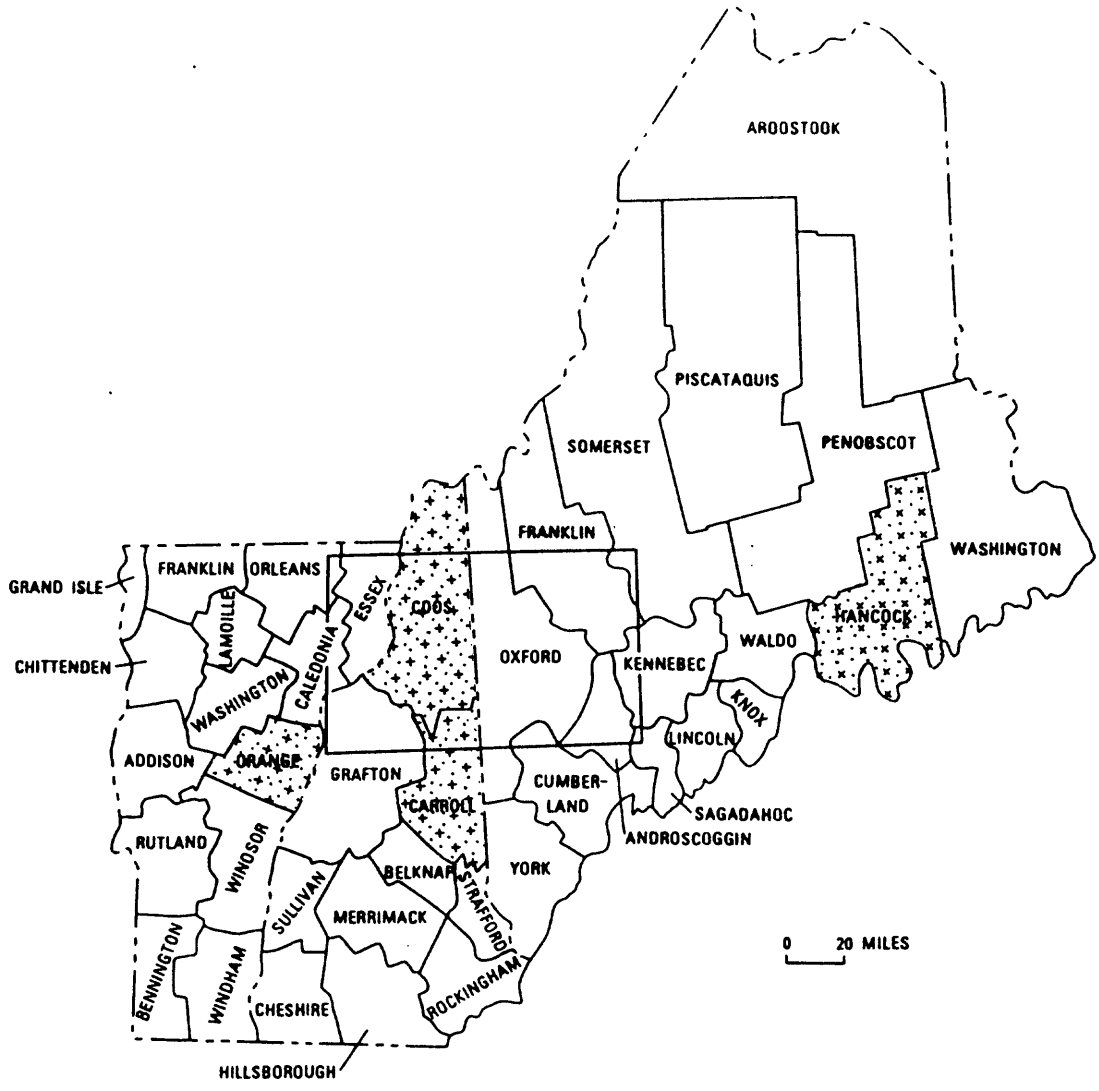

AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
GRAND ISLE
FRANKLIN
ORLEANS
LAMOILLE
ESSEX
COOS
CALEDONIA
CHITTENDEN
WASHINGTON
OXFORD
KENNEBEC
WALDO
KNOX
LINCOLN
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
BELKNAP
YORK
STRAFFORD
SULLIVAN
MERRIMACK
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBORDUGH
0 20 MILES

Gold 502

State	Years of production	Cumulative grams	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1918-19	1555	1168	0.29
NEW HAMPSHIRE				
Coos/Carroll	1908-10	9058	18042	2.53
VERMONT				
Orange	1907, 13, 17-19, 26, 43-57	60502	85835	48.03

Gold (502) - Production of gold has been reported from four counties, two of which lie within the SherbrookeLewiston 2° quadrangle: Carroll and Coos Counties, New Hampshire. This study could not partition production between these two counties, therefore, they are combined. As is apparent from the dates of production, mines that have yielded ores in time past, such as the Milan Mine in Coos County and Madison Mine in Carroll County, have been idle for many years.

SILVER (504)


AROOSTOOK
PISCATAQUIS
SOMERSET
PENOBSCOT
FRANKLIN
WASHINGTON
HANCOCK
GRAND ISLE
FRANKLIN
ORLEANS
LAMOILLE
ESSEX
COOS
CALEDONIA
CHITTENDEN
WASHINGTON
OXFORD
KENNEBEC
WALDO
KNOX
LINCOLN
ADDISON
ORANGE
GRAFTON
CARROLL
CUMBER-
LAND
SAGADAHOC
ANDROSCOGGIN
RUTLAND
WINDSOR
BELKNAP
YORK
SULLIVAN
MERRIMACK
STRAFFORD
BENNINGTON
WINDHAM
CHESHIRE
ROCKINGHAM
HILLSBOROUGH
0 20 MILES

Silver 504

State	Years of production	Cumulative grams	Cumulative 1967 U.S. $	Unit Regional Value 1967 U.S. $/km^2
MAINE				
Hancock	1918-19, 68-76	7555621	422686	106.18
NEW HAMPSHIRE				
Coos	1907	5412	342	0.07
Carroll	1915-16	30201	1447	0.60
Undistributed	1908-10	317131	16105	0.69
VERMONT				
Orange	1907, 13, 15-19, 26-27, 29-30, 45-46, 48, 51-57	12629126	437774	244.98
Undistributed	1943-44, 47, 49-50	3070005	239713	9.98

Silver (504) - Production of silver has been reported from four counties, two of which lie within the Sherbrooke-Lewiston 2° quadrangle: Carroll and Coos Counties, New Hampshire. As is apparent from the dates of production, mines that have yielded ores in times past, such as the Milan Mine in Coos County and Madison Mine in Carroll County, have been idle for many years.