Introduction

This region is made up of 3 countries, Canada, USA/Alaska and Mexico.

It is surrounded by the Atlantic Ocean in the east, Pacific ocean in the west, the Arctic ocean in the north and the Gulf of Mexico in the south.

It lies between 23 ½º N – 66 ½º N and 16º W – 60º W.

It covers an area of about 21.5 km^2

A sketch map of North America showing representative countries

Physical regions/ Relief

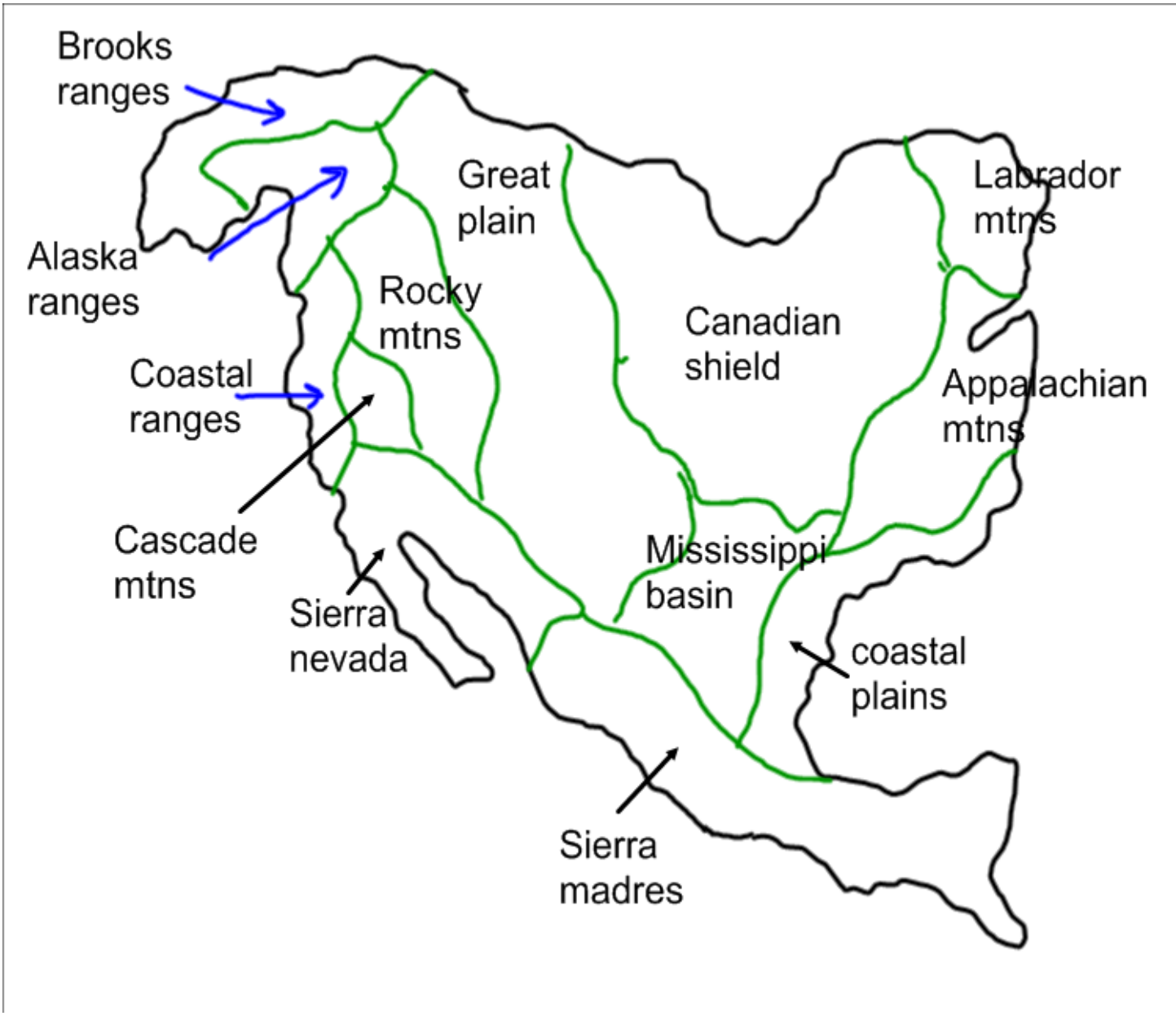
Western Highlands comprising of fold ranges parallel to each other, covering

almost ½ of North America and are the highest. They were formed as a result of compressional forces and consist of rocky mountains, Cascade mountains, Sierra Nevada mountains, etc.

Central Lowlands are flat and gently sloping. This is divided into the Mississippi basin and the Canadian Shield.
The most productive region having the Canadian prairies

Eastern Highlands comprising the Appalachian mountains, Labrador highlands and Coastal areas. They were formed by folding and are lower to the west than the east.

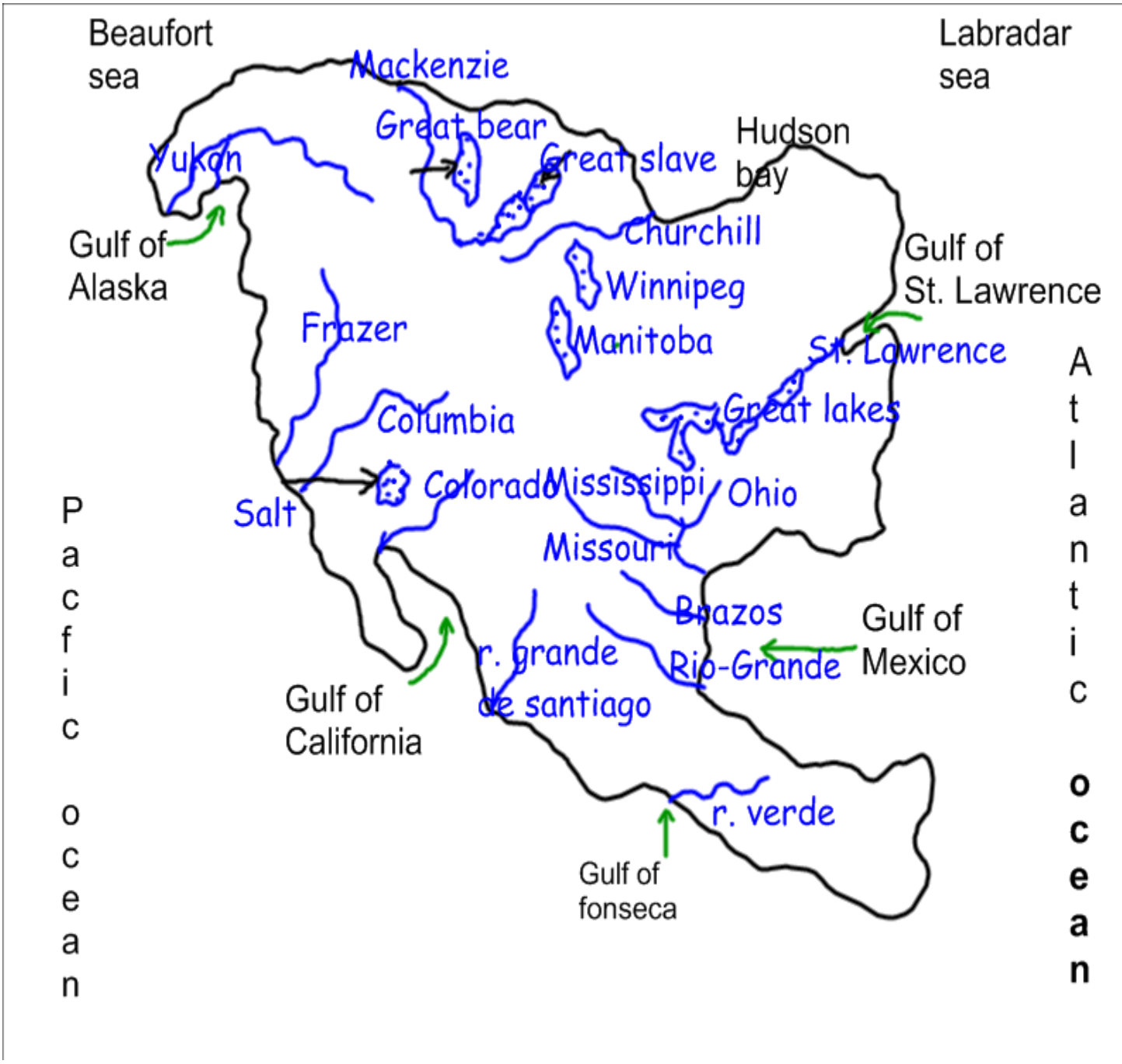
A sketch map showing physical regions



Drainage

North America is drained by a variety of rivers, lakes and surrounded by oceans and seas

A sketch map of North America showing drainage



A sketch map of North America showing drainage

Climate

North America lies outside the Tropics hence in the Temperate region.

Tundra with very cold winters and cool summers, rainfall is light and mainly full of snow fall. The areas include Banks island, Victoria islands, Baffin islands, etc.

Cold Temperate with long very cold winters and mild warm summers that are short.

Cool Temperate Western margin with cool mild wet winters and mild warm wet summers. Rainfall in this area is cyclonic.

Continental climatic region with very long dry winters which are cold except in the south, and has warm or hot summers with moderate rainfall which is mainly convectional.

Cool Temperate eastern margin with very cold snow winters, mild and fairly wet summers.

Temperate Desert with cold/cool winters and warm/hot summers with scanty rainfall.

Warm Temperate Western margin or Mediterranean region with mild winters and hot summers. Rainfall is moderate except in summer- summer droughts are long.

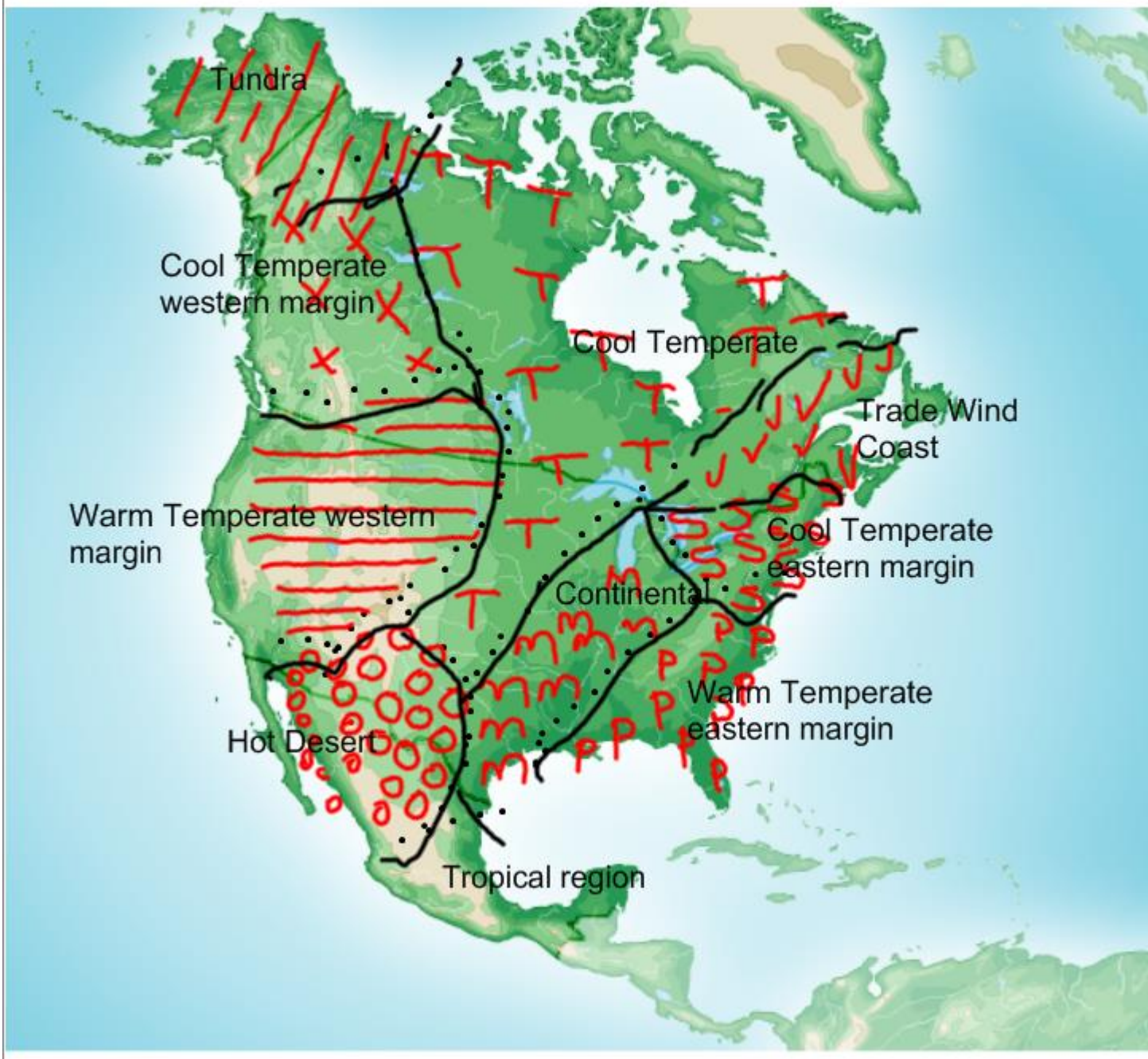
Warm Temperate eastern margin with mild to warm winters with moderate rainfall. Summers are hot with fairly heavy rainfall.

Hot desert with little or no rainfall, winters are cool and summers are warm tending to hot and dry.

Tropical region with hot and dry winters and very dry hot summers with heavy convectional rainfall.

Trade Wind coast with hot winters and very hot summers, rainfall is expected at all seasons.

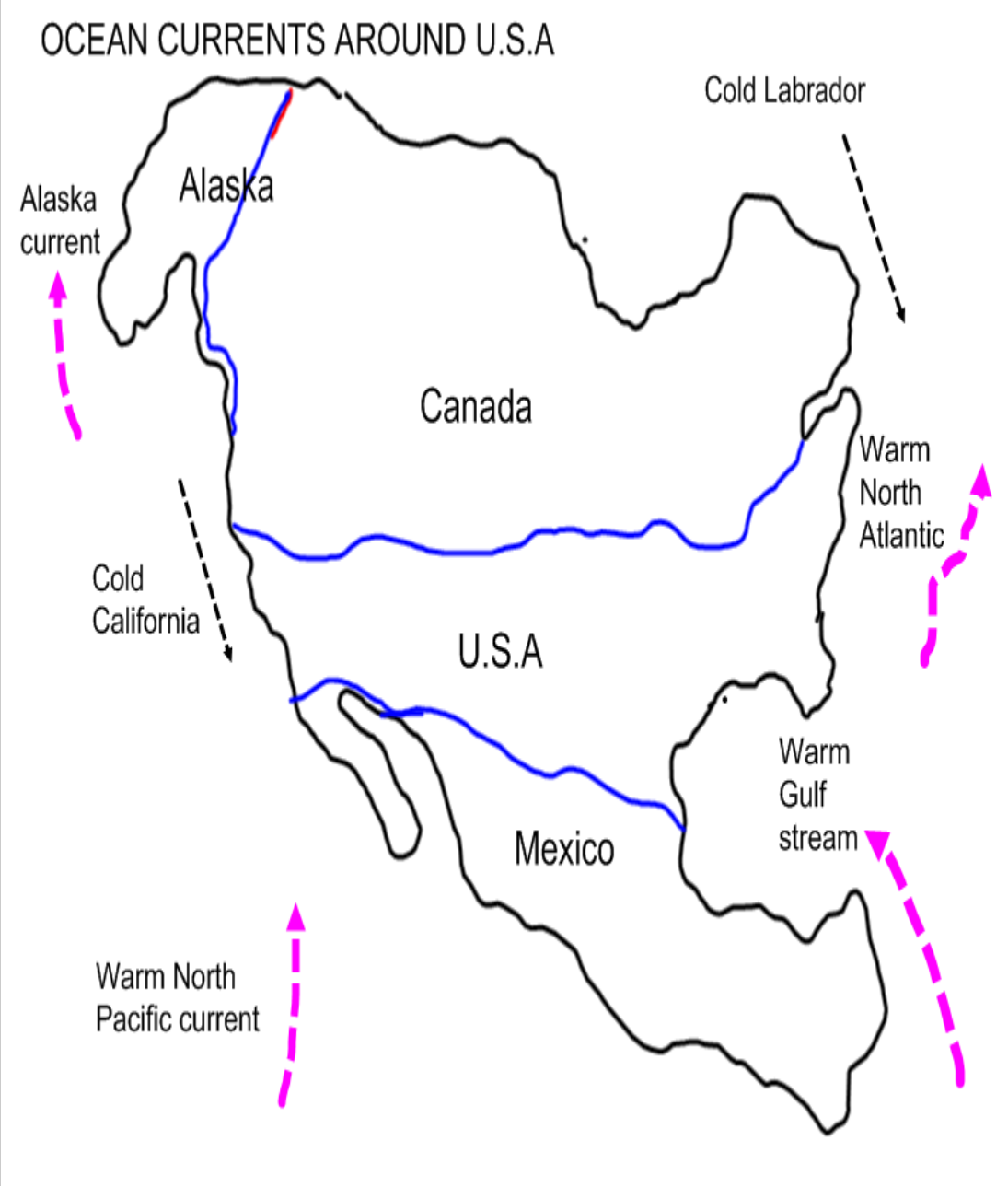
CLIMATE OF NORTH AMERIA



Factors for Climate

- Ocean currents i.e. movement of a large mass of water in an ocean with specific characteristics according to the direction of wind. E.g
  - Warm North Atlantic drift flowing northwards from the Gulf of Mexico and causes rainfall with warm temperatures along the eastern coast of North America.

- Warm North Pacific drift along the west coast from the Tropics bringing warm conditions on the west coast during winter.
- Cold Labrador Current flowing south wards from the Arctic Ocean along the eastern coast reducing temperatures and creating fog.
- Cold California current flowing near San Francisco lowering temperatures in summer and creating fog.



- Relief i.e. rocky mountains forming relief rainfall on the west side where moist wind from the Pacific ocean loses moisture on the Rockies and reach the central and eastern side dry with little or no rainfall.
- Distance from the sea i.e. causes a rise in temperature in summer or a fall in winter.
- Altitude i.e. areas that are many meters above sea level like the western highlands are very cold unlike the central low lands that are warm

- Prevailing winds i.e. the westerlies bring rainfall throughout the year to the Pacific coast and easterlies bring rainfall to the southeast especially in summer.
- Air masses i.e. the Polar continental from north pole brings cold and dry conditions with no rainfall to the interior,
  - Polar maritime from north pole blows over the Atlantic and Pacific brings cold and moist air with rainfall while,

- Tropical maritime from the Tropics brings warm and moist air causing rainfall.

NEW YORK

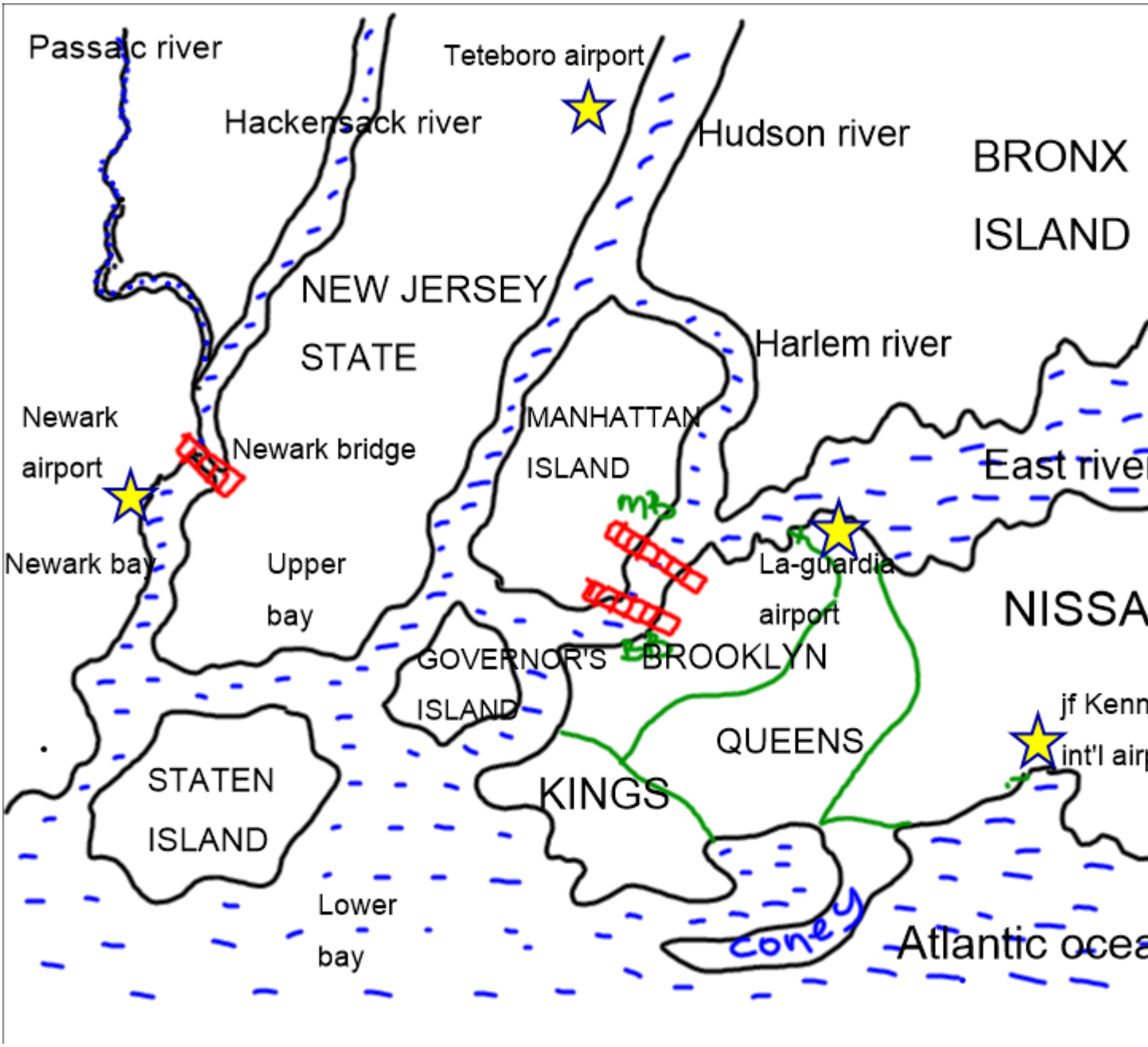
It is one of the largest urban centers in the world beside Rotterdam in Netherlands, etc drained by Hudson, Harlem and East rivers.

It comprises of five main islands surrounded by Connecticut, New Jersey state and Atlantic ocean.

That is;

- Long island

- Staten
- Governors
- Coney
- Manhattan



Factors for growth and development

- The sheltered natural harbor protected from the waves of the Atlantic
- Deep water suitable for sailing and anchorage of large ships
- Ice-free conditions allowing the use of the port throughout the year
- Low tidal range of less than 2 meters that allows port activities to be carried out thru out without disturbance.

- Numerous islands giving a lot of space for expansion e.g. Long island,Staten,Manhattan
- Rich productive hinterland of Great lakes region, Pennsylvania, New England that provides a variety of goods to be handled e.g. agricultural and industrial goods.
- Strategic location on the east coast of the American continent giving it easy accessibility.

- Located at the Hudson-Newark gap an important inlet to the Great lakes region and the Canada.
- Developed transport and communication networks like electronic railways, roads and Airports linking all the islands.
- Political stability in the region following the success of the American war of independence of 1786 that has enabled economic, social and cultural activities to go on peacefully.

- Big population that provided ready market for the products and labor to the industries and activities in the region.
- Historical factors like the coming of the early Dutch and British who engaged in trade and development.
- Diversity of functions e.g. headquarters of United Nations, commercial Centre, and educational Centre that attract many people in the area.
- Advanced technology allowing construction of

bridges and tunnels to connect to various islands.

- Flat relief providing ideal conditions for construction of sky scrappers and infrastructure.
- Presence of a hard basement rock providing a firm foundation for construction.

Functions of New York port.

- World's largest port handling imports and exports of USA
- Second largest industrial center after Tokyo in Japan having more than 45,000

industrial establishments in the region.

- Biggest financial center with a main stock exchange market at Wall Street
- Education center with colleges, universities, and technical/vocational schools.
- Cultural and entertainment center with museums, theaters, opera houses, etc.
- Administrative center with headquarters of international agencies like United Nations.
- Communication center with major international airports,

waterways, railways and roads.

- Tourist center with great potentials like the world trading Centre, statue of Liberty, pentagon etc.
- Residential center with thousands of people living in different apartments and improved hotels.

Problems

- Congestion due to heavy traffic hence delays of all activities.

- Pollution of air, water and land from heavy traffic, oil spills, industrial fumes, etc
- Limited land for expansion hence operations are at a smaller scale fetching low profits.
- Thick fog resulting from the cold Labrador current and warm Gulf stream causing invisibility that slows down activities.
- Slum development and limited accommodation arising from immigrants

- High crime rate due to limited jobs e.g. murder and theft.
- Heavy government expenditure on the citizen welfare due to unemployment hence little is left to develop other sectors.
- Racial descrimination/segregation amongst the people
- Delay in delivery and departure of goods/ services and passengers
- High cost of living in the area due to the dense population.

- High rate of prostitution due to unemployment.
- Easy spread of diseases due to congestion.i.e airborne and sexually transmitted diseases

Solutions

- Regulating travel and providing other avenues like subways to avoid heavy traffic.
- Vertical expansion i.e. building of sky scrappers to create room

- Proper treatment and disposal of industrial waste to reduce pollution
- Containerization to reduce port congestion and delay
- Strengthening of the police force to improve on law and order
- Politicizing the masses to reduce racial discrimination
- Restricting of immigrants to reduce population, congestion and unemployment

- Use of radars to monitor navigation and improve on visibility.

Industrialization in New York

- Textile industries mainly established in New Jersey area specializing in ladies clothing
- Chemical industries based on oil producing synthetic rubber, plastics, detergents, industrial acids, etc
- Printing and publishing industries mainly in central

Manhattan producing books, magazines, news papers, etc

- Engineering industries dealing in ship building and repair, engines, motor vehicles, locomotives, etc
- Food processing/Beverage industries dealing in soft drinks, processing tea, cocoa, coffee, etc

Factors

- Skilled, semi-skilled and unskilled labor by natives and immigrants

- Coming of white settlers like Germans, British, Spanish, Jews who provided capital and skilled labour.
- Large market base for industrial products within New York and outside USA.
- Well developed and efficient transport and communication networks
- Abundant raw materials like iron ore and wood
- Abundant power like hydro, petroleum, coal and nuclear used for lighting and running machines.

- Adequate capital to buy industrial inputs got from the settlers and the government.
- Technical education providing skilled labour
- Strategic location on the east border near the greater hinterland of Europe, Africa
- Large\ extensive land to construct industries
- Political stability that welcomed both native and foreign investors
- Positive government policy to industrialize New York by

giving investors tax holidays and land at a subsidized price.

- Advanced technology for transforming raw materials into finished goods

Importance

- Employment opportunities to the industrialists like machine operators, drivers etc.
- Good quality industrial consumer goods
- Skill acquisition in operating machines, marketing, packing etc.

- Earning income by the worker thereby improving the standards of living
- Improved transport and communication networks to transport industrial goods and raw materials.
- Foreign exchange is earned by the government thru the export of clothes, automobiles to other countries.
- Revenue by the government through taxing industries and workers hence development of other sectors like roads.

- Urbanization in the region e.g. New Jersey
- Reduction in the importation of industrial goods that can be made with in New York
- Exploitation of natural resources for the good of the people e.g. minerals and land.
- Pollution of the environment i.e.water,air and land.
- Occupation of too much land that would be used by other investors.
- Displacing people in their native land

- Producing harmful products that affect human life

MANHATTAN ISLAND

It forms the heart of New York city and was first inhabited by the Red Indians who were replaced by the Dutch calling it New Amsterdam in 1624. Later the British took it over and referred to it as New York after their homeland town.

Factors for development

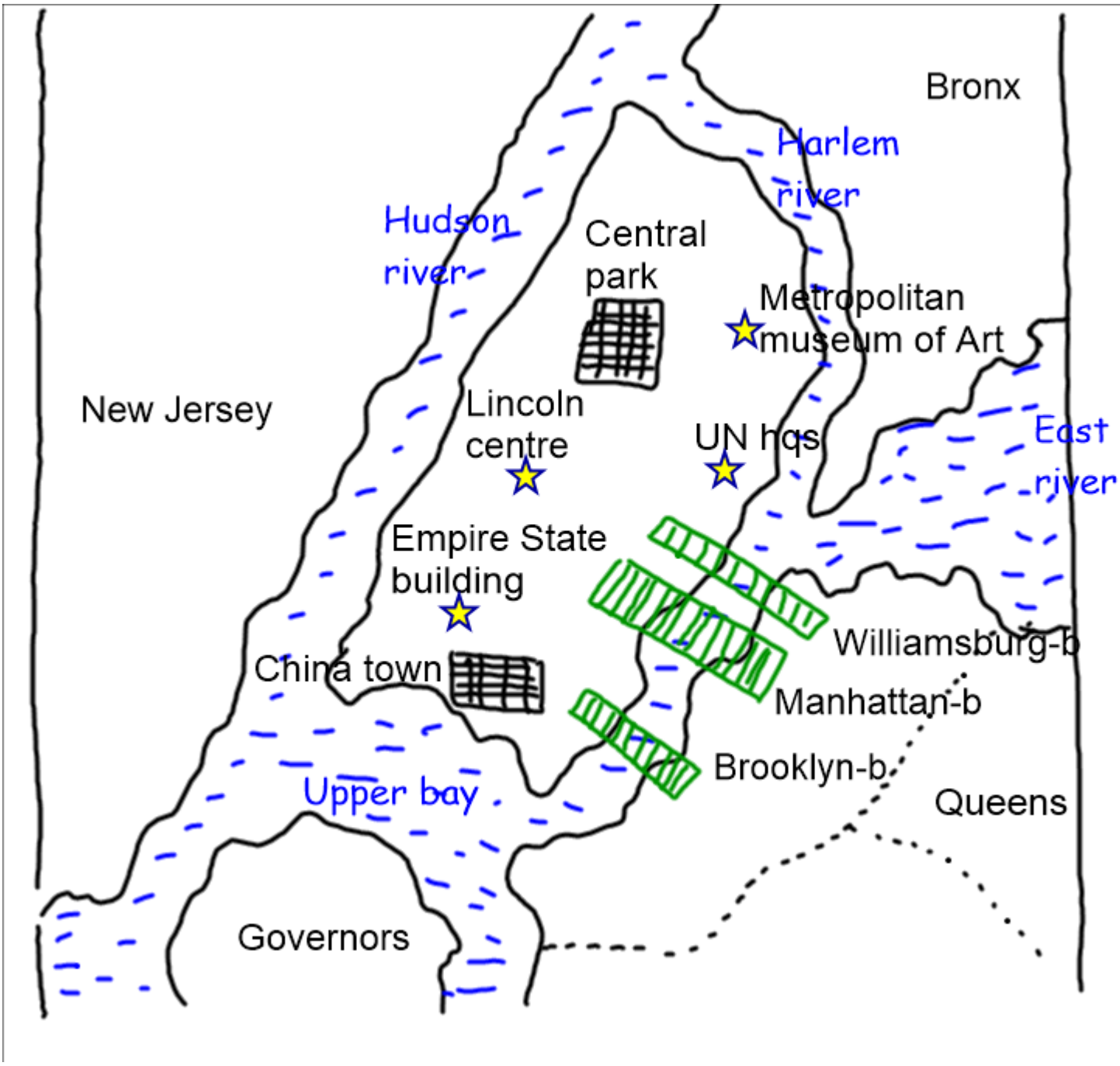
- Security because it was surrounded by water hence, it

was very hard for it to be attacked.

- Fresh water for domestic and industrial use from rivers East and Hudson
- Fertile silt on the river banks for agriculture
- Conducive climate that encouraged human settlement
- Deep water of the surrounding rivers like Hudson, Harlem, East that eased water transport.
- Ice-free conditions favoring settlement and economic activities thru out the year.

- Political stability that encouraged many investors to move to Manhattan
- Land that was readily available for infrastructure development.
- Immigrants that brought innovations e.g. the Dutch and British.
- Improved transport and communication for accessibility e.g. roads, railways and Airports

A sketch map of Manhattan Island



Problems (consider those of New York)

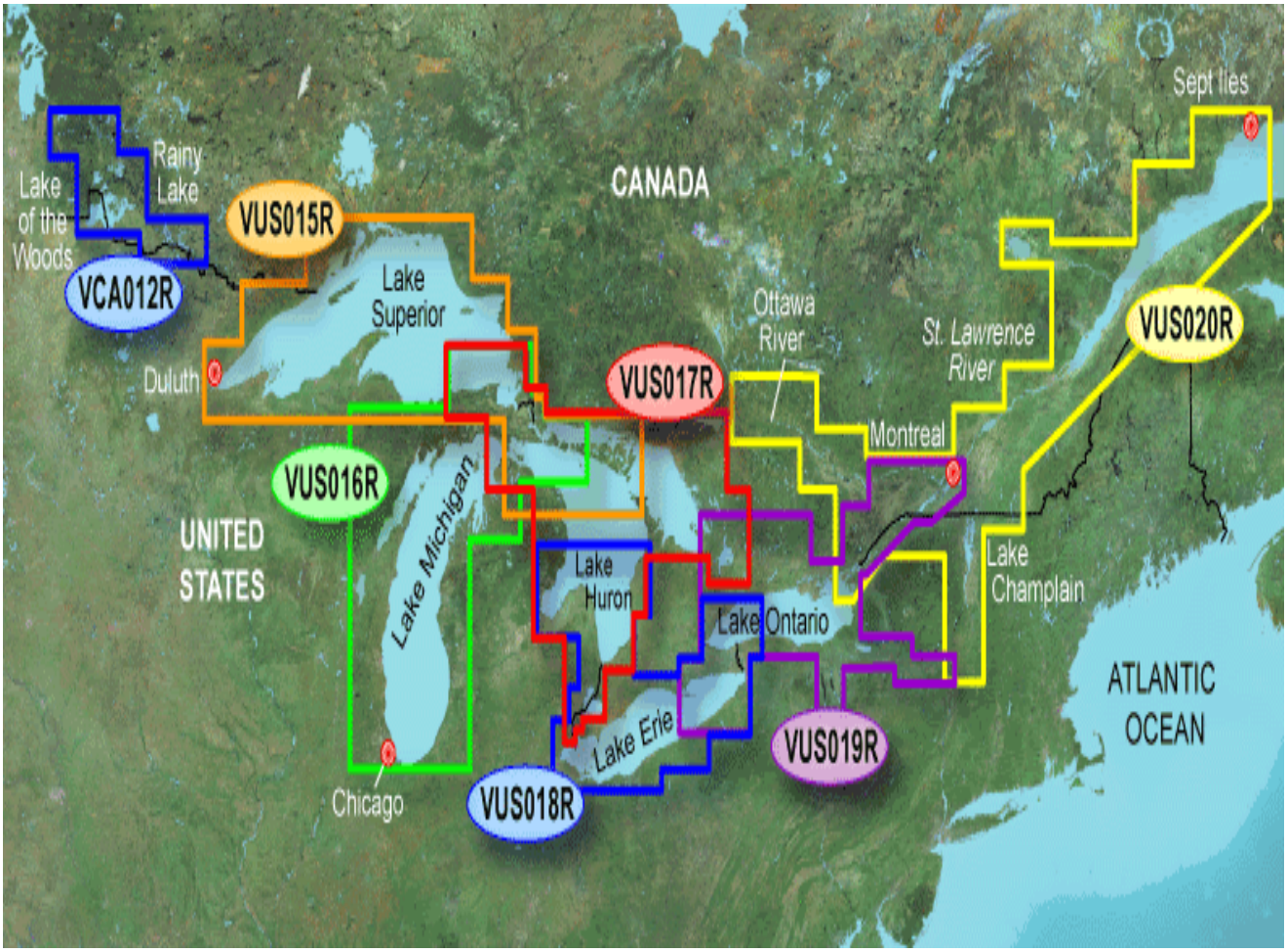
GREAT LAKES REGION AND ST.LAWRENCE SEA WAY

A huge engineering project started in 1954 till 1959 to create deep water navigation between L.Ontario and Montreal town. It stretches from the Great lakes region (L.Superior) up to the Atlantic Ocean in the east. Involved the construction of 2 power dams and employing over 2200 men. The project costed around 100 million dollars shared by

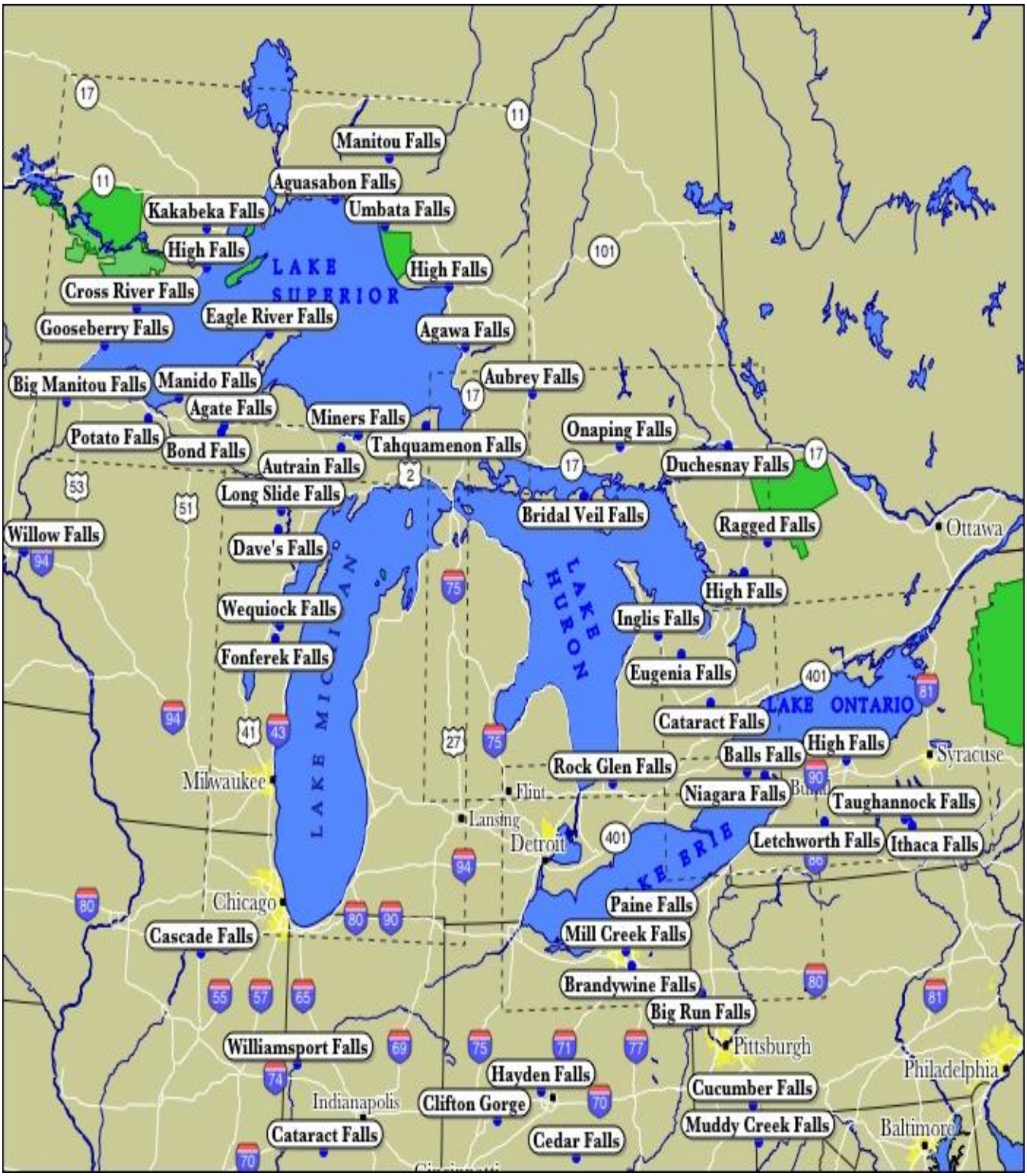
Canada and USA. After completion, ocean going ships were able to sail for the first time from the mouth of St. Lawrence river to the western shores of lake Superior covering 3800 km (8.5 sailing days). It has 25,750 km^2 of navigable water, major international ports and 50 smaller regional ports.
It basically operates from March to late December due to ice during winter.

St Lawrence Sea way

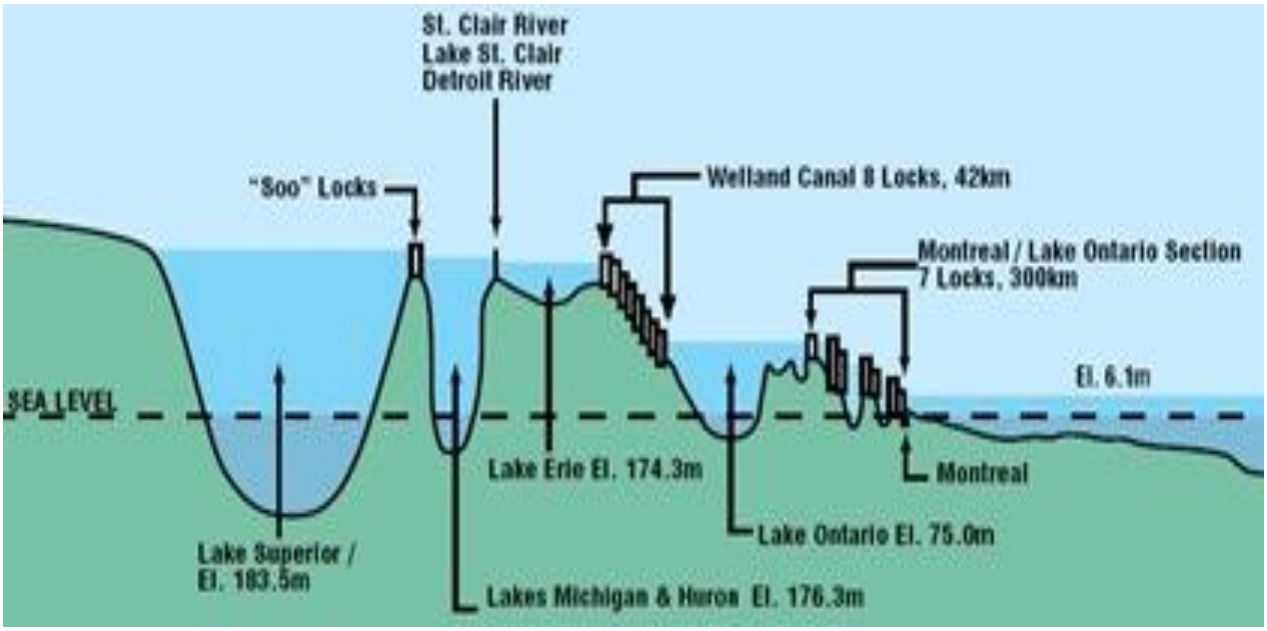
A sketch map of St Lawrence Sea way region



A sketch map of the Great Lakes showing major falls



A cross section through the St. Lawrence sea way-Great Lakes region



Objectives/ Aims

- To create deep water for ocean going ships
- To generate enough power like at Ontario and Hamilton
- To industrialize the region
- To provide employment and improve standards of living
- To provide an alternative route for the northern route of Canadian wheat
- To link the interior to the ocean

- To ease transportation of bulky/ heavy goods via water
- To control floods in the area
- To enhance international co-operation between USA and Canada

Problems before and during construction

- Severe winter freezing for 5 months
- Narrowness of 1 km wide
- Drowning of 6 villages in the formed lake
- 225 farms had to be transferred
- The Canadian national railway that covered the lower southern Canada
- Opposition from USA that still wanted to tax exports and imports through New York
- Competition from Buffalo and Montreal ports that did not want other

ports to develop along the Great lakes region

Shipping hazards

- Severe winter freezing
- Waterfalls and rapids e.g Lachine and Niagara falls
- 300km bottle neck against sailing of big vessels
- Shallow waters that would not allow large ships to sail.
- Rocky thousand islands section
- Silting of the sea way
- Winter navigation above Montreal was hard
- Recommended vessel capacity was only 12,000 tones'
- Fog during spring that affects visibility and navigation
- Narrow river at 1km width above Quebec city

- Water fluctuations during the different seasons
- ¯12º C January temperatures causing jumbled ice in the water way

Solutions

- 300km bottle neck was widened and deepened to 8.2m followed by the construction of water channels and several locks
- The thousand islands section (shoal) was blasted away
- Rapids and falls were reduced by building tunnels and dams
- Freezing was reduced by using ice-breakers on the sea way
- Dredging of the river from Kingston to Montreal
- Building of locks to regulate water levels and allow large ships sail e.g. at Bahattdam and Iroquois

- Co-operation between USA and Canada was enhanced there by meeting the construction and maintenance costs

Commodities transported

- Crude oil
- Wheat
- Metallic ore
- Iron ore
- Coal
- Machinery
- Timber
- Dairy products

Contribution

- Cheap water transport was availed to the natives
- Exploitation of natural resources e.g. coal from Pittsburg.

- Reduced distance and costs of travel
- High industrialization by bringing and distributing raw materials and manufactured goods respectively at Kingston, Buffalo and Montreal
- Development of other ports like Dulluth, Chicago, etc
- Electricity production at Beauhanois and Barnhort i.e,hydro electricity was produced which boosted industriaisation.
- Numerous tunnels and locks were constructed
- Relations between USA and Canada were improved.
- Promotion of trade between USA and Canada that boosted their economies.
- Many employment opportunities were created i.e. the captains of ships, industrialists, miners etc.

- A lot of revenue to the governments of USA and Canada from the taxes and licenses collected from the users of the sea way.
- Tourism was greatly developed that earned the USA and Canada governments a lot of foreign exchange.
- International trade and relations were developed and improved between Canada and USA plus other countries using the sea way.
- Improvement in agriculture along the river banks

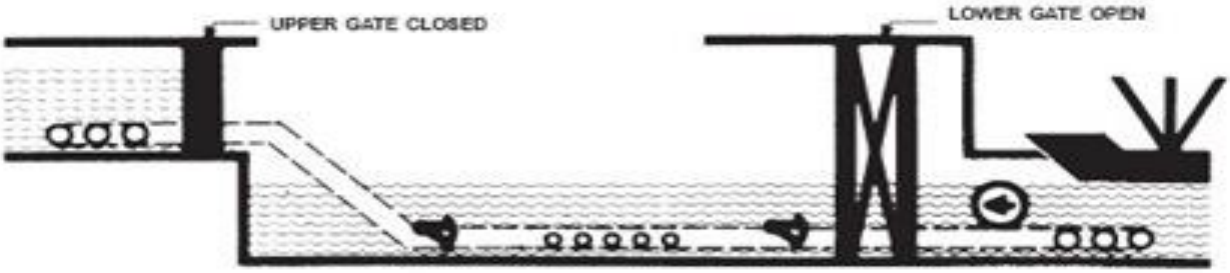
Problems still being faced

- Silting of the river valley
- Freezing of the water during winter
- Delays in travel of passengers and goods due to congestion
- Fog which affects visibility and navigation

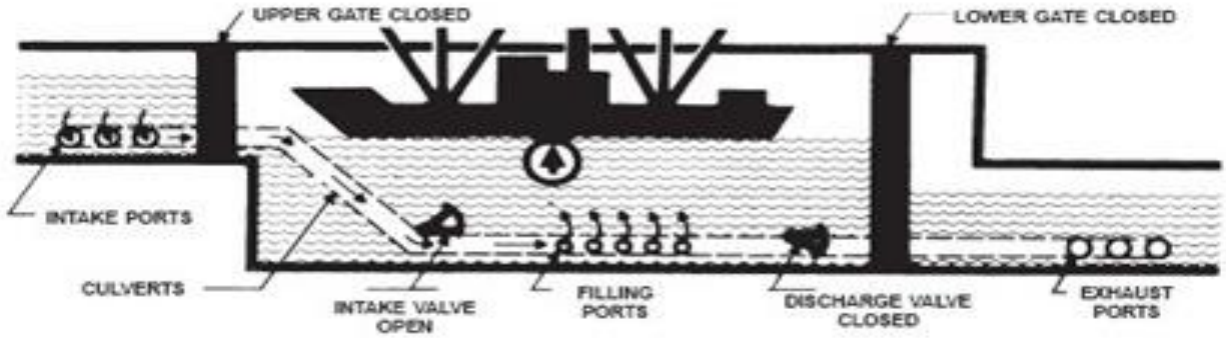
- Traffic congestion due to high population in the area both for goods and human beings.
- Locks are still narrow and canals shallow depending on the goods and vessels to travel
- Flooding during the rainy season affecting transportation
- Long Sault rapids between Superior and Huron
- Long stretch of shallow water limiting a number of ships traveling

A sketch map showing St. Lawrence sea way before and after construction

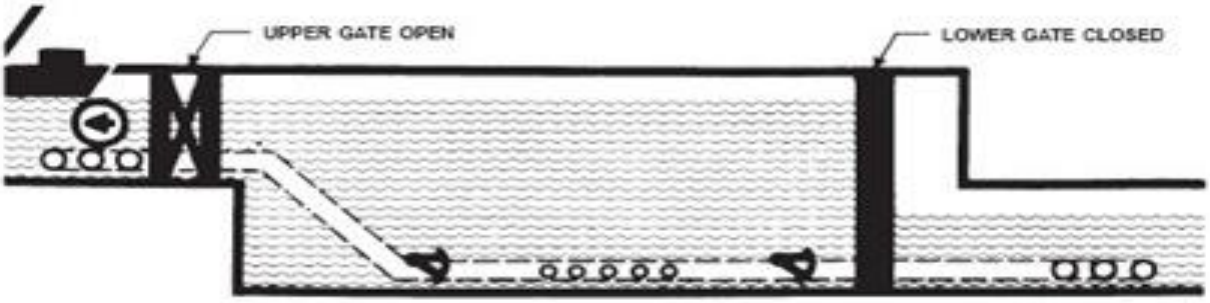
STEP 1 SHIP ENTERING



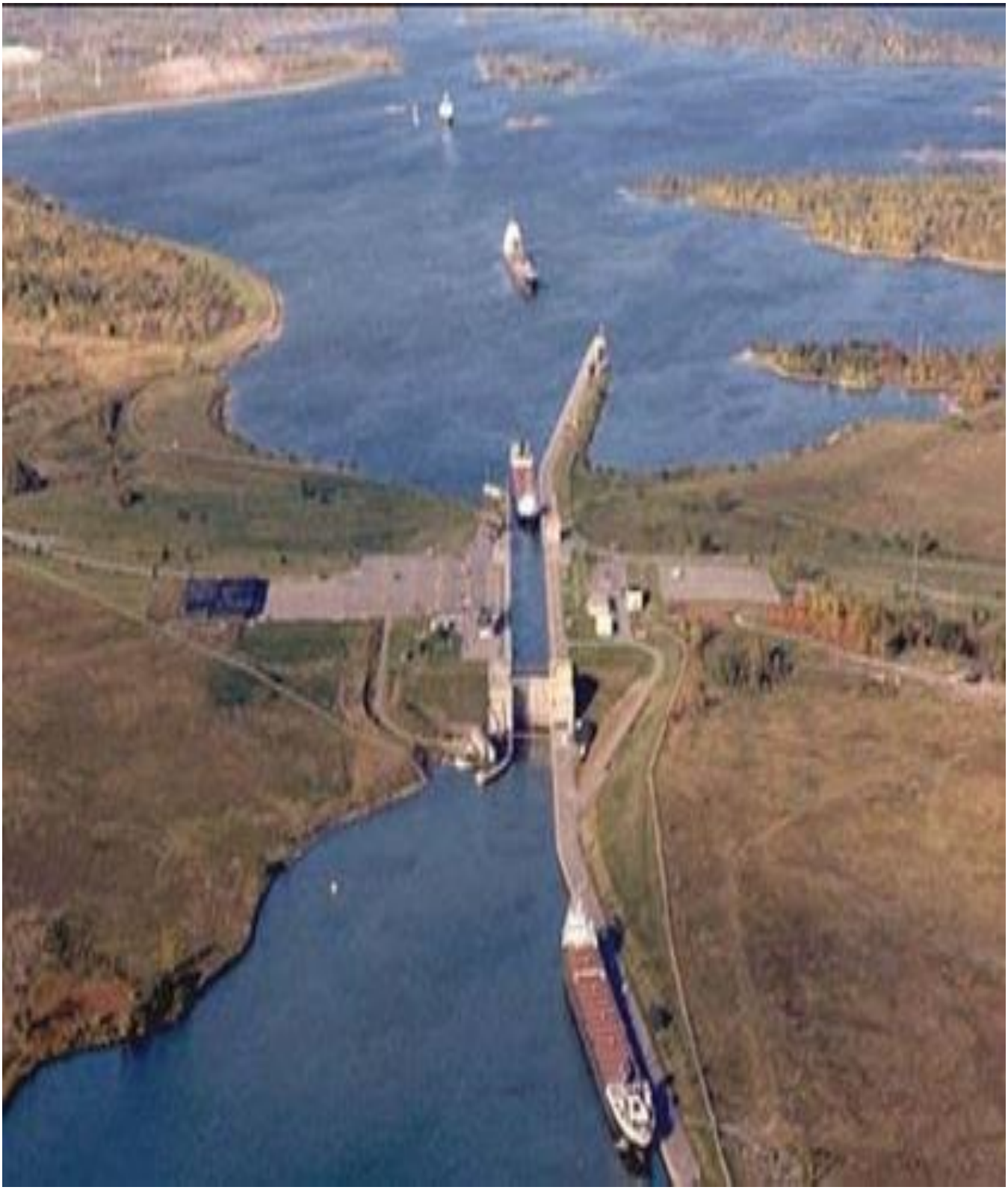
STEP 2 FILLING OF THE LOCK



STEP 3 SHIP LEAVING THE LOCK



A visual image of the St. Lawrence Sea way canal



Industrialization in the Great Lakes region

This region comprises of 5 major lakes i.e. Superior, Huron, Michigan, Erie and Ontario.

Following the construction of the St. Lawrence Sea way (between lake Ontario and St. Lawrence bay), there was rapid industrial development due to mineral discovery (iron ore near lake Superior and coal in the Appalachian mountain) and technological advancement.

Types of Industries

- Iron and Steel using iron ore from around lake Superior and Sevens island and coal from Pittsburg and Pennsylvania. This led to engineering industries, manufacturing industries for cars, agricultural machinery making, etc
- Paper industry especially near the coniferous forests of Ottawa and Quebec leading to saw mills, printing and publishing, etc

- Food processing industry like fruit canning, grain milling, meat packing, making cigars and cigarettes.
- Chemical industry making fertilizers, detergents, synthetic fibres, etc

Industrial Towns

- Cleverland having textile, steel works, ship building, synthetic fibre making, etc
- Buffalo having engineering, iron and steel, chemical, textile, etc

- Detroit having steel works, automobile, engineering, car assembly, etc
- Toronto having steel works, engineering, automobile, textile, food processing, saw milling, etc

Sketch map showing industrial towns.

Factors that favored industrialization in the Great Lakes region.

- Abundant hydro electricity power to run the machines

- Strategic location in the place with minerals, water transport, etc
- Abundant raw materials for industries like iron ore, tin, coal, gold, agro-produce and water.
- Adequate/large sums of capital to buy the industrial inputs
- Cheap/abundant skilled labor to transform raw materials into semi/finished goods
- Developed transport and communication networks linking the industries with

raw material centers and markets

- Large market/ready market within the Great lakes region and abroad.
- Positive\supportive government policy that encouraged industrialization of the region.
- Extensive land upon which industries are built.
- Technical biased education providing skilled industrial laborers
- Advanced technology used to make industrial products with

efficiency i.e. machines that can do work of many people.

- Abundant water supply from the great lakes to act as a coolant and raw material

Problems being faced by industrialized cities

- High rates of pollution from industrial waste i.e. water, air and land pollution.
- Slum development as people seek for employment
- Traffic congestion in the area due to dense population and cars causing delays.

- High levels of unemployment causing idleness
- High crime rate in the region due to unemployment e.g. murder theft and robbery, drug abuse.
- High cost of living
- High government expenditure in the provision of social services like hospitals and schools.
- Deforestation/environmental degradation as more land is required for industrial development, settlement and timber

- Exploitation of labor as many people are seeking for means of survival
- Over utilization of the natural resources hence exhaustion.
- Production and sale of harmful products e.g. nuclear weapons, guns etc.
- Depriving other sectors of land to carry on other activities.
- Bringing about Rural-Urban migration as many people search for jobs near industries.

Importance

- Many people have been employed in the area as drivers, accountants and marketeers.
- A lot of foreign exchange is earned by the government through the export of industrial products to other countries.
- Improved transport and communication networks like railways, water and road transport.
- Urbanization. like Detroit,cleverland,Chicago

- A lot of revenue to the government through taxation and licensing.
- Skill acquisition by the workers in management, machine operation hence improving their status
- Earning of a lot of income by the workers thereby improving their standards of living
- Reduction in the importation of industrial products

(A sketch map of the Great Lakes region showing major lakes, rivers and towns)

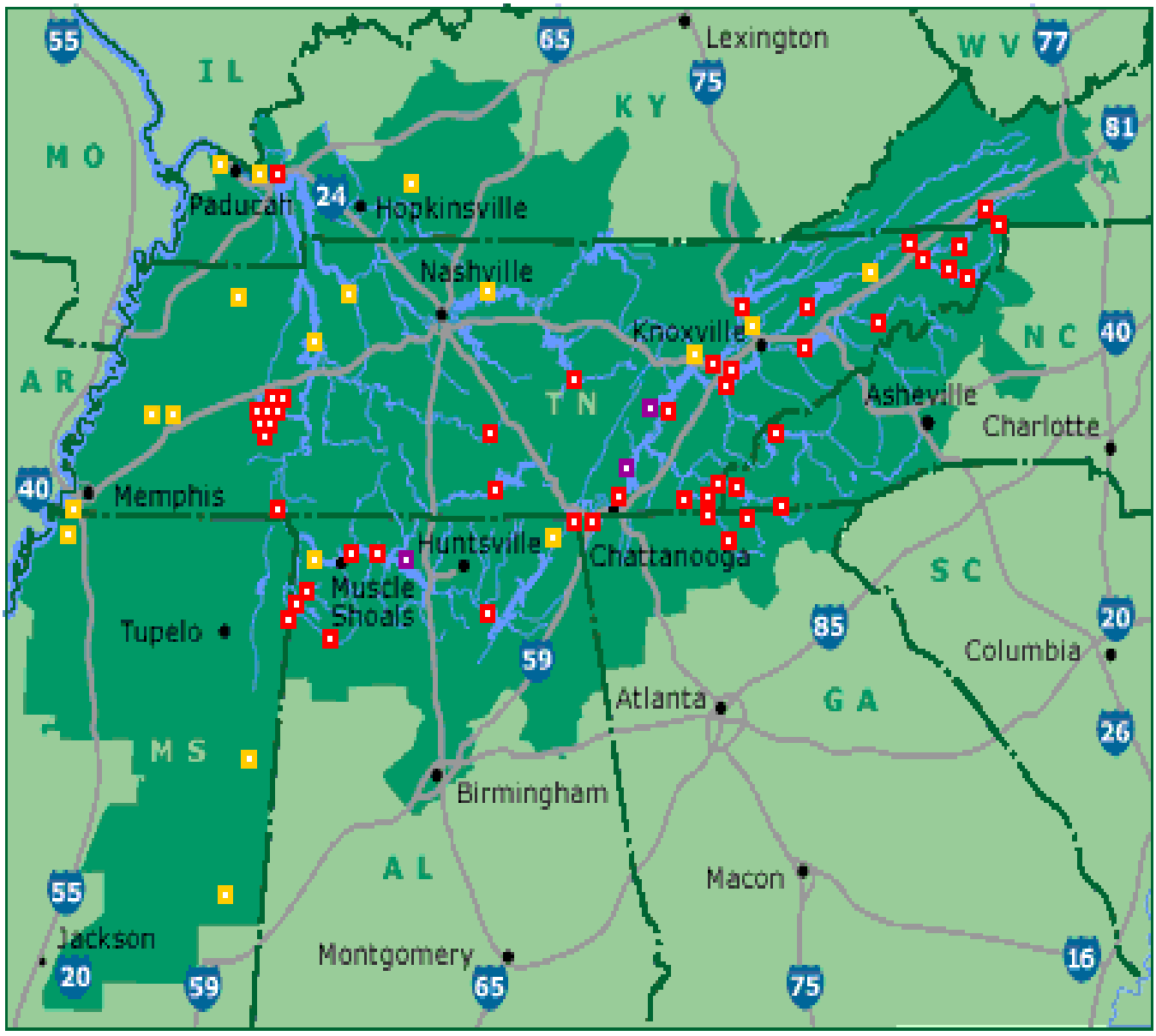
TENNESSEE VALLEY AUTHORITY

A corporation formed for the large scale rehabilitation of the vast unbalanced Southern states like Tennessee, Kentucky, Mississippi, Alabama, Georgia, Virginia, North Carolina, South Carolina, etc

By 1933, president Franklyn Roosevelt was elected head of

USA and initiated the project in the poorest Tennessee region.
River Tennessee is a sub-tributary of river Mississippi with its source in the Appalachian mountains. Other rivers are Ohio, Cumberland and Alabama.

A sketch map showing the Tennessee Valley Authority



Problems faced before

The valley area had several problems like

- Soil erosion due to poor farming, steep slopes and high population
- Drought and famine in the region
- High level of poverty
- High unemployment
- Increased population
- Diseases like malaria, bilharzia, etc
- Limited fuel resources due to deforestation
- Poor transport due to river flooding
- Poor housing facilities coupled with poor sanitation

- Silting of river Tennessee and other tributaries making the channels shallow and unnavigable
- Shallow channels not leading water into the other lakes causing flooding
- Occasional flooding causing destruction
- Swamp reclamation due to high population
- Limited funds after 1916 causing a standstill of the project

Dam construction at the TVA

Aims/ Objectives

- To build dams and control flooding
- To generate hydro electricity power
- To control soil erosion
- To reclaim badly eroded land

- To teach local people better farming methods
- To improve on transport and communication
- To conserve wild life i.e. fauna and flora
- To control population growth
- To control disease spread in the area
- To promote industrialization
- To promote forestry through afforestation and re-afforestation
- To improve on the housing facilities.

Achievements

- Dams were constructed to control river flow, improve navigation, provide power and irrigation water like Fontana, Norris, Hiwassee, Fort London, etc
- River Tennessee was made navigable through dredging (removal of silt from the river).
- Hydro-electric power was produced in abundance due to the construction of the dams.

- Viable infrastructure was set up in the region e.g. roads and railways
- Floods were controlled and their destruction effect reduced
- Soil conservation measures were introduced like mixed farming, afforestation, demonstration farms, mulching, etc

Benefits

- Disease control through directing water into the water

reservoirs to kill mosquito larva

- Cheap power for domestic and industrial use was provided through the construction of dams.
- A lot of foreign exchange earned through increasing on exports like power, fish products
- Cheap transport provided by constructing roads and railways plus airports and water ways.
- Floods were controlled by building many dams.

- Many employment opportunities in the farms, industries, dams construction.
- A lot of income was earned by the workers hence improving on standards of living
- Large water reserves were constructed for irrigation water and fishing
- Mineral mining in the region like coal at Pittsburg
- Tourism promoted due to the existence of dense forests, dams, wildlife.

- Resettlement of over 10,000 people
- Tennessee became a model for development and initiated other projects in USA.
- Promoted soil conservation thereby encouraging agriculture by teaching farmers better farming methods like agroforestry, terracing.
- Social infrastructures were set up like schools, hospitals they improve on the standards of living of the people around.

CANADA

Found in the northern territory of the North American continent. It’s the second largest country after Russia with 28 million people and a capital at Ottawa.

It is bordered by Alaska (USA) in the northwest, USA in the south and Greenland in the northeast.

It is also bordered by the Arctic sea, Beaufort sea, Hudson bay and Labrador sea in the north, Pacific ocean and Gulf of Alaska in the west, Great Lakes in the south and Atlantic ocean plus Gulf of St. Lawrence river in the east.

Latitudinal approximation is 53°W to 143°W and 42°N to 83°N having land coverage of 9,976,739 km^2 with 9,085,576 km^2 as land and 891,163 km^2 as water.

Canada is made up of many provinces such as British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nunavut, Newfound land and Labrador, New Brunswick, Nova Scotia, Yukon and Northwest territories.

Relief

Canada is basically mountainous in the west and low land in the southeast with many ranges like;

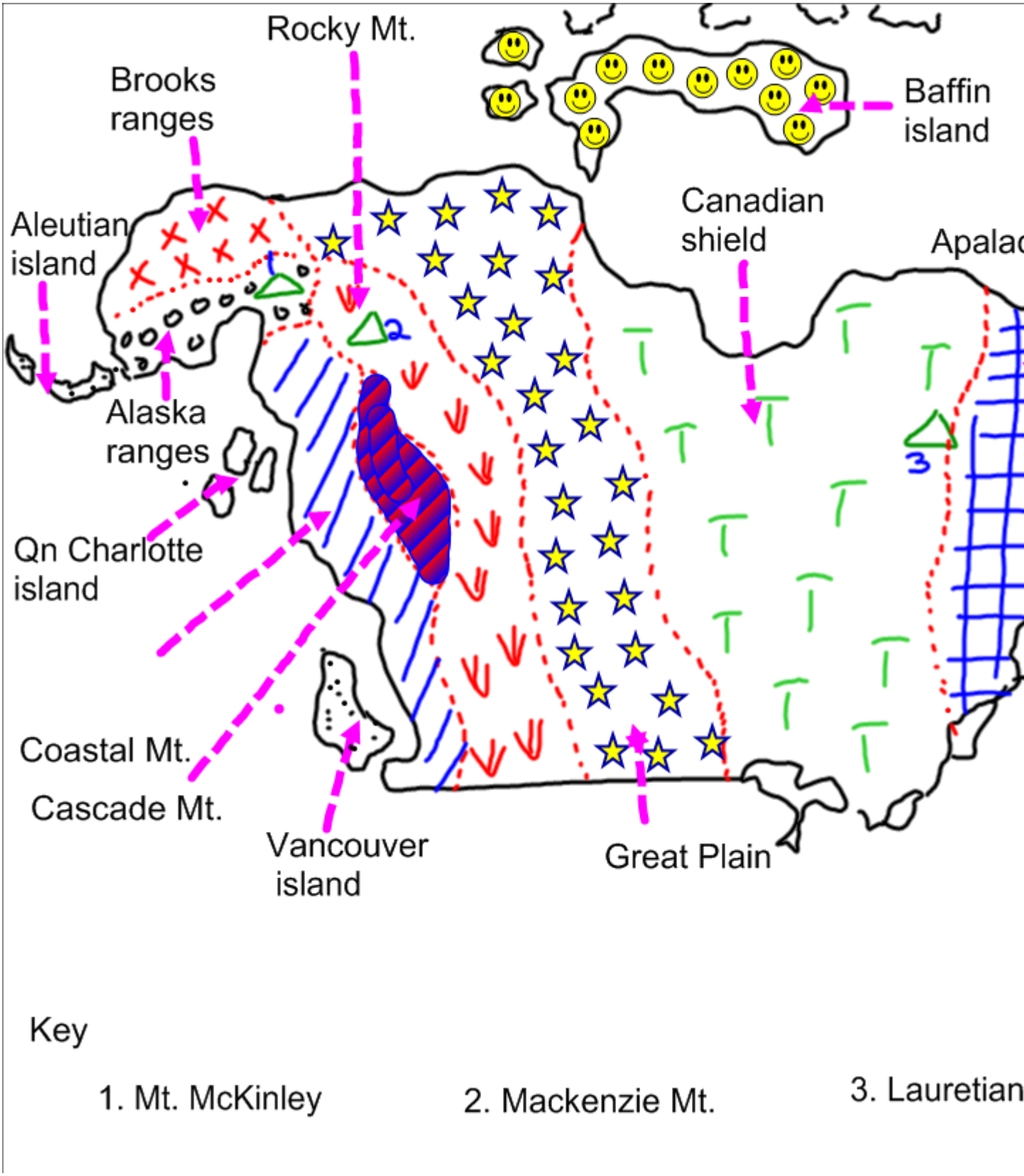
- Coastal ranges, Cascades and Rocky mountains in the west

- The Great plain covering the central and southern parts
- The Canadian shield covering the northern region
- Appalachian mountains in the east

Relief subdivisions are;

- Appalachian mountains in the east making eroded range of mountains
- Great lakes and St. Lawrence lowlands in the south with rich sedimentary plains
- Canadian shield in the north with eroded hilly terrain/landscape

- Canadian interior plains with sedimentary rocks
- Western cordillera stretching from the Rockies to the Pacific with plateaus and valleys
- Pacific ring of fire with many young volcanoes (around 200) between Cascade ranges to Yukon
- Canadian arctic with permanent ice and permafrost


Rocky Mt.
Brooks ranges
Baffin island
Canadian shield
Aleutian island
Alaska ranges
Qn Charlotte island
Coastal Mt.
Cascade Mt.
Vancouver island
Great Plain
Key
1. Mt. McKinley
2. Mackenzie Mt.
3. Lauretian

Drainage

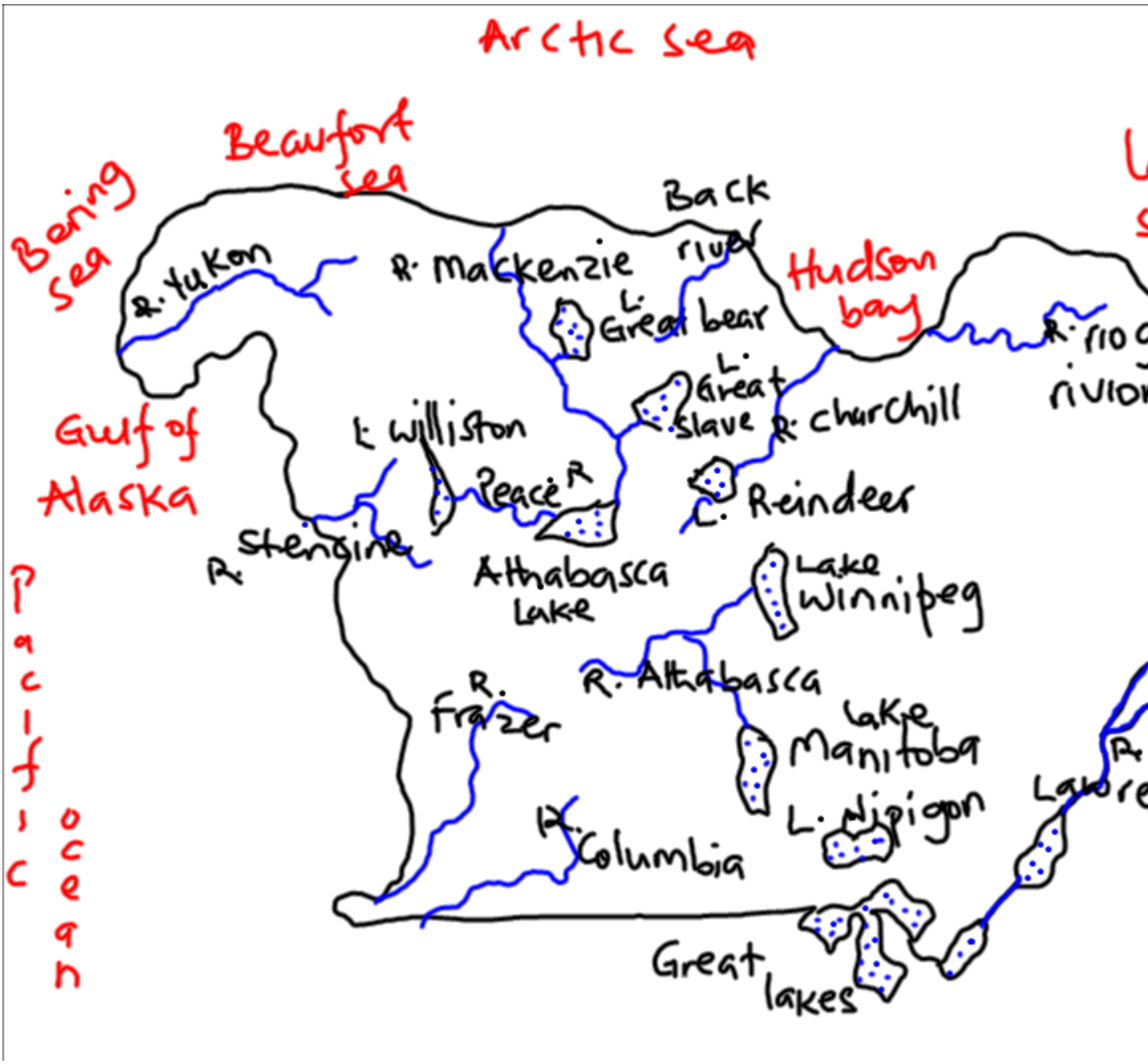
Canada is endowed with many rivers and lakes which include;

- River Yukon streaming through Alaska to the Pacific ocean or Bering sea
- River Mackenzie flowing into the Arctic sea or Beaufort sea
- River Churchill flowing into the Hudson bay
- River Columbia streaming through USA into the Pacific ocean
- River Fraser flowing into the Pacific ocean

- River St. Lawrence streaming from the Great lakes into the Atlantic ocean
- River Ottawa joining river St. Lawrence into the Atlantic ocean

And also lakes such as;

- Great Bear lake, Great Slave lake, lake Manitoba, lake Winnipeg, lake Reindeer, Athabasca lake, Williston, Wollaston, and the Great lakes, etc



Climate

The country is dominated by cold Temperate in the north, south, central and eastern parts having long very cold winters and short mild warm summers;

cool Temperate western margin mainly in the west having cool mild wet winters and mild

warm summers receiving cyclonic rainfall; Tundra basically in the northwest having long cold winters and cool summers receiving light rainfall full of snow fall with Sub-arctic or arctic in the north.

Table showing land use

Land use	Percentage
Arable land	5
Permanent crop	0
Permanent pasture	3
Forest and woodland	54
Others	38

Vegetation

- Canada is dominated by the temperate grass land in the central and southern parts (prairies) together with coniferous and deciduous forest cover that is dominant in the west provinces of British Columbia, Yukon and Northwest territories. As for the

east it’s dominated with temperate grass land and scattered coniferous trees.

A sketch map of Canada showing drainage and other features

CANADIAN PRAIRIES

The term ‘Prairies’ means ‘meadow’, a type of grassland of temperate kind in the central parts of North America.

The prairies extend from Canada in the north southwards to northern USA being the most important wheat growing area in the world accounting for 20% of the world’s wheat covering one-fifth of Canada’s territory and found in 3 provinces i.e.

- Alberta
- Saskatchewan
- Manitoba

The southern part extends to north of Dakota, South Dakota, Minnesota and Montana.

Relief

The area has undulating topography on the west side from the Rocky mountains and descends in height eastwards. This is well drained and supports agriculture. That is, lies in an area of nearly horizontal sedimentary rock between the Canadian shield and the Rocky mountains

(A cross section of the Canadian Prairies relief)

Climate

It experiences cold Continental climate characterized by long cold winters, warm sunny summers with rainfall of 500mm which reduces towards the rain-shadow of the Rockies in Alberta.

It is also influenced by air masses like the polar continental from the Arctic region bringing cold and dry conditions.

The tropical maritime from the Mexican Gulf bringing warm, wet and rainy conditions in summer

The Chinook winds from the Pacific ocean blowing across the Rockies bringing dry conditions.

Soil

The Canadian prairies have dark brown soils which are not acidic. i.e. having a lot of potassium and phosphates which are good for wheat growth.

Drainage

It's is well drained with many rivers and lakes streaming from the Rocky mountains, Canadian shield, etc providing the required water needed.

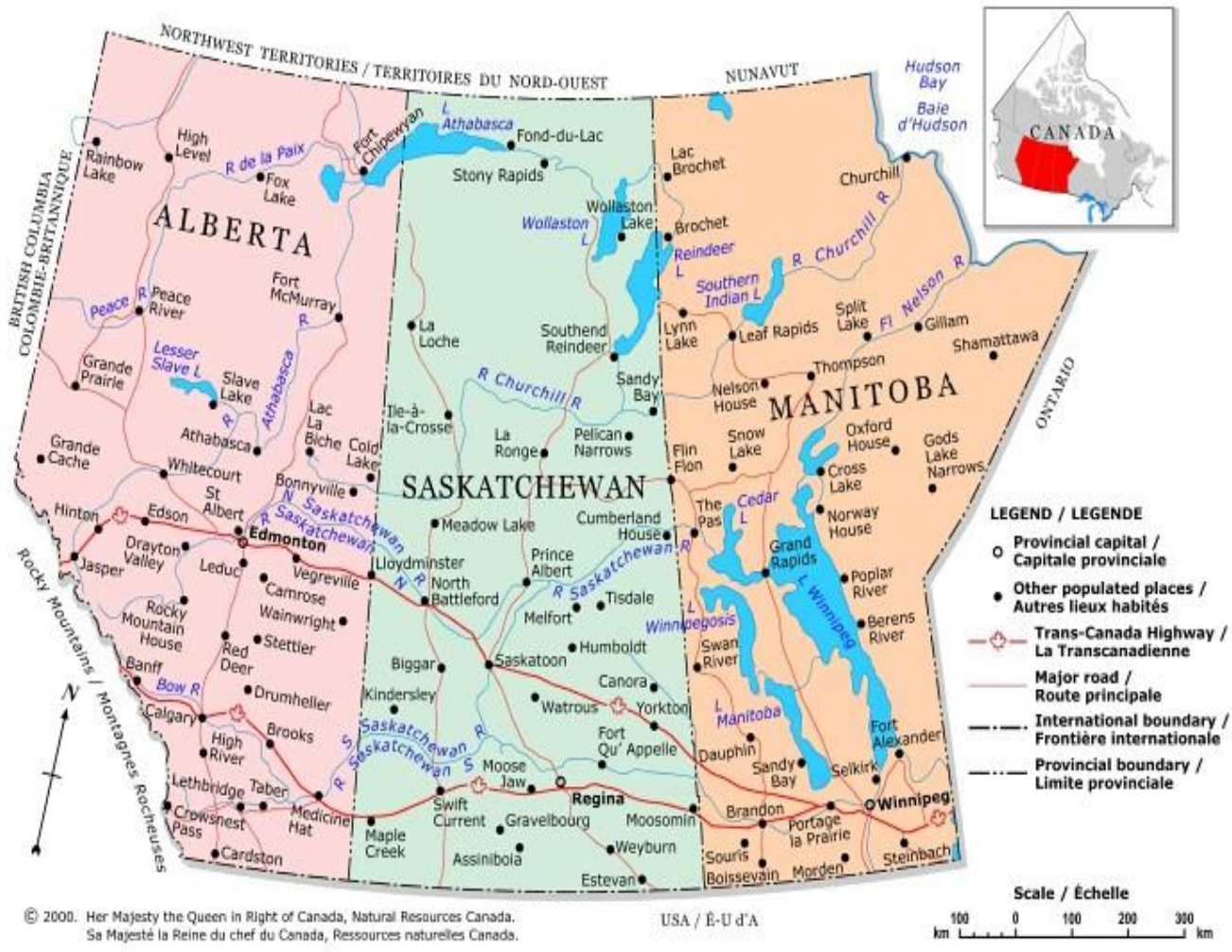
- River de la paix, Peace and Athabasca flowing into lake Athabasca.
- River Saskatchewan, Assiniboine and Red flowing into lake Winnipeg
- River Churchill flowing into Southern Indian and Reindeer lakes extending into the Hudson bay
- River Nelson flowing into the Hudson bay
- River Bow joining river Saskatchewan flowing into lake Cedar

And major lakes in the Prairies include;

- Lake Fox and Lesser Slave in Alberta province

- Lake Athabasca, Wollaston, Reindeer in Saskatchewan province
- Lake Winnipeg, Cedar, Winnipegosis, Manitoba and southern Indiana in Manitoba province

A sketch map of Canada showing the Prairies extent



Types of farming

- Dry farming- even in Canada with less evaporation than East Africa, 400mm is a low rainfall. Most farmers practice fallowing over a year .i.e. the land is left to regain and stores up the year's moisture for the next year's crops. Fallow land is often cultivated to kill weeds which would use up the valuable moisture and nutrients.
- Mixed farming- with increasing wheat supplies, many prairie farmers have resorted to mixed farming where crop cultivation is combined with animal rearing. The grass and poor wheat grade from the prairies is used to feed the animals while the good quality wheat is exported and animal waste is used to fertilize the soil. This involves crop rotation where wheat, barley, oats are interchanged with grass crops-hay, peas and flux.

- Ranching- more in the west (Alberta province) lying in the rain shadow area with low rainfall and dryness i.e. leeward side of the Rockies. Ranches are big and divided

into paddocks rearing beef cattle with major selling centers at Calgary and Edmonton. This was favored by

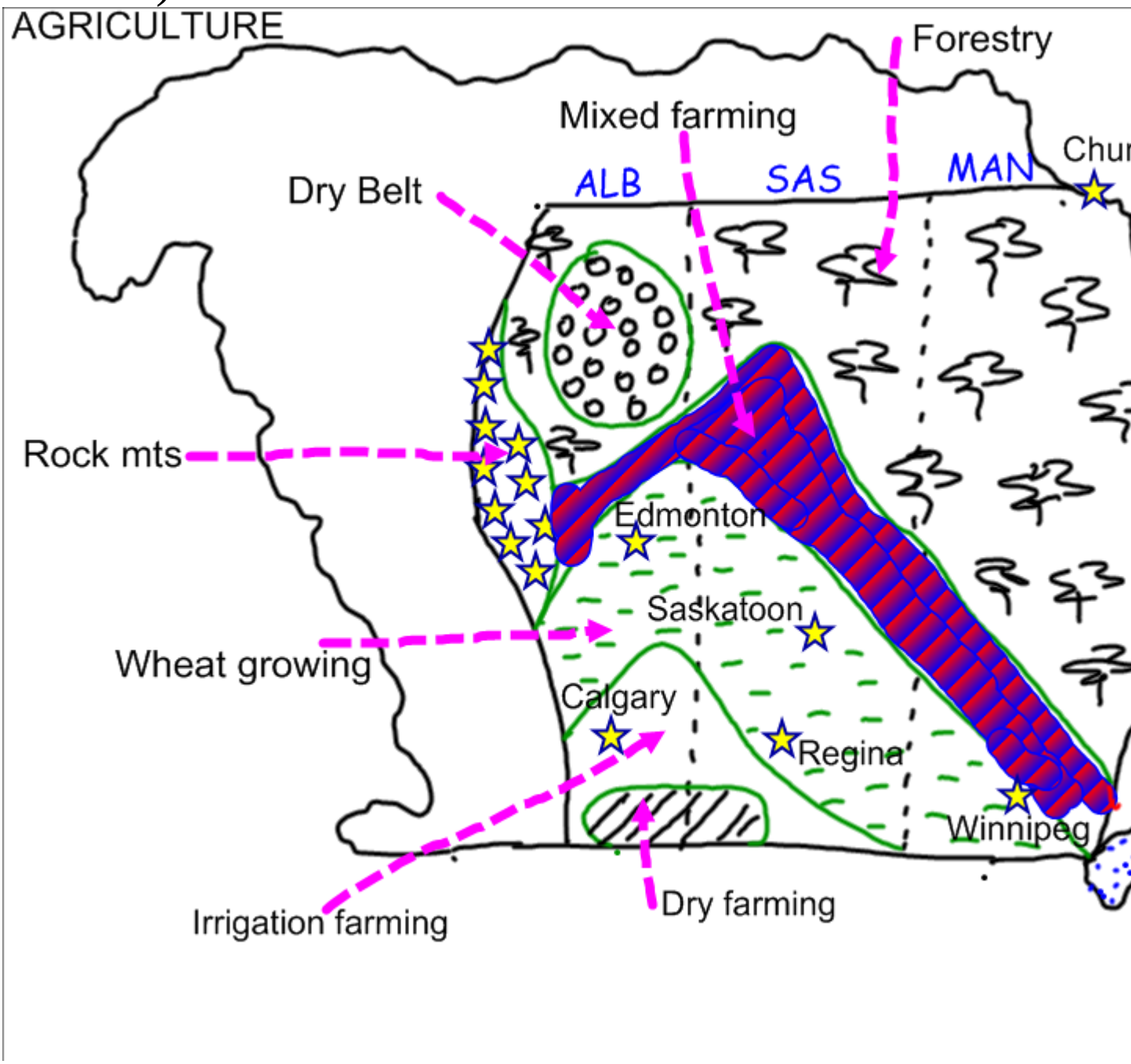
- Low unreliable rainfall
- Large tracts of empty land
- Short nutritious grass
- Cool winters and warm summers allowing all-year outdoor grazing
- Relatively flat land for large ranches

- Extensive farming- cultivation is done on a large scale using machines to grow cash crops. Basic machines used are seed dicer for ploughing and planting the crops; swather for cutting the wheat to dry the seeds; combined harvester for collecting grain, threshing it, scattering the straw, hovers the field and delivers the grain in the trucks and aeroplanes for spraying the crops.

- Intensive farming- cultivation is done on a small scale but with great output. It involves using much labor, scientific methods like

fertilizers and mainly practiced in towns or cities.

(Sketch map showing farming patterns in the Prairies)



Canada grows a variety of wheat species such as durum, spelt, winter wheat, red fife and marquis wheat.

A sketch map showing land use patterns on the Prairies

Conditions that favored wheat growing

- Extensive land in southern Canada where wheat is grown.
- Undulating/gently sloping landscape/relief suitable for mechanization
- Fertile black chernozom soil conducive for wheat growing

- High summer temperatures that are conducive for the growing and ripening of the grain
- Adequate rainfall of about 500mm during the growing season
- Chinook wind that makes the winter snow to melt and add moisture in the soil in spring
- Grassland vegetation that was easy to clear
- Well developed transport and communication networks for delivery e.g. roads, railways and waterways.
- Large sums/adequate capital to buy farm inputs, process the wheat and export it
- Larger/ready market base with in Canada and the outside world
- Advanced agro-technology like the use of the combined harvester that make work very easy.
- On-going scientific/agricultural research that provided good seeds that are high yielding and resistant to unfriendly weather
- Skilled labor in farm management, processing, machine operation, etc

Characteristics of Farms

- Large with thousands of hectares
- Extensive farming is practiced
- Highly mechanized i.e. seed dicer, combined harvester, swather
- Monoculture i.e. growing of one crop on large land
- Scientifically managed by using a variety of seeds and fertilizers
- Mixed farming is practiced

Farm activities in the different seasons

- Winter- involves the mending and checking of machinery, farmer's holiday, book keeping and ordering of seeds and fertilizers
- Spring- involves sowing of seeds, spraying and fallow cultivation
- Summer- involves harvesting and fallow cultivation
- Autumn- involves late harvesting and preparing of the fields.(TABLE TO BE DRAWN)

Winter	

Spring	
Summer	
Autumn	

Wheat processing

- After harvesting, the wheat is taken to the elevators by trucks.
- At the country elevators, wheat is cleaned, graded, weighed and stored
- Exported through ports like Churchill, prince Rupert, Vancouver and Montreal, Quebec

Export of Canadian wheat

Mainly to European countries like Britain, Germany, Denmark, etc; Japan, Korea, etc.

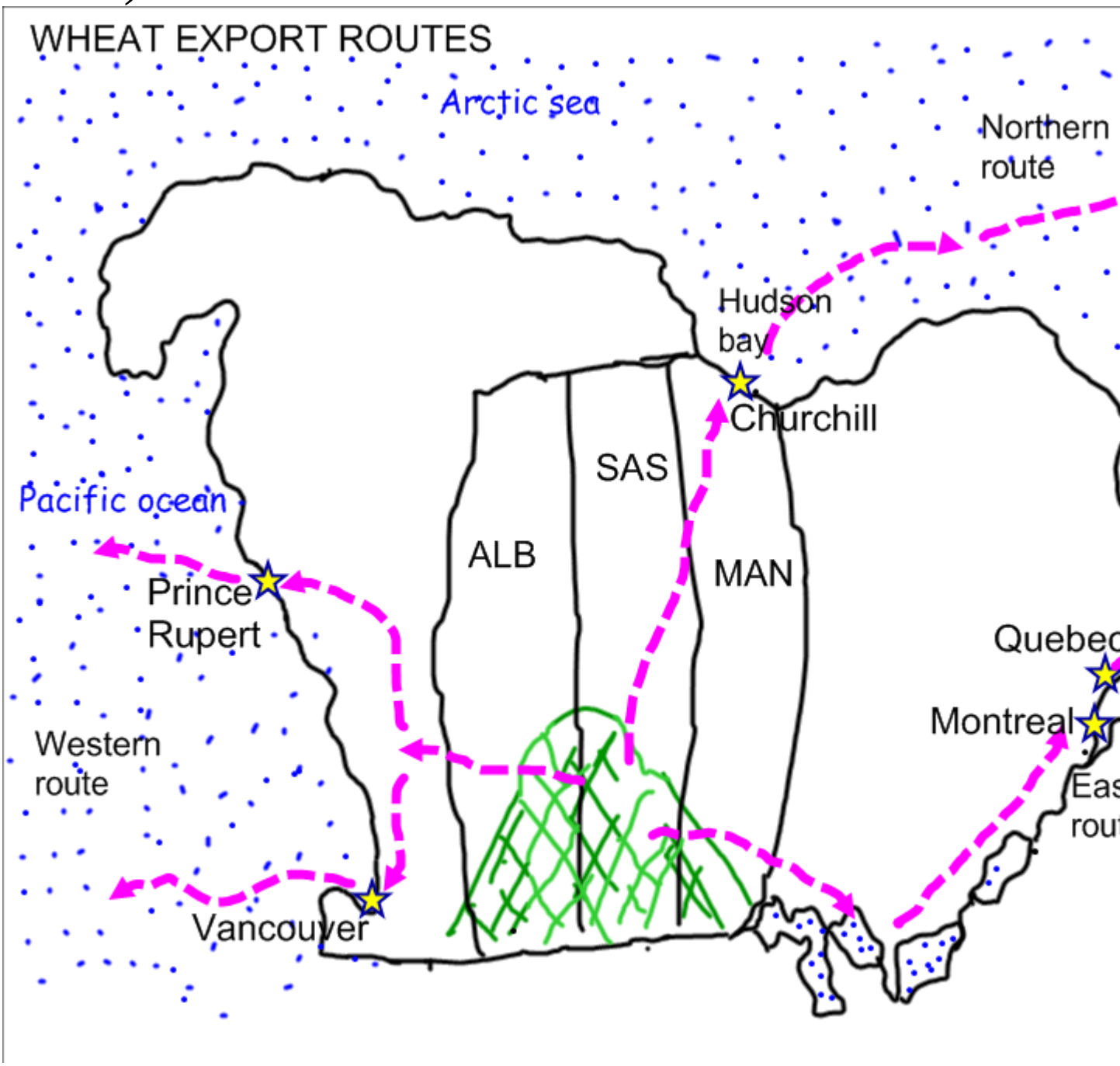
It’s moved using a network of railway linking the many elevators from where the wheat is cleaned, graded, weighed and stored for export. A train with over 100 wagons starts its journey of nearly 800 to 1200km to terminal elevators at the ports for export.

Export routes

There are basically three routes i.e. western, eastern and northern

- x- Prince Rupert- Pacific ocean used during summer to export wheat to Russia
- y- Vancouver- Pacific ocean used during spring and summer to export wheat to Japan, China, India, Korea
- z- Churchill- Hudson bay- Labrador sea- Atlantic ocean used during summer to export wheat to European countries because the Hudson bay freezes in winter
- q- Great lakes- St. Lawrence river- Atlantic ocean used all year round to export wheat to western Europe, southern America and Africa.

(A sketch map showing Canadian wheat export routes)



Suitability of the export routes

- Northern route- it's a short route with a railway network, however it has a short

shipping season of 3 months, congestion and port facilities at Churchill are inadequate

- Western route- its ice-free all year round, has improved port facilities and trans-Canadian railway carrying bulky goods but the railway is long, slow and it's a long distance to the market

- Eastern route- it has cheap water transport, improved port facilities at Montreal and Quebec, easy accessibility to Europe and short distance but it's not ice-free and the water way is relatively long

Other crops grown on the prairies

- Oats, not grown as a cash crop but as animal fodder crop especially for the young stock and it's the 2nd important crop
- Barley, the 3rd valued crop requiring a minimum of 80 days to grow and its tolerant to aridity/desert conditions. About 90% of the Canadian barley is produced at home

- Flax is the 4th valued crop mainly grown in Saskatchewan used as a linseed oil and as a fibre
- Rye, the only commercial crop produced during winter, its tolerant to sandy soils and always grown as a cover crop in the area subjected to severe soil erosion
- Sugar-beet that requires clay loam soils, enough sunshine and a lot of moisture. It's mainly grown in southern Manitoba and in southern Alberta using irrigation. It is used for the extraction of sugar and as an animal feed
- Rape seeds, mustard seed, sun flower, corn, peas, vegetables grown mainly using irrigation water

Problems facing farmers

- Price fluctuation on the world market that discourages farmers.
- Competition from other wheat producers like India, USA, Pakistan, Argentina that limits the market.

- Soil exhaustion due to monoculture leading to poor yields.
- Frost which harms the yielding crops
- Soil erosion which washes away the top fertile soil hence leading to poor yields.
- Over production leading to wastage
- Occurrence of pests and diseases that affects crops hence reducing the quantity and quality.
- Occasional prolonged drought that destroys crops.
- Labor shortage during the harvesting season that delays production.

Solutions

- Mechanization to reduce labour shortage
- Spraying of the crops to kill pests
- Applying fertilizers to improve on fertility
- Diversifying on crops grown in farms to reduce over production and dependence of one crop
- Providing seed varieties that are resistant to pests and severe winter.

- Using a quota system to determine quantity to be produced and sold
- Practicing mixed farming, crop rotation to improve soil management and proper land use
- Storing of the excess crops for the next market

Contribution of Wheat growing to Canada

- Employment opportunities for many farmers and farm managers, wheat exporters, drivers, machine operators.
- Improved standards of living of the farmers due to income from agro-sale
- Provides raw materials for agro-industries hence development of industries.
- Infrastructure development in the farming area e.g. roads, railways that transport wheat to different market centres.
- Foreign exchange is earned by exporting agro-products to Germany, Great Britain, and Japan.
- Food supply to the area at relatively cheaper prices.

- Diversification of the area with agriculture and industry
- Research for high yielding seeds and animal varieties
- Government revenue through taxation and licenses.
- Trade development in the South and other regions
- Improved international relations between Canada and other parts of the world due to the export of the wheat

Industrialization in the Prairies

Though agriculture is very important, today majority of the people live in towns and work in factories. Most of these are agro-industries like food processing, flour mills, dairies, meat packing; engineering works for railway wagons, agro-machinery etc.

As population increased in the Prairies, more industries were set up and distance from major industrial towns favored small ones to develop

like Edmonton, Calgary, Regina and Winnipeg using scrap as raw materials.

Factors favoring Industrialization.

- Abundant raw materials in form of minerals like iron and steel, gold and silver.
- Cheap/abundant skilled labor to work in the industries e.g. machine operators.
- Extensive land upon which to build the industries
- Ready market for the industrial products from the local population and abroad.
- Improved transport and communication networks e.g. roads, railways that ease the transportation of goods, services and the workers.
- Adequate capital to buy industrial inputs
- Positive government policy that encouraged the growth of infant industries by giving them tax holidays, land.
- Prevailing political stability that encouraged the coming of many investors.
- Need to diversify the economy from agriculture to industry.

- Abundant water from river Nelson, Athabasca, which acted as a raw material and a coolant.

Advantages

- A lot of revenue is earned through industrial sales
- Many employment opportunities in the industries as drivers, managers, accountants.
- Improved infrastructure linking markets and industries e.g. roads, hospitals etc.
- Improved standards of living due to income earned by the workers.
- Promotion of urbanization like Calgary, Regina, Edmonton, etc
- Cheap industrial goods for the people
- Skill acquisition in machine operation, packing and loading, administrative skills.
- Improved international trade and relations between Canada and the countries that import her industrial products, countries that sell machinery to Canada.
- Utilizations of natural resources that would have been idol like land, minerals.

Problems faced by the Industries in the Prairies.

- Price fluctuation on the world market that discourages the producers.
- Over production leading to wastes.
- Competition for labor with other sectors like agriculture
- Competition for land with other sectors like mining, agriculture leading to low production.
- Competition for market with other industries that produce similar products that reduces the market potential.
- Poor climatic conditions like winter that puts industrial work at a standstill.
- Inadequate raw materials that limits high output.

Mining industry in canada

Mining has been conducted in Canada since the seventeenth century, but the remarkably rapid development of mineral exploitation dates from

the end of World War I. Petroleum has been found in the mid-west; iron ore deposits in Labrador, Quebec, and Ontario; and uranium in Ontario and Saskatchewan.

Canada is the world's largest exporter of minerals and metals and its mining sector was considered a pillar of the economy and a way of life for Canadians. Canada was the leading producer and exporter of potash (world's largest and richest reserves), the leading supplier of uranium, the second-largest producer of asbestos (possibly the largest deposits) and sulfur (17% of world output and 38% of world trade), the third-largest in titanium, platinum-group metals (PGMs) and mine zinc, fourth in aluminum (from imported oxide), fifth in copper, lead, silver, and gold, and among the leading producers of nickel, salt, and nitrogen in ammonia coupled with petroleum and natural gas.

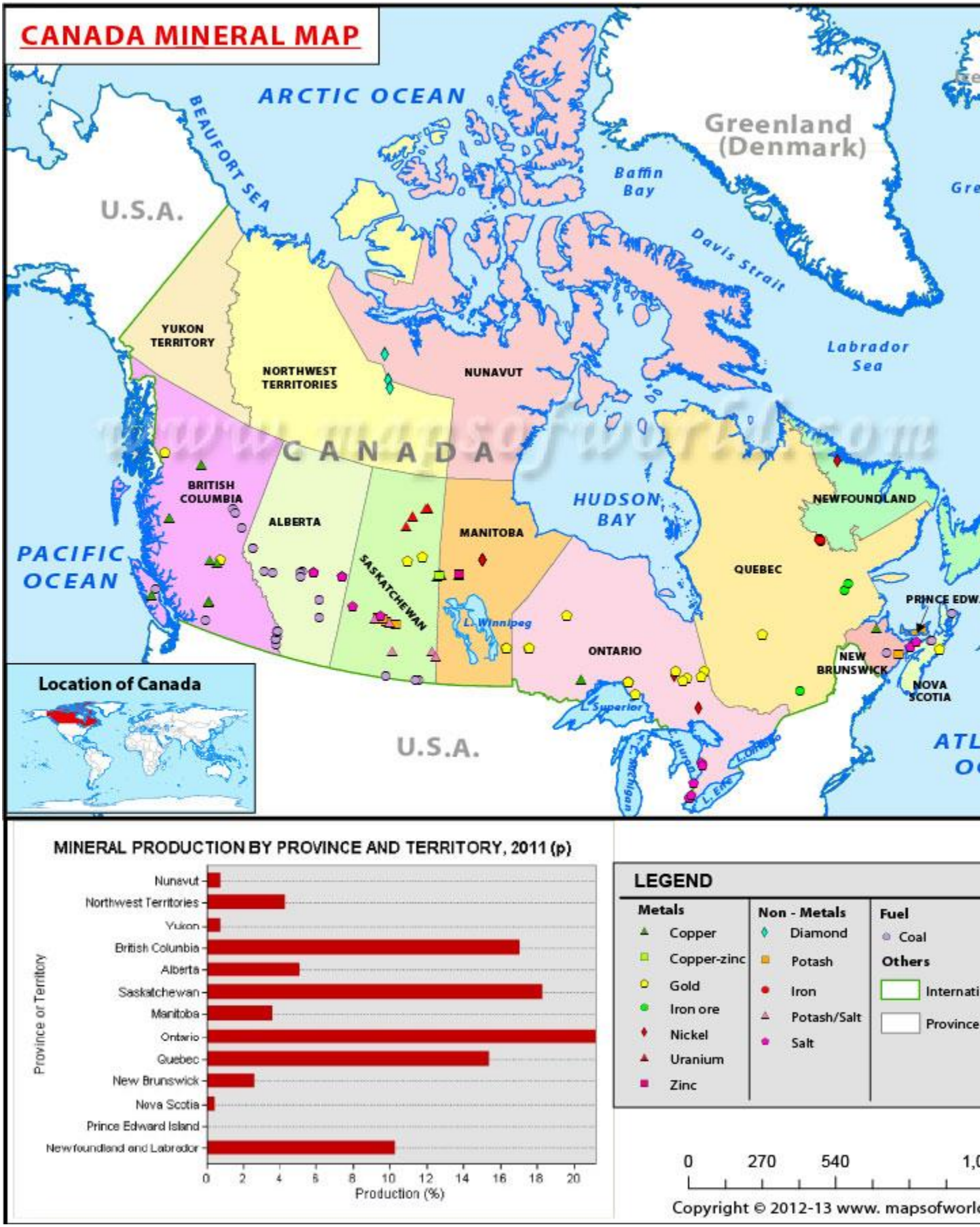
New discoveries have been made such as the huge and rich nickel, copper, and cobalt deposit at Voisey's Bay, and the Ekati diamond mines—

diamond was expected to be the most sought-after mineral in the country.

However, Canada's mineral industry was primarily export oriented, with as much as 90% of some commodities going to external markets.

More than 200 mine sites, including coal sites, were active, and 3,000 mines and quarries produced sand, gravel, and other construction materials as per 2000.

Most of the mineral industry was privately owned; an exception was government participation in potash and petroleum, which were transitioning to private ownership. Mining had the prospect of diversifying and strengthening Canada's economy. Canada was well positioned in terms of its mineral-resource base and its access to markets in the United States.


CANADA MINERAL MAP
ARCTIC OCEAN
BEAUFORT SEA
U.S.A.
Greenland (Denmark)
Baffin Bay
Davis Strait
Labrador Sea
YUKON TERRITORY
NORTHWEST TERRITORIES
NUNAVUT
CANADA
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
HUDSON BAY
NEWFOUNDLAND
QUEBEC
PRINCE EDW
ONTARIO
NEW BRUNSWICK
NOVA SCOTIA
PACIFIC OCEAN
L. Winnipeg
L. Superior
U.S.A.
Location of Canada
MINERAL PRODUCTION BY PROVINCE AND TERRITORY, 2011 (p)
Province or Territory
Nunavut
Northwest Territories
Yukon
British Columbia
Alberta
Saskatchewan
Manitoba
Ontario
Quebec
New Brunswick
Nova Scotia
Prince Edward Island
Newfoundland and Labrador
0 2 4 6 8 10 12 14 16 18 20
Production (%)
LEGEND
Metals
Copper
Copper-zinc
Gold
Iron ore
Nickel
Uranium
Zinc
Non - Metals
Diamond
Potash
Iron
Potash/Salt
Salt
Fuel
Coal
Others
Internati
Province
0 270 540 1,0
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Export countries

Iron ore, potash, and sulfur were exported to the United States, meeting 93% of its potash needs; copper concentrates to Japan; and iron ore and zinc to the European Union.

Exports of mineral commodities and mineral-related products, including fuels, to the United States, etc

Mining Companies

Falconbridge Ltd. operated the Craig, Fraser, Lindsley, and Lockerby nickel-copper-cobalt mines near Sudbury, and the Raglan Mine in northern Quebec;

Nuinsco Resources Inc. in the Lac Rocher area, northeast of Mattagami, Hudson Bay Mining and Smelting Co. Ltd. Mining zinc at Chisel lake in Manitoba,

Quebec Cartier Mining Co. for iron ore; Iron Ore Co. of Canada working at Wabash Mines

coupled with Roche Bay (Northwest Territories), the Peach River area of Alberta, and Ungava Bay and Schefferville (Quebec), Prime Resources Group mining gold at Eskay Creek gold mine, British Columbia.

Minerals and their mining areas.

- Deposits of gold ore were discovered at Hemlo, Ontario, north of Lake Superior,
- Zinc deposit, at Chisel Lake, Manitoba, the Bell Allard zinc-copper mine, Mattagami district, northern Quebec, and the Isle Dieu and Norita East zinc-copper mines, also in Mattagami and in New Brunswick.
- Copper at the Highland Valley Copper and Myra Falls mines, the Mines Gaspé, and the Gibraltar mine, in British Columbia, and at Voisey's Bay
- Iron ore in Wabash Mines, Roche Bay (Northwest Territories), the Peach River area of Alberta, and Ungava Bay and Schefferville (Quebec).

- Silver by Prime Resources Group's Eskay Creek gold mine in British Columbia.
- Lead in New Brunswick. In addition, Canada mined the metals antimony, arsenic trioxide, bismuth, cadmium, magnesium, molybdenum, pyrochlore, selenium, spodumene, tantalite, tellurium, and titanium, Calcium may have been produced as well.
- Diamonds i.e. Canada's first commercial production of diamonds—by BHP Diamonds Inc., in the Ekati Mine
- Potash i.e. the 63%-government-owned Potash Corp. of Saskatchewan Inc. was the largest publicly held potash producer in the world An area extending from central Saskatchewan southeast into Manitoba was probably the largest and richest reserve of potash in the world, and could probably supply all the world's needs for 1,000 years.
- Asbestos i.e. the world's largest deposits of asbestos (including chrysotile, crocidolite, and amosite) were believed to be in a region of eastern Quebec that included Thetford

Mines and the town of Asbestos. The Cassiar asbestos mine, after a six-year suspension, was to be back in production in 2000.

In addition, Canada produced amethyst, anhydrite, barite, brucite, hydraulic cement, clay and clay products, diatomite, dolomite, gypsum, jade, lime, mica (scrap and flake), nepheline syenite, pyrite, pyrophyllite, pyrrhotite, silica (quartz), soapstone, sodium carbonate (soda ash), natural sodium sulfate, and stone (including crushed, building, ornamental, and paving) with capacities to produce graphite and limestone.

Factors/ Conditions

- Rich ore reserves at Hwetseh, Weining, etc
- Adequate/large sums of capital that is used to purchase various mining equipment.
- Improved technology i.e. digging tunnels to reach the mineral.
- Research in exploitation of minerals

- High demand for copper to make bronze, coins, etc
- Accessibility of mining areas by railway and water transport
- Regional policy of self sufficiency
- Large labor force needed in exploitation of different minerals.
- Integration of mining and industrial sectors
- Abundant energy i.e. HEP for copper smelting.
- Positive government policy towards mining

Problems faced

- Some areas have small reserves that make mining very expensive.
- Inaccessibility due to rugged terrain
- Price fluctuation that reduce the expected profits.

- Scattered reserves that makes it hard to exploit the minerals.
- High cost of mining involving the use of machines that affects profits.
- Accidents and other environmental hazards
- Competition from other mineral substitutes e.g. alluminium, steel, wood and plastic.
- Competition from other producers e.g. DRC, Egypt, etc
- Exhaustion of deposits that leads to sudden unemployment.
- Changes in technology i.e. machines used in mining.

Contribution of mining to Canada.

- Abundant and cheap supply of copper in Canada
- A lot of jobs have been acquired e.g. miners, managers, drivers, train captains.

- Proper utilization of the would be waste land/ desert land
- Cheap supply of raw materials for mineral based industries e.g. engineering industry.
- Infrastructure development like roads, railway, in marginal/remote areas to transport the minerals to market and industrial centres.
- Income to miners thus improving their standard of living.
- Improvement of international trade and relations with the countries that import minerals/copper.
- Foreign exchange through export of copper, bronze items to USA and Mexico
- Revenue to government through taxation and licenses that is used to develop other sectors.

THE SOUTH COTTON BELT OF USA

Cotton was the first cash crop grown until the 20th Century; the belt supplied almost ½ of the world's demand for cotton as a raw material. Cotton was first grown in small plots at the coast of Georgia, south and North Carolina, and spread to the west (Louisiana, Texas) and North West up to California.

By 1860, it was the major cash crop over a wide area in USA (Old Cotton belt) mainly in the south east stretching from the Mississippi flood plane to coastal planes bordering the Atlantic Ocean.

Old Cotton Belt

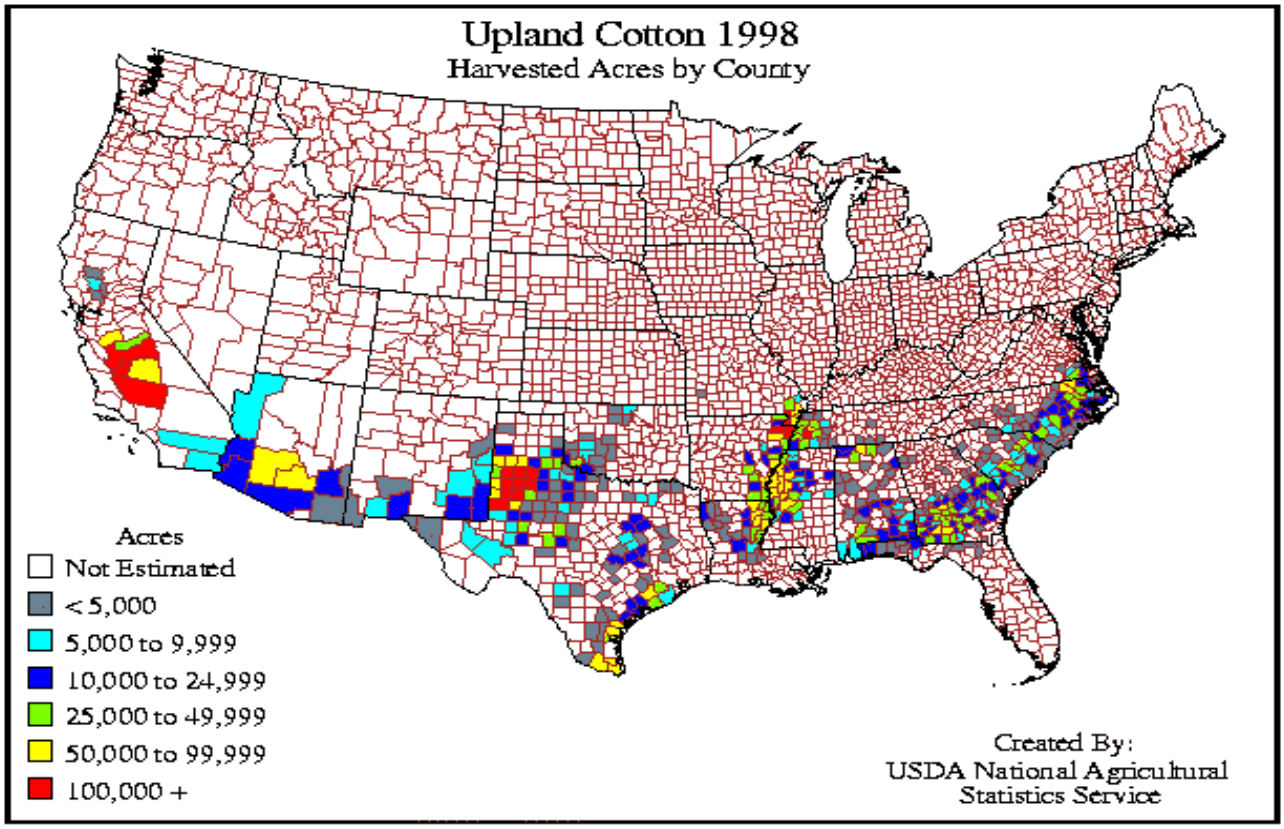
The Old Cotton Belt comprised of the central Mississippi valley, inner coastal plains of Georgia, south and North Carolina, Tennessee valley, black waxy Prairies of Texas, Texas coastal planes and Piedmont region.

Characteristics

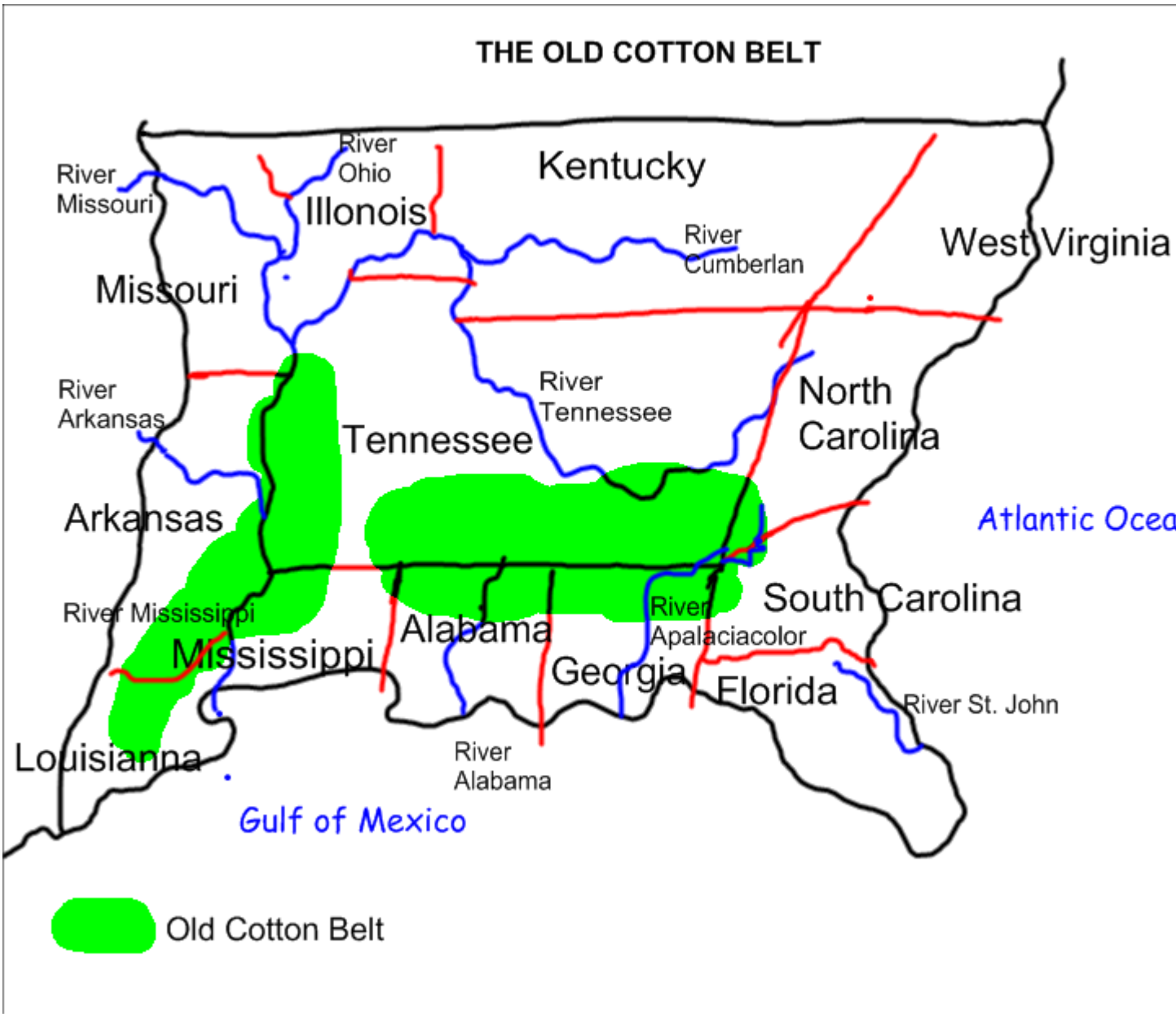
- Large plantations under cultivation

- Cotton grown through monoculture(growing of only cotton/one crop)
- Owned by single families
- Use of slave labor
- Produced one type of crop for plantations like cotton, tobacco, sugar cane
- The South was agricultural and north was urbanized

A sketch map showing the USA Cotton Belt



(A sketch map showing Old Cotton Belt)



Describe the factors\conditions that favored cotton growing\agriculture in the South of USA.

- Fertile alluvial-loam soils deposited in the Mississippi flood plain and black cotton soils in black waxy Texas that helps in the proper growth of cotton

- Low relief/relatively flat land favoring mechanization that ease work.
- Large market for cotton in USA and other countries due to the growing textile industries
- River transport that made it easy for transportation of cotton
- Humid climate which is hot and wet with rainfall of 1300mm and temperatures of 18° C
- 200 days free of frost allowed cotton growing in the region for a long period\thru out the year.
- Vast land to practice extensive farming in the region i.e. where cotton was grown.
- Experience of cotton growing for over 300 years
- Introduction of the cotton gin in 1793 which made cotton harvesting and production easy
- Cheap\ abundant labor of black slaves and poor whites through tenant share holding scheme giving ½ his produce to the land owner

- Expanding market due to improved standards of living of the poor whites and outsiders who desired goods from textiles

Cotton planting and harvesting

- Planted in rows of 1 meter before spring
- Germination in 4- 7 days
- Pruning and rotation with legumes
- Flowers appear yellowish, pink and purple when ready to blossom
- Flowers wither off and the pods form
- Pods dry and split open letting the cotton mass to come out ready for picking

Uses of Cotton

- Making textile
- Seeds are crushed for cooking oil
- Making animal feeds
- Producing cellulose
- Seeds used for making soap

Picking of cotton in the USA Cotton Belt

Spinning and Ginning of cotton

Problems faced

- Severe soil erosion due to monoculture that leads to poor yields.

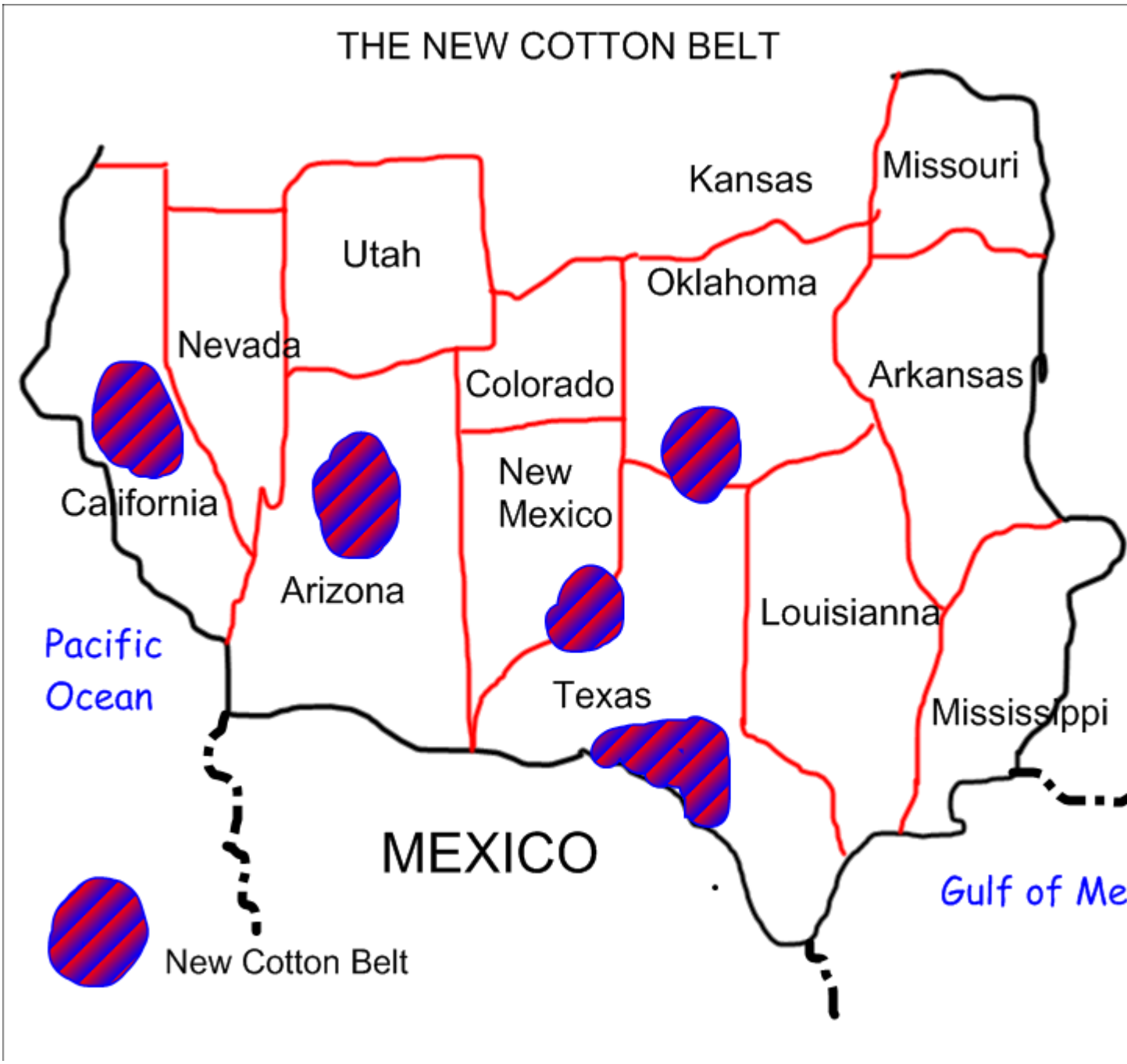
- Poverty and poor standards of living among the farmers due to low payments.
- Soil exhaustion due to extensive farming
- Cotton pest/ boll weevil thriving in warm and humid climate producing poor quality cotton yields.
- Shifting of agricultural workers to industries hence limited labor in the farms.
- Low prices for cotton in the region that discourages cotton farmers.

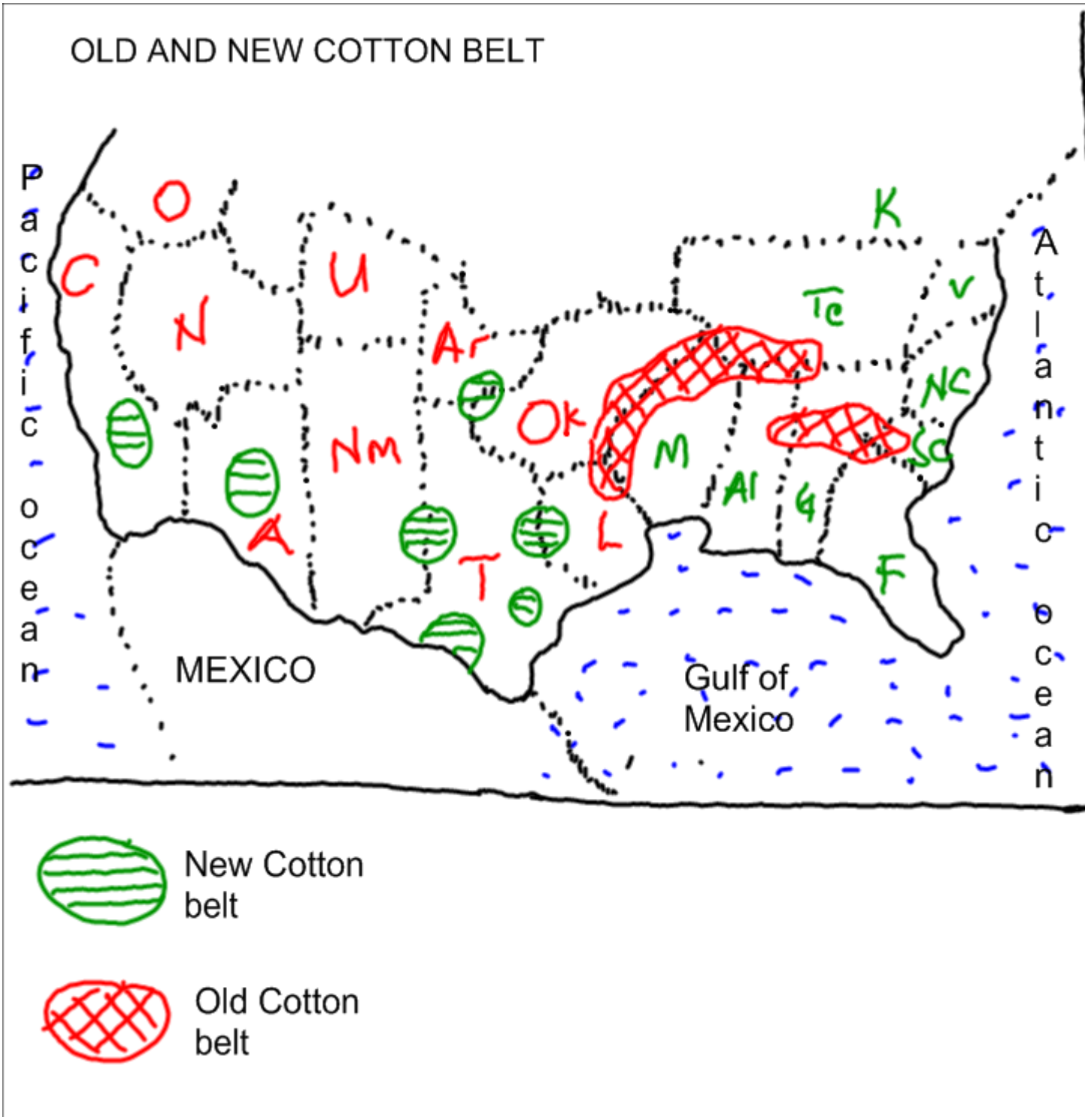
New Cotton Belt

However, now cotton growing has shifted to the New Cotton Belt due to problems faced in the Old Cotton Belt and conducive factors in the new region.

Cotton growing has shifted from the (humid/areas that received reliable rainfall) south east states to the drier western states in the areas of the high planes of Texas, Salt River valley in Arizona, San Joaquin in California and parts of Oklahoma State and New Mexico.

A sketch map showing the New Cotton Belt


THE NEW COTTON BELT
Kansas
Missouri
Utah
Oklahoma
Nevada
Colorado
Arkansas
California
New
Mexico
Arizona
Louisianna
Pacific
Ocean
Texas
Mississippi
MEXICO
Gulf of Me
New Cotton Belt



Characteristics

- Medium sized farms individually owned
- Mechanization replacing slave labor
- Paid labor introduced

- Mixed farming replacing monoculture/one-crop cultivation
- Modern farming methods i.e. use of fertilisers,combined harvesters and conservation of soil
- Irrigation farming from rivers like Mississippi and Rio-grande.

Reasons for shifting

- Flat land in Mississippi and Texas favoring mechanization
- Very rich fertile soils in the lower Mississippi due to constant flooding and deposition by river Rio-Grande
- Cotton pest in the Old Cotton belt i.e. Cotton boll weevil.
- Western areas were generally dry hence favoring irrigation
- American civil war of 1861-65 which destroyed plantations in Georgia and south Carolina
- Humid climatic conditions in the south east favoring boll weevil in the Old Cotton belt.
- Limited labor due to the freeing of the slaves

- Monoculture in the south east led to low soil fertility affecting crop yields.
- Severe soil erosion which affected soil fertility
- Large land in the south west favoring extensive farming
- Advanced agro-technology in planting and processing cotton
- Competition leading to efficiency in production
- Less care for the farms by the farmers in the Old Cotton belt

Factors for the decline of cotton

- Exhaustion of land due to extensive farming
- Soil erosion and loss of fertility due to monoculture.
- Cotton boll weevils in south east areas
- Low prices for cotton which discouraged farmers.

- Agricultural workers looked for jobs in industries
- Occurrence of natural hazards like hurricanes destroying cotton
- Fragmentation\division of land that limited mechanization
- Some cotton fields were reversed into pasture land
- New crops were introduced like maize, sugar cane, tobacco, soya, peanuts, limiting land for cotton growing
- Move by the government to compensate farmers for using their land

Other changes that took place on the cotton belt

- Animal husbandry alongside crop cultivation

- New pastures planted from Asia like Kudzu and Lespedeza covering the eroded bare ground
- Soya bean growing for making cooking oil, animal feeds and margarine in the Mississippi valley
- Dairy and beef production in Texas and Louisiana
- Poultry farming
- Tobacco growing
- Afforestation in the eroded and deforested areas
- Mining of iron ore in Alabama
- Industrialization in Houston
- Soil bank policy to improve land conservation (this was aimed at reducing land for agriculture so as to reduce on the surpluses/wastes)
- Petroleum drilling in New Orleans and south Texas

- Hydro-power production in the area that was used in the industries.
- Growing of rice and ground nuts in Arkansas, Louisiana and Texas

Contribution

- Employment opportunities to the farmers
- Improved standards of living of the farmers due to income from agro-sale
- Provided raw materials for agro-industries like diary products.
- Infrastructure development in the farming areas e.g. roads, hospitals.
- Foreign exchange is earned by exporting agro-products like margarine, cooking oil
- Domestic items and food supply to the area e.g. rice, cooking oil, milk, margarine etc.

- Diversification of the area with agriculture and industry
- Research for high yielding seeds and animal varieties
- Government revenue through taxation and licenses.
- Trade development in the South and other regions
- International relations between USA and other parts of the world

Problems facing the Agricultural sector

- Soil exhaustion in the area due to extensive farming
- Shortage of labor as agriculture is very demanding
- Pests and diseases that affect the crops and output

- Pollution through the extensive use of fertilizers
- Rapid weed growth competing with commercial crops for nutrients hence low yields.
- Occasional drought in the region leading to crop failure
- Price fluctuation on the world market due to perishability affecting profits
- Shortage of rainfall especially in the far west
- Population pressure limiting agricultural land
- Land fragmentation affecting agricultural mechanization

Solutions

- Proper use of fertilizers and manure
- Continued mechanization to ease work

- Spraying and use of herbicides to kill pests and diseases
- Crop rotation to improve soil conservation
- Government giving subsidies (financial help)/ incentives
- Promoting irrigation in areas with less rainfall
- Employment of migrant labor
- Land consolidation to enhance mechanization

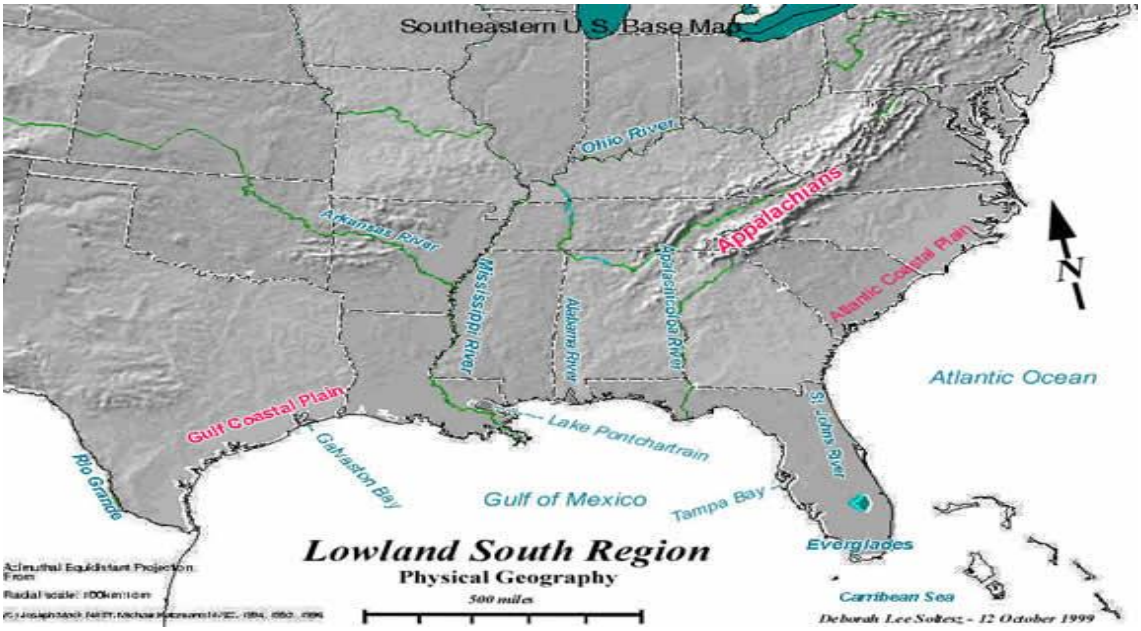
Industrialization in the South

Beside commercial agriculture mainly of cotton growing in the South, industrialization became a major activity following the discovery of minerals, advanced technology and agricultural development.

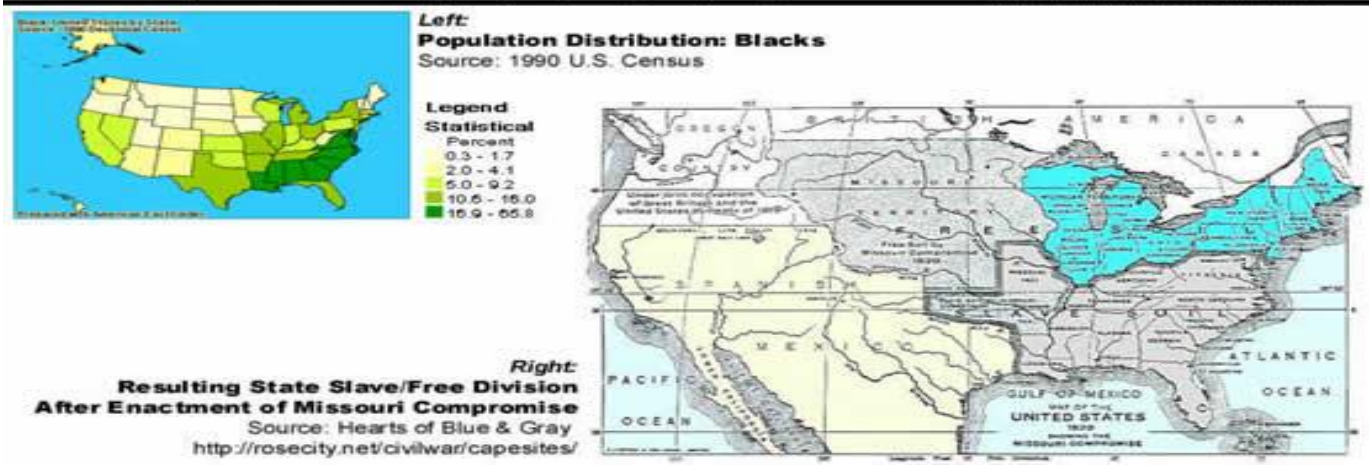
Major Industrial towns

- Houston with oil refineries, engineering, ship building, electronics, iron and steel, petro-chemical, etc
- New Orleans with petroleum refining, food processing, textile, ship building, sugar refineries, metal fabrications, etc
- Birmingham with air craft equipment, food processing, automobile, paper and pulp, chemical, metal fabrication, etc
- Atlanta with motor vehicle manufacture, air craft, rolling stock, textile, chemical, and home of Coca cola/beverage
- Charlotte being the major textile producing area in Piedmont zone

A sketch map of the South showing relief and drainage



A sketch map showing Industrial towns and mining areas



Factors for development of industries in the South.

- **Abundant** raw materials like coal, rice, fruits that are needed in the industries.

- **Various** power sources like oil and natural gas at Houston, New Orleans and nuclear energy to run the machines and lighting up
- **Improved** transport and communication networks e.g. railway, roads and water transport.
- **Positive** government policy of tax concessions/ exemptions, cheap industrial sites, etc
- Availability of **adequate/large sums** capital to buy industrial inputs
- **Conducive/suitable** climatic conditions of Sub- Tropical climate with warm sunny summers that ensured the smooth running of activities thru out the year.
- **Cheap** labor with a positive attitude i.e. skilled and semi skilled.

- **Proximity/nearness** to the international market via the Gulf of Mexico
- **Large** market potential in the area and from other countries like Japan.
- **Abundant** water supply from the various rivers like Ohio, Arkansas, and Mississippi used as raw material and coolant.

Importance

- **Employment opportunities** created e.g. **managers, marketeers**, drivers and cleaners.
- Outward migration from the South reduced due to the jobs that were created.
- **Economic co-operation** between the North and South was improved
- **Foreign exchange** was earned through **export** of finished industrial

products to Japan which foreign exchange was used to develop other sectors.

- **Improved standards of living** of the industrial workers due to **income earning**
- **Infrastructure development** linking industrial towns to market centers e.g. schools and roads, hospitals.
- More **urban development** in the South like **Dallas, San Antonio**, Tampa, etc
- **Dense population** in the area increasing market potential for industrial finished goods.
- Government **revenue** through **taxation** and **licensing** the industrial investor
- Improving of international trade relations between USA and other countries through trade

- Natural resource utilization for the good of the people

Problems facing Industrial development

- Congestion due to over concentration of industries
- Environmental pollution limiting clean raw materials
- Competition from other industrial regions within USA, Canada and the outside world
- Exhaustion of natural resources/ raw materials
- Limited room for expansion due to increasing need for land by other economic activities
- High cost of production especially for the heavy industries like iron and steel
- High taxation by the government affecting projected profit

Solutions

- Expansion to other industrial parks and towns
- Enacting laws against pollution
- Market research to expand sales
- Advertising the industrial products produced in the region
- Importation of raw materials from other countries
- Tax holidays and subsidization/incentives

BRITISH COLUMBIA

It is the west province of Canada located at approximately 48º00'N, 60°00'N and 114°04.1'W, 139°03'W.

It borders the Pacific Ocean in the west, Alaska-USA in the northwest, Yukon territory and Northwest territories in the north, Alberta in the east and

Washington, Idaho and Montana in the south.

Its size is approximately 944,735 km^2 with 925,186 km^2 as land and 19,549 km^2 as water having a population of around 3.9 million with a density of 29/km^2; this suggests that the state is sparsely populated.

Relief

Mainly high mountains with rugged terrain/landscape having rocky mountains in the southeast bordering Alberta, plateaux in the central and coastal low lands in the west bordering Pacific ocean, Stikine in the northwest thus 75% of British Columbia is mountain landscape. Because of being

rugged and forested it is sparsely populated yet with a potential for agriculture.

The plateau area is the lowest region that lies between the coastal ranges and Rocky Mountains in the province.

Relief is subdivided into four regions;

- West coast mountain system consisting of coast mountain range and Insular mountains forming Vancouver and Queen Charlotte islands

- East mountain system consisting of the Rockies and Columbia mountain ranges
- Great interior plains referred to as ‘Peace river country’ in the north east corner
- Rolling grasslands and forests of the interior and Stikine plateaux

Spectacular mountain terrain

Drainage

- Various rivers like Stikine/stincine, Skeena, Nass, Fraser, Columbia, Peace, Liard, etc and lakes like Williston, Kinbasket, Atlin, etc.

Climate

Experiences semi-arid cool temperate continental climate in the interior valleys of the south due to the shadow effect of the rockies.

It is basically cool with heavy rainfall due to moist wind from

the ocean increasing over the Rockies.
This forms relief rainfall due to condensing enabling forest growth.
Montanne climate is experienced in the Rockies.

A sketch map of British Columbia showing drainage, relief, etc

Exploitation of Natural resources

Natural resource is a gift of nature that can be utilized by man to meet his basic needs.

Like lakes, rivers, minerals, trees, etc.

Forest Exploitation/ Forestry

Forestry refers to the science of planting, maintaining and exploiting trees.

Lumbering is the cutting down of trees to process out timber products and it's a major activity practiced throughout the year.

British Columbia's economy largely depends on export of wood products through port Alber on the Vancouver Island

to USA, Japan, United Kingdom, European Economic Community, etc. Nearly 96% of the forested land is coniferous.

Tree species

Forests are mainly coniferous or temperate producing soft wood unlike Tropical forests. The major tree species include

- soft wood like western Hemlock, Sitka spruce, Douglas fir, western larch, sub-alpine, lodge pole pine, amabilis fir, red cedar,

balsam fir, white pine, yellow Cyprus and ponderosa pine.

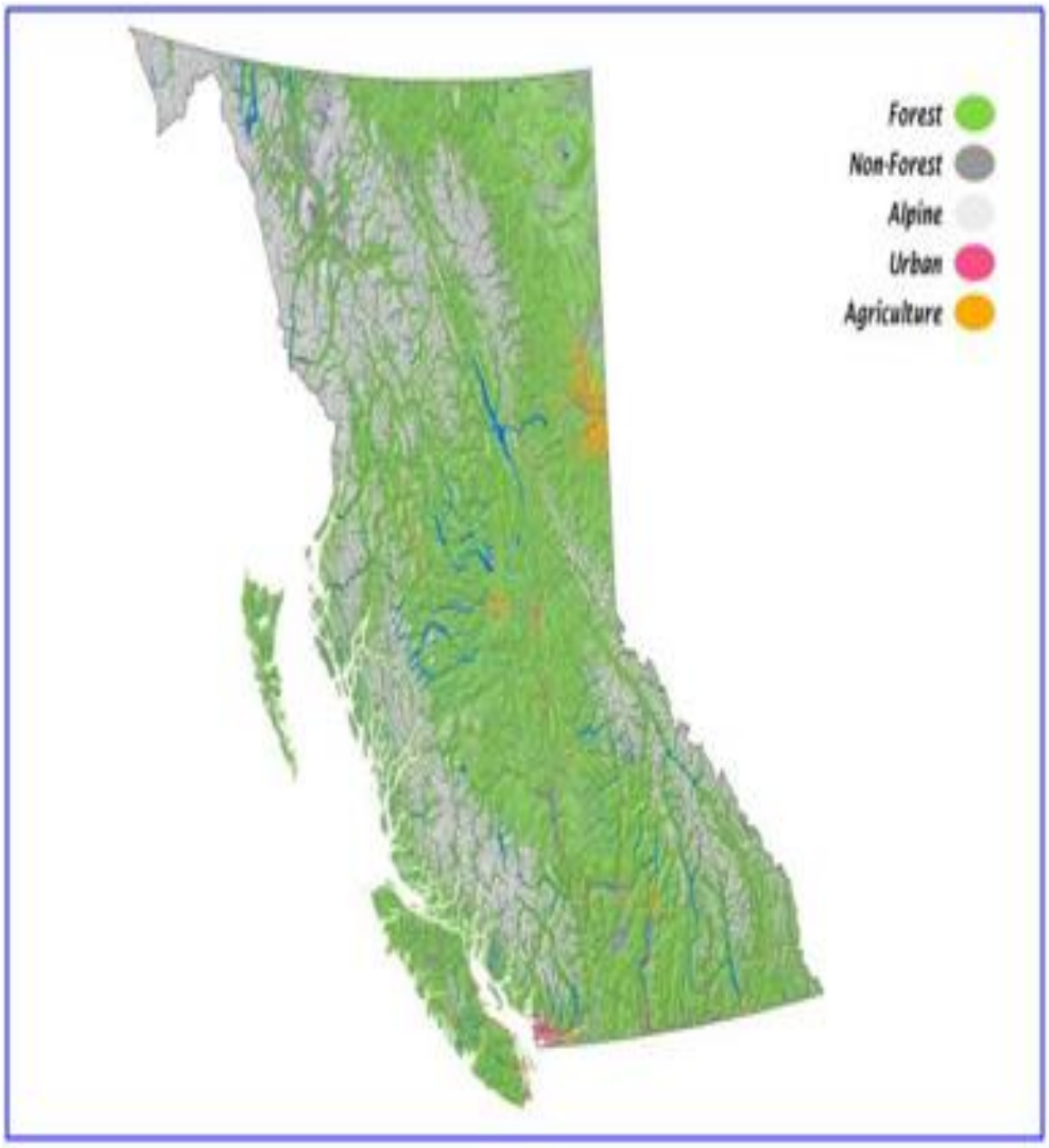
- Hard wood like white birch, red Alder, big leaf Maple, trembling Aspen, pacific dogwood, mountain alder and western yew,etc.

Characteristics

- Ever green
- Pure stand/ one specie
- Tall, straight and slender
- Small and needle shaped leaves
- Fairly apart forming a moderate density

- Cylindrical shaped leaves
- Soft wood
- Small branches

A sketch map of British Columbia showing forested areas



Land use in British Columbia

Land use	Percentage
Cultivated	01

land	
Agricultural forests	39
Rocky mountains	56
Other land	04
Total	100

Factors favoring Forest exploitation in British Columbia.

- Conducive climate with reliable rainfall and evenly distributed that favors the proper growth of trees.

- Valuable tree species which mature quickly
- Availability of wide\ready market in British Columbia and Mexico, etc
- Georgia strait and fiords for coastal water ways that transport the logs to the saw mills
- Adequate Capital which has been invested by the government.
- Postive government policy which enforced laws and invited investors
- Sparse population in the area

- Physical rugged set up of landscape favoring mainly forestry
- Growing industries that need raw materials as timber
- Afforestation program that promoted forest conservation
- Public awareness of the importance of forests to man
- Advanced technology to monitor forests and process timber e.g. using power driven saws, fire detectors

Importance

- Employment opportunities like the firemen, lumber jacks, etc
- Increased technology in forestry i.e the use of power driven saws
- Foreign exchange is earned through exporting wood products to Mexico.
- Diversification of the economy with industries and fishing
- International relations between British Columbia and other countries has

improved due to trade in wood products.

- Cheap forest products for the people
- Improved infrastructure in forested areas, saw mills, paper and pulp industries, etc
- Formation of convectional rainfall through evapo-transpiration
- Provision of medical herbs to the natives
- Habitat for wild life promoting conservation

- Tourism due to abundant fauna(animals) and flora(vegetation)
- Trees act as wind breakers
- Trees help fertilize soil by decomposition of leaves, tree branches, etc
- Water catchment areas/ water shed giving rise to rivers
- Promoting industrialization by acting as raw materials
- Provide wild fruits and other foods
- Avenues for research/ education study in botany, pharmacology, etc

- Areas for leisure and entertainment
- Modify climate through evapo-transpiration
- Purify the environment through gaseous exchange
- Harbor wild animals, pests, etc

Problems facing Forestry

- Fire outbreak causing loses
- Over exploitation of valuable timber
- Rugged terrain/landscape causing difficulty in transportation
- Illegal cutting of trees which causes losses.
- Encroachment by the people causing loses

- Limited capital to buy good tools, to use in the industry.
- High transport costs because the logs are heavy, and yet the terrain is so rugged and it is very hard to construct roads.
- Unfavorable climatic conditions like severe winter which hinders transportation.
- Competition from other forested countries like Gabon, Swaziland
- Limited land for expansion due to increasing population and industrial development
- Extinction of valuable timber which takes long to mature hence delays the process.

Luxuriant Coniferous forests of British Columbia

Fishing- water resources of British Columbia

This is carried out in the Pacific ocean and inland lakes and rivers with variety of fish like salmon, mackerel, whale, Pollack, tuna, herring, sardines, etc.

The inland rivers include Columbia, Fraser, Stincine/ Skeena, Peace and lakes like Williston.

- **F**

Factors that led to the development of Fishing in British Columbia

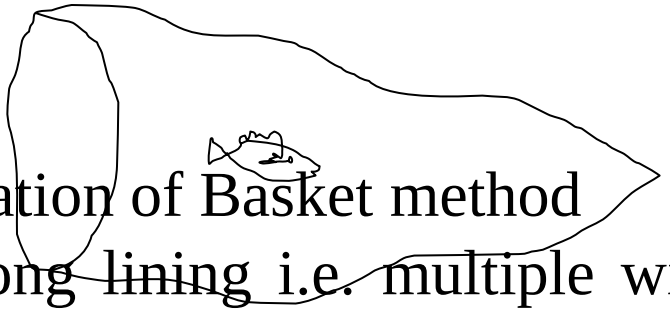
- Presence of abundant planktons that are food for fish.
- Shallow continental shelf for shoreline fishing
- Relatively warm temperatures for easy fish metabolism and breeding
- Highly oxygenated water for fish growth and survival
- Clear water enabling the penetrating sun’s rays
- Alkaline water suitable for plankton growth
- Commercial fish species like salmon and tuna that are highly demanded on the international and national level.
- Large market for fish and its products within British Columbia and else where.

- Advanced technology with better fishing methods like trawling, purse seining, etc
- Positive government policy to enhance fishing thru giving tax holidays.
- Availability of adequate capital to buy fishing gear
- Abundant guano (bird waste) fertilizing water for plankton growth
- Cheap skilled labor to go fishing and process fish
- Developed transport and communication networks linking fishing grounds to markets
- Modern preservation methods like freezing and canning/tinning that have favored sales
- Long experience of fishing thereby having skills

- Abundant timber for making fishing ships/ boats
- Coastal areas are ice-free during winter hence all-year round fishing
- Presence of off-shore islands like Vancouver and Queen Charlotte for fish breeding

Fishing methods

- Baskets that are cone shaped in nature for the shallow water

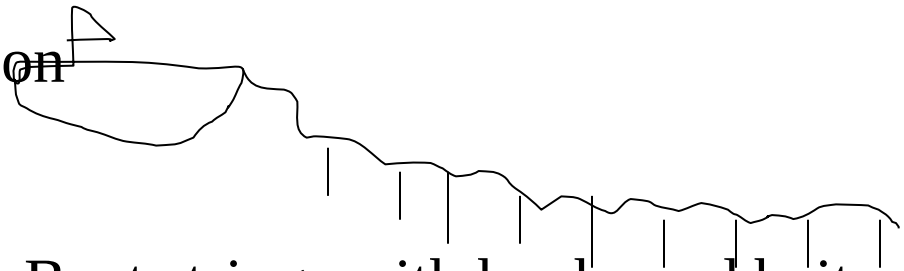


Fish

Illustration of Basket method

- Long lining i.e. multiple with many hooks or a hand hook

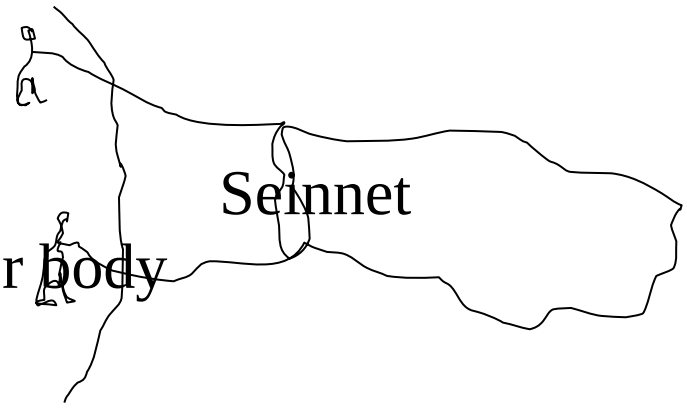
Illustration



Boat strings with hooks and baits.

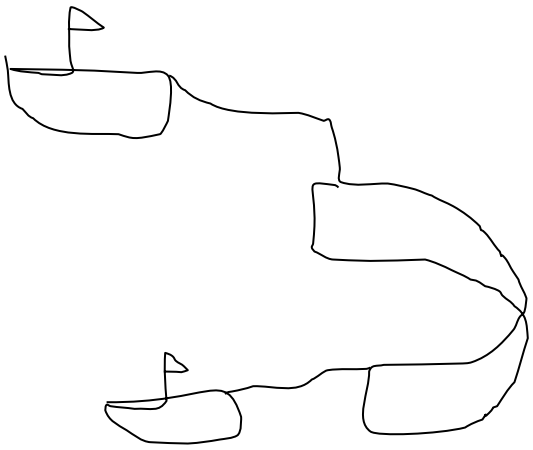
- Beach seining where the nets are operated from the coast by ropes

Illustration



- Purse seining/tycooning where two boats are used fastened on nets with floaters on top and weights at the bottom in a circular form shape

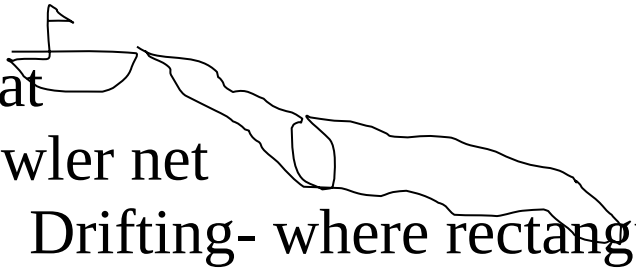
Illustration seinboat



cicular net,waterbody,canoe.

- Trawling using a cone-shaped net kept open by boards and dragged along the ocean floor by a trawler boat

Illustration

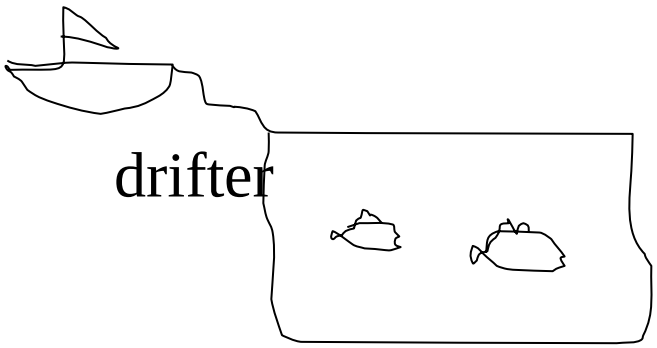


boat

trawler net

Drifting- where rectangular gill nets are used fastened on a drifter boat catching fish by trapping their gills

Illustration



drifter

rectangular net

fish

Preservation methods

- Smoking where fish is put on a mesh-net platform and fire lit underneath it emitting heat that dries the fish
- Salting where fresh fish is sliced and salted and later placed in the sun to dry
- Tin-canning where fish is cooked and packed awaiting export
- Refrigeration where fresh fish is put in fridges or ice-cabins for a given period of time
- Factory drying where fish is dried mechanically in factory stalls which are wire messed and fire is lit underneath

Importance

- Raw materials for the agro-industries
- Foreign exchange through the export of fish to countries like USA.Mexico.

- Employment of the fishermen, transporters and processors in the fishing industry.
- Economic diversification from mining and forestry to fishing leading to development
- Production of products like proteins, drugs, fertilizers, animal feeds, cosmetics used by the local people and international markets.
- Increased technology in fishing for better quality fish e.g use of trawl boats for fishing.
- Development of infrastructure linking fishing grounds to markets like roads, railways.
- Industrialization for producing fishing gears and processing of fish.
- Revenue to the government through taxation and licensing of the fishing industries and activities.

- Study and research concerning marine life
- Fish eat mosquito larva reducing prevalence of malaria
- Improvement of International trade and relations between British Columbia and other countries

Problems faced

- Over fishing especially of salmon fish in the rivers that leads to extinction hence low catch.
- Competition for market from other fishing countries like Japan, Norway, Peru that lowers the projected profits.
- Winter season in the interior limiting inland fishing
- Water pollution from industrial wastes which contaminate breeding grounds hence making the fish caught unfit for consumption.

- High costs of transporting fish products to overseas market centers that reduce profits.
- Indiscriminate fishing leading to loss of young fish
- Sinking of fishing ships causing loses and death of fishermen.
- Poor traditional fishing methods that limit quantity of fish caught e.g. basket method
- Price fluctuation on the world market due to perishability
- Poor sanitation of some fishing grounds limiting market
- Labor shortage affecting quantity harvested and processed
- Limited home market as many people carry out fishing
- International restrictions especially in the Pacific Ocean that limits the quantity of fish caught.

- Interference in British Columbia waters by foreign vessels especially Japan.

Solutions

- Setting strict laws on fishing methods and over fishing
- Increased quality of fish products to ensure market
- Treating of wastes before discharge to avoid pollution
- Loans to the fishermen to access better fishing gear
- Improving hygiene in the fishing grounds
- Training of manpower with better fishing and processing skills
- Improvement in transportation to expand market
- Introduction of fish farming to supplement the natural source of fish
- Maintain International relations for expanded markets.

- Economic diversification to reduce on over fishing and price fluctuations.
- Exportation of fish to other states to widen market for fish.
- Use of International agreements and bodies e.g. North West Atlantic Fisheries Organization (NAFO) Consisting of 17 countries to solve conflicts over territorial waters.
- Research to improve fishing and acquire market.

SAMPLE QUESTIONS:

1. Draw a sketch map of British Columbia and on it mark and name:

I. The Pacific Ocean,

ii.Rivers Nechako, Fraser

iii.Lakes Williston and Kinbasket

iv.Fish processing ports: Vancouver, Kitmat and Victoria.

(b) (i) State any two commercial deep sea fishing methods used in British

Columbia.

(ii) Describe how the following methods stated in (b) (i) above are used.

(c)Explain the conditions which have led to the development of the fishing industry in British Columbia

(d)Outline the benefits of the fishing industry to the People of British Columbia

Agriculture

Nearly 1 % of land coverage is used for crop cultivation while other lands available for agricultural activities is 4 %

Types

- Arable farming especially growing of fruits like plums, apples, peaches, etc on fertile valley soils in the Okanagan valley
- Dairy and ranching for beef cattle and sheep in the dry interior plateau and sheltered valleys

- Mixed farming near towns in the better watered and fertile valleys coupled with coastal lowlands like Vancouver

Why not well developed

- Very mountainous landscape that hinders mechanization.
- Glaciation and cool temperatures limiting crop growth
- Insufficient rainfall in the interior plateau leading to irrigation
- Soils are generally infertile since they are even thin.
- Low population and low market demand for agro-products since they very much rely on imported food and fish.
- Land is heavily forested limiting cultivable land
- Poor transport and communication networks due to the mountaneous nature, cutting off some remote areas.
- Frequent frost preventing maturing of crops and bearing fruits

- Most people are employed in fishing, lumbering and mining

Mining

British Columbia is endowed with a variety of minerals such as copper, bauxite, zinc, gold, silver, lead, oil, etc.

Factors

- Large capital by settlers during the period of the 'gold rush'
- Efficient transport e.g. the Canadian – pacific railway, great northern railway/road, British Columbia railway
- Advanced technology in mining and processing
- Intensive research into use of rare minerals e.g. tungsten and molybdenum in electricity and steel industries
- Large market for minerals within and outside

- Skilled and semi-skilled labor in mineral mining and processing
- Power sources for processing minerals
- Large deposits of minerals of commercial value
- Variety of minerals for diversification
- Large quantities of fresh water for processing minerals
- Occurrence of some minerals near the earth's surface
- Proximity to the coast for easy exploitation and exportation
- Political stability attracting investment and exploitation

Contribution

- Employment of the natives e.g
- Income to the natives improving their standards of living
- Industrialization in the area due to mineral raw materials e.g. tungsten in the steel industry.

- Use of oil and natural gas as fuel
- Diversification of the economy reducing dependence on forestry and fishing
- Infrastructure development e.g. roads, railway, etc
- Urbanization and related advantages e.g. Vancouver.
- International trade and relations with other countries
- Revenue to the government through taxation, licensing and exportation
- Avenues for academic research and study

Problems

- Rugged terrain making accessibility difficult
- Harsh winter conditions limiting mining
- Exhaustion of some minerals leading to disserting of old towns
- High costs of mining for deep minerals

- High transport costs from to coastal towns
- Accidents in the mines
- Floods in the mines
- Price fluctuation on the world market
- Competition from other countries and substitutes
- Shortage of skilled labor due to the risks involved
- Pollution of the environment affecting miners and surrounding communities

Urbanization

Vancouver Port

It's the leading port in British Columbia and 3rd largest in Canada after Prince Rupert in the west and Churchill in the north dating back in the 1950's.

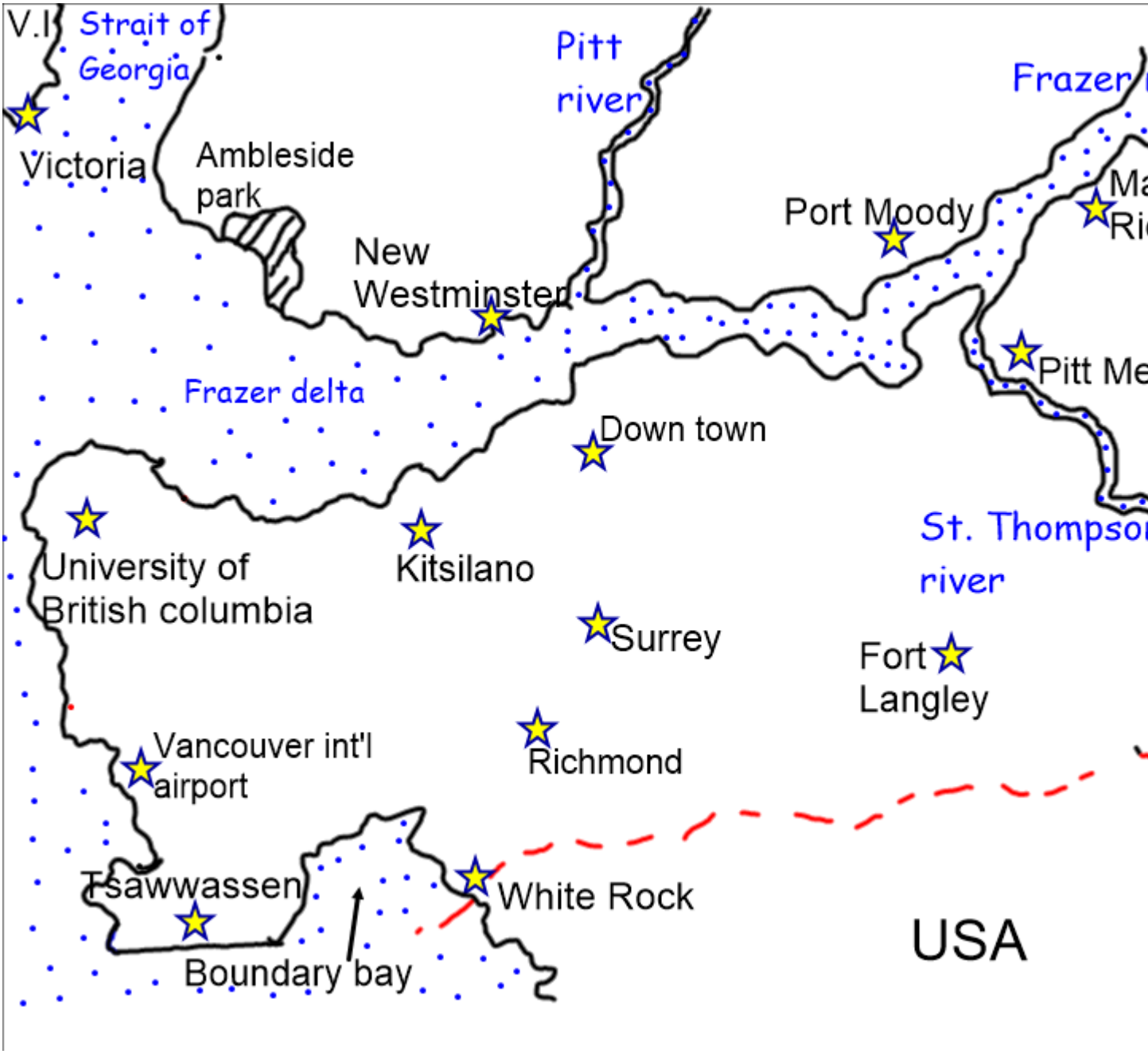
Factors

- Deep waters favoring sailing of ships

- Natural harbor for easy landing, loading and off-loading of goods.
- Well sheltered harbor against strong winds and waves
- Development of fishing in the region acting as an export port
- Dense temperate forests nearby favoring ship building industries
- Abundant power for domestic and industrial use
- Improved transport and communication networks like road and railway
- Increasing industrialization like metal smelting, fish canning, saw mills, oil refineries, etc
- Flat land of the Fraser delta and Fraser valley linking to the interior
- Opening of the Panama canal in 1914 for exporting timber and grain

Problems faced

- It’s far from major consumer and market centers like Europe
- Congestion due to large quantities of goods transported
- Poor visibility due to fog
- Poorly connected to the hinterland due to diverse drainage
- Limited land for expansion due to being on delta land
- High crime rate arising from dense population and unemployment
- High government expenditure in providing the necessary social services


V.I
Strait of Georgia
Victoria
Ambleside park
Pitt river
Frazer
Port Moody
New Westminster
Frazer delta
Down town
University of British columbia
Kitsilano
St. Thompson river
Surrey
Fort Langley
Vancouver int'l airport
Richmond
Tsawwassen
White Rock
Boundary bay
USA

CALIFORNIA

Found on the western side of USA and the 3rd largest after Alaska and Texas.

Relief

- Coastal ranges broken by the **golden gate** and San Francisco harbor where the Sacramento and San Joaquin rivers flow to the ocean with longitudinal valleys like Santa Claire and Saline's found south of the golden gate behind Los Angeles.
  San Gabriel and San Bernardino strike inland in

southeastern direction leaving a low land behind Los Angeles.

- Central valley closed by Mt. Shasta in the north and Tehachapi Mts in the south. It is drained by Sacramento and San Joaquin carrying alluvial in the valley.
- Sierra Nevada ranges which is a massive flow of volcanic, metamorphic and sedimentary rocks. It's deeply dissected by rivers on the western side like river Kern, Owens, Colorado, etc.

Many features of glaciation can be seen like U-shaped valleys, grooves, etc.

- South of California consists of deserts with parts below sea level like Mohave and Colorado deserts.

Climate

It’s a Mediterranean type with temperatures differing between the north and south of the Central valley or between Coastal hills or smaller elevation at roots of Sierra.

Along the coast, minimum temperatures rise and rainfall reduces with a fair regularity from north to south.

Mountain barriers of the coast block rain bearing winds and moraine influence at the Pacific from the interior basins and ranges region.

During the summer period (april- sept) rainfall is received along the coast and valley. The summer months are rainless in the interior; storms that occur are often caused by extreme

convectional turbulence and violent winds in evening.

However, lakes appear and disappear with amazing speed and in winter (December to February) due to continental cooling causing the temperatures reduce leading to arid aspect and scanty precipitation and desert-like vegetation.

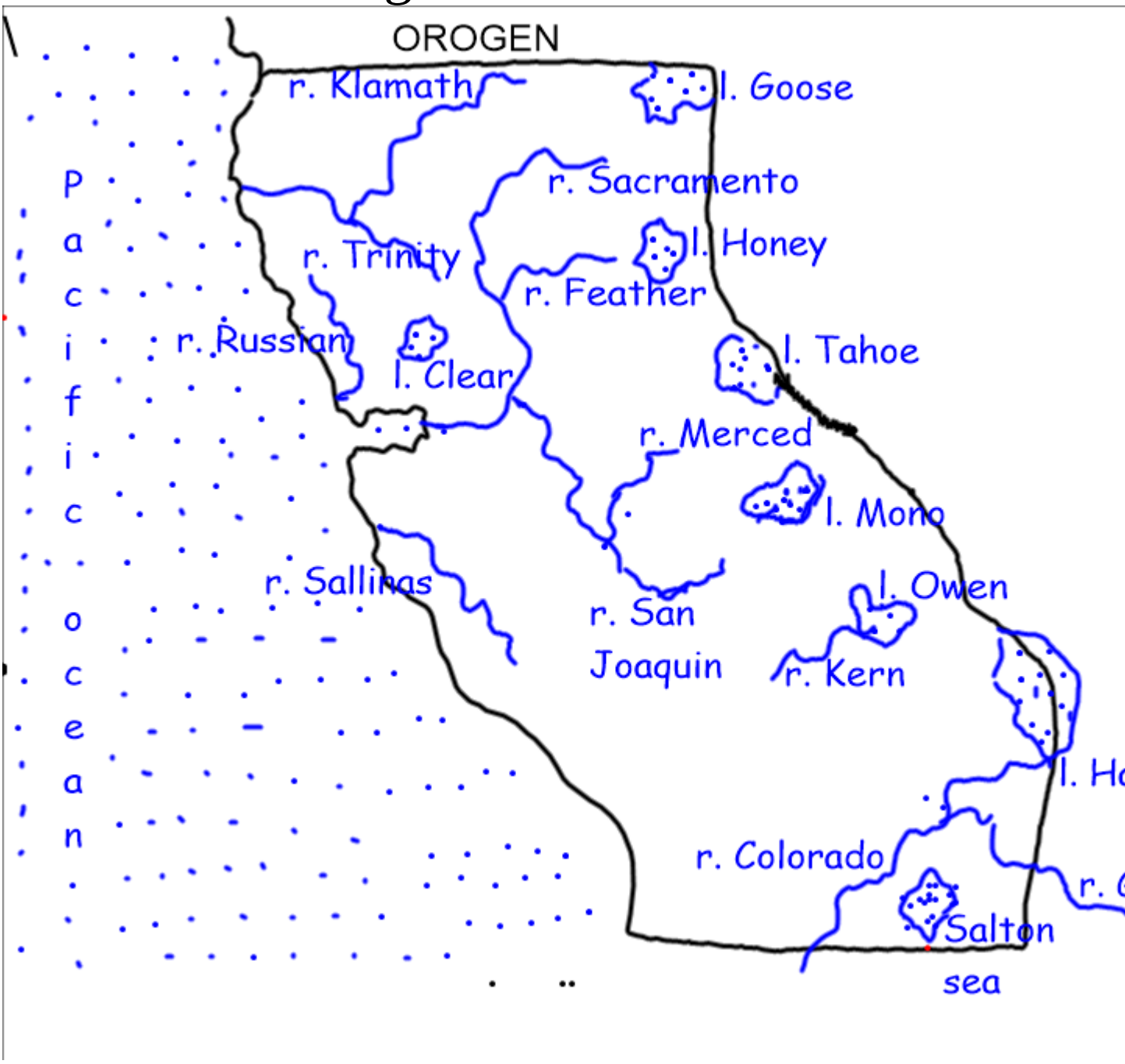
Soil

Have thin and infertile soils in the coastal ranges and the Sierra Nevada; though fertile alluvial soils exist in the Central valley due to stream deposition.

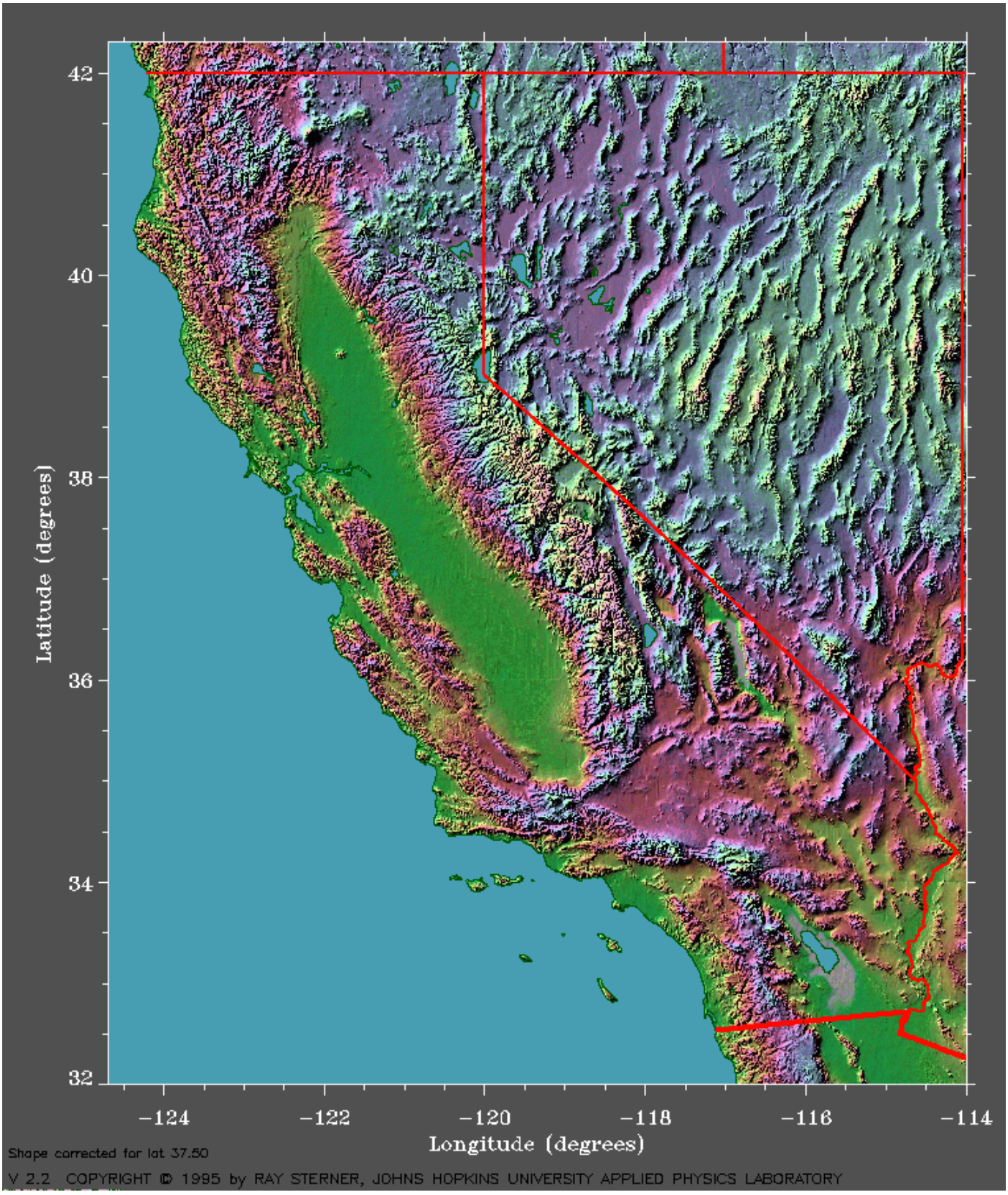
Drainage

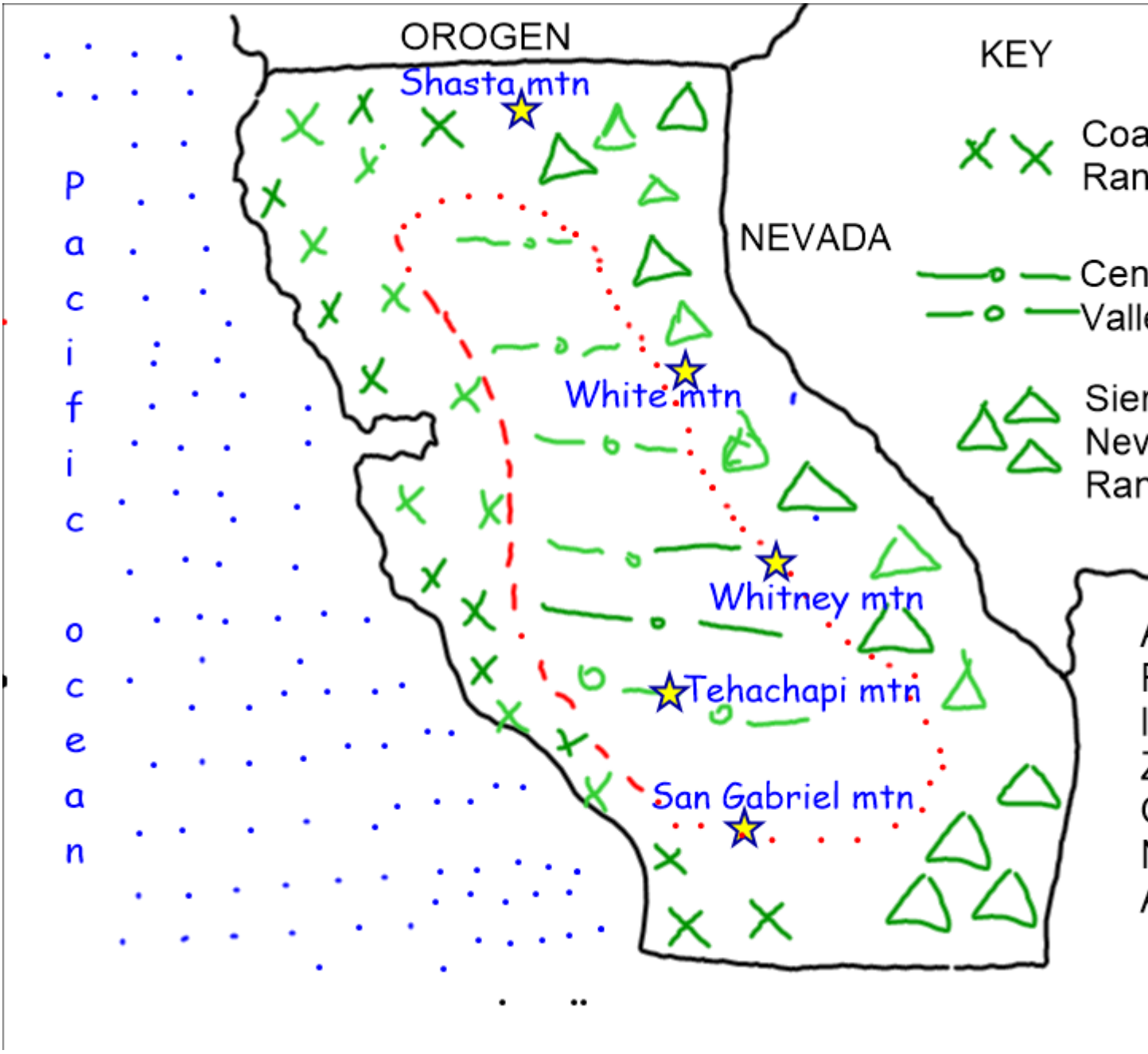
It is drained by 2 major rivers of Sacramento and San Joaquin and sub-rivers like Feather, Merced, Kern, Colorado, Eel, Klamath and lakes like

Mono, Owens, Havatsu, Honey plus the Salton sea among others



A sketch map of California showing relief


42
40
38
36
34
32
Latitude (degrees)
−124
−122
−120
−118
−116
−114
Longitude (degrees)
Shape corrected for lat 37.50
V 2.2 COPYRIGHT © 1995 by RAY STERNER, JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

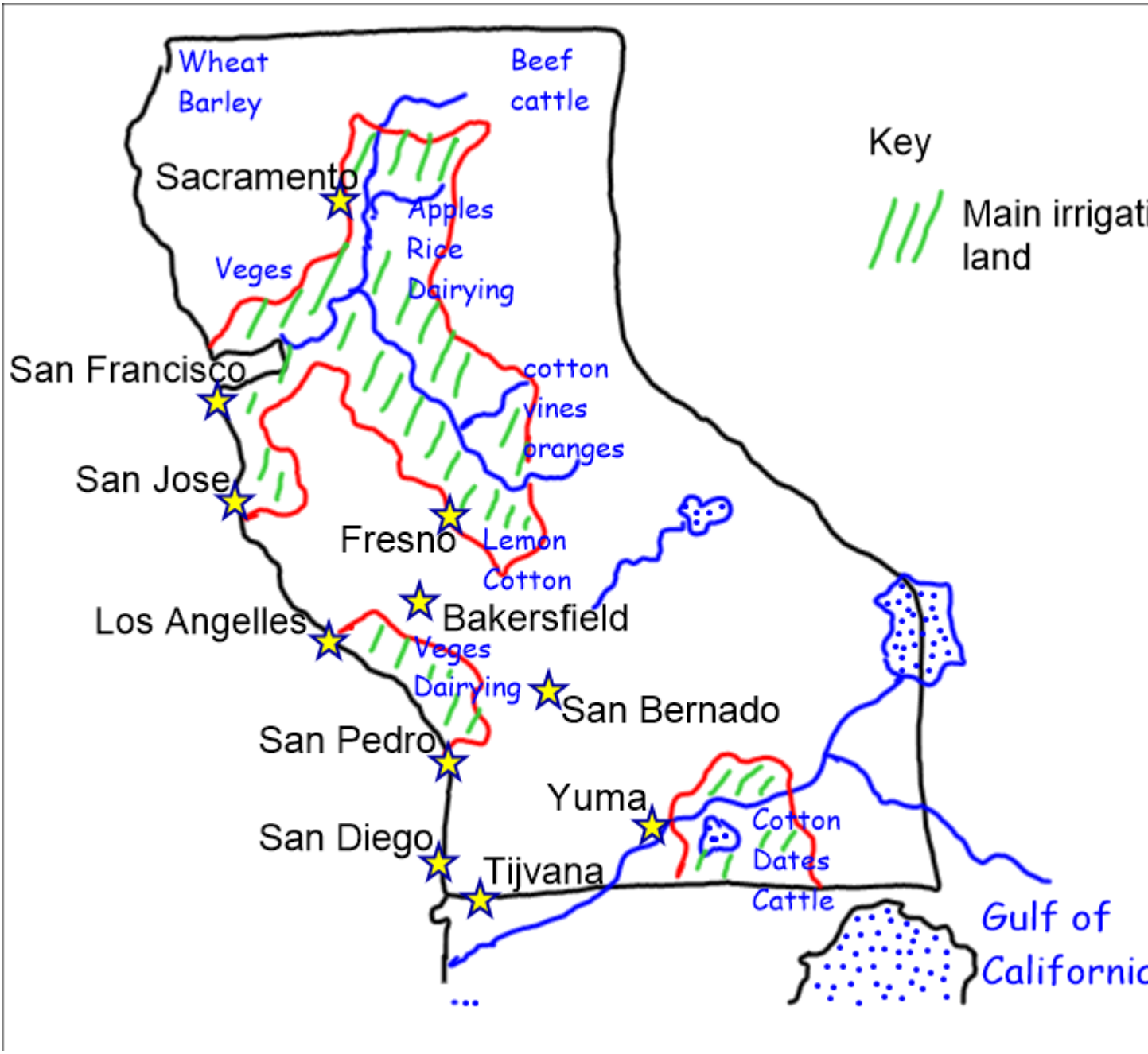


A sketch map of California showing drainage


Del Norte
Clear Lake Reservoir
Goose Lake
Klamath R.
Siskiyou
Modoc
Humboldt
Clair Engle Lake
Trinity R.
Pit R.
Shasta
Lassen
Shasta Lake
Eagle Lake
Trinity
Sacramento R.
Honey Lake
Lake Almanor
Tehama
Plumas
Eel R.
Lake Oroville
Butte
Feather R.
Sierra
Glenn
Mendocino
Nevada
Lake Tahoe
Colusa
Placer
Russian R.
Lake
Clear Lake
Sutter
Yuba
El Dorado
Sacramento
Sonoma
Yolo
Alpine
Napa
Amador
Mokelumne R.
Bodega Bay
Solano
Stanislaus R.
Mono Lake
Marin
San Joaquin
Calaveras
Tuolumne
Contra Costa
Mono
San Francisco
Alameda
Owens R.
San Mateo
San Stanislaus
Merced R.
Merced
Mariposa
Madera
Santa Clara
Santa Cruz
San Luis Reservoir
San Joaquin R.
Friant-Kern Canal
Kings R.
Monterey Bay
Fresno
Inyo
San Benito
Owens Lake
Tulare
Monterey
Salinas R.
Kings
San Luis Obispo
Kern R.
Buena Vista Lake
Kern
Santa Barbara
San Bernardino
Los Angeles
Lake Havasu
Ventura
Santa Barbara Channel
Riverside
San Pedro Channel
Orange
Coachella Canal
Salton Sea
Colorado R.
San Diego
Imperial
0
100 KM
100 Miles
© geology.com

Agriculture

Since the 1940's large areas of the Central valley have been transformed from unproductive semi-desert land into prosperous farming regions of the world. California has fine fertile soils and a warm sunny climate but has very low rainfall making irrigation absolutely necessary. The major economic activities include cultivation, livestock farming feeding on alfalfa fodder crops and poultry and over 85% of the total population is in the rural areas dealing in agriculture.



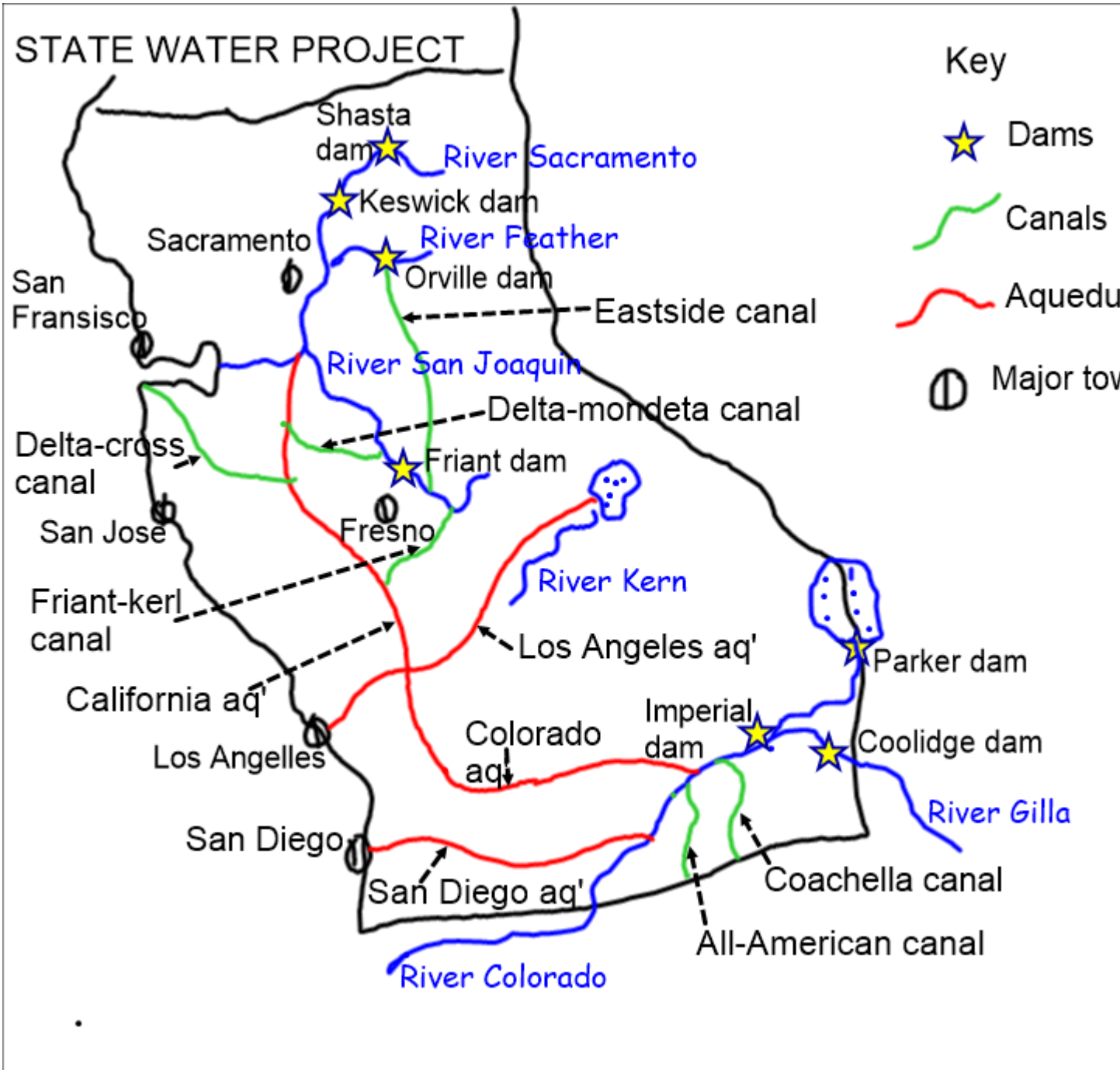
There are now 2 million hectares of irrigation land in the Central valley covering 60% of total farmland.

Canals and dams have been constructed to utilize valuable flood water that flows un-used to the Pacific each year like

Oroville, Friant-kerl, Shasta dams, California aqueduct, All-America canal, etc.

Irrigation Farming

In 1990 the State Water project was completed which increased total area of irrigation land. Commercial fruit and vegetable growing owe their success to irrigation such as citrus fruits, grapes and cotton. Other fruits grown include peaches, apricots, plums, almonds, raisins, oranges, lemons, tomatoes, lettuce, carrots, onions, dates, straw berries, etc. Vine yards cover valley floors and hill slopes of the Mediterranean part of the State accounting for 90% of America's wine and over ¼ of America's cotton comes from California in the lower South belt.



(A sketch map showing cultivable land)

Factors

- Flat and gently sloping land that favored gravity irrigation and mechanization
- Permanent rivers providing water for irrigation e.g. river Sanjoaquin and sacramento
- High technology used in pruning, harvesting and processing agro-products i.e. various machines.
- Availability of large sums of capital to buy farm inputs and irrigation gadgets.
- Desert climate with brilliant sunny summers conducive for fruit growth and ripening
- Fertile Alluvial soils from flooded water enabling fruit growth
- Large market for agro-products in California\USA and abroad.

- Efficient/developed transport and communication networks linking farmland to the market centers
- Limited pest and disease prevalence due to the dry climate
- Growing level of industrialization needing agro-raw materials

Problems

- Hostile environment in dry areas having dry summers and rainy winters
- Less moisture in the soil affecting crop growth
- High cost of maintaining dams and canals
- Dams trap silt limiting its deposition in the lower parts beyond the dams
- High evaporation of irrigation water causing salination of the soil

- Large tracts of the Central valley are unsuitable for irrigation
- High costs involved in supplying water in the farms
- Long distances to the market areas that causes delays in the transportation of fruits.
- Limited labor especially during the harvest time
- Weeds that compete with fruits/ crops for soil nutrients hence poor yields.
- Siltation of reservoirs and canals affecting water flow to irrigation land
- Presence of pests and diseases that destroy crops leading not only to low but also poor yields.
- Perishability of the farm produce especially the fruits

- Price fluctuation on the world market due to oversupply of agro-products affecting projected profits.
- Competition from other fruit growers like South Africa and Israel that limits their market potential.
- Occurrence of soil erosion and exhaustion of fertility
- Frost which limits proper growth of the crops and fruits
- Inadequate capital to invest in the project so as to cope up with world standard.

Solutions

- Creating co-operatives like Sunkist uniting farmers that helps in the marketing of fruits.
- Giant electric propellers that prevent frost at blossom/flowering time
- Large scale smudging i.e. heating air by burning oil inputs

- Re-circulating devices are used to prevent thick black smoke
- Concentrating in warm areas i.e. the thermal belts above valley floors
- Use of migrant labor especially from Mexico
- Introducing mechanization in the flat areas
- Use of fertilizers to improve soil fertility
- Bringing refrigerated vehicles for transporting fruits
- Dredging of the canals to clear silt and allow smooth flow of water
- Cloud seeding so as to induce rainfall in the dry seasons
- Irrigating more land to increase cultivable space
- Agricultural research to provide resistant crops

Importance

- Employment opportunities created e.g……..,……,……
- Economic co-operation between the California and other countries
- Foreign exchange is earned through export
- Improved standards of living due to income earning
- Infrastructure development linking farms and market centers
- More urban development like Sacramento, Fresno, Bakersfield, San Jose, Yuma, San Diego, etc
- Dense population in the area increasing market potential
- Government revenue through taxation and licensing

- International relations between California and other countries through trade
- Food supply for the good of the people
- Technological development in fruit growing for production of quality products

Diagrams showing some fruits grown in California

Pears
Plums

Apples

Peaches

Straw berries

Oranges

THE STATE WATER PROJECT

From the 1940's the desert land in the south and the central dry belt started undergoing transformation and by 1990 a State Water project was completed increasing irrigated land.

Today, low land California contains some of the world's most intensely farmed areas.

River San Joaquin holds the most irrigatable land yet with less water as compared to river Sacramento. The scheme was established to transfer water from the north to the south which receives low and unreliable rainfall.
Dams that were constructed include Shasta on Sacramento, Friant on San Joaquin, Hoover/Boulder on Kern, Orville on Feather, Parker on Colorado and
Canals include Coachella, All-America, Delta-Mondeta, Friant-kerl with
Aqueducts like Colorado, San Diego, Los Angeles and California.

Objectives

- To construct dams to control floods and hold water.
- To construct canals to transfer water from reservoirs to farms
- To dig channels to distribute water from canals to gardens

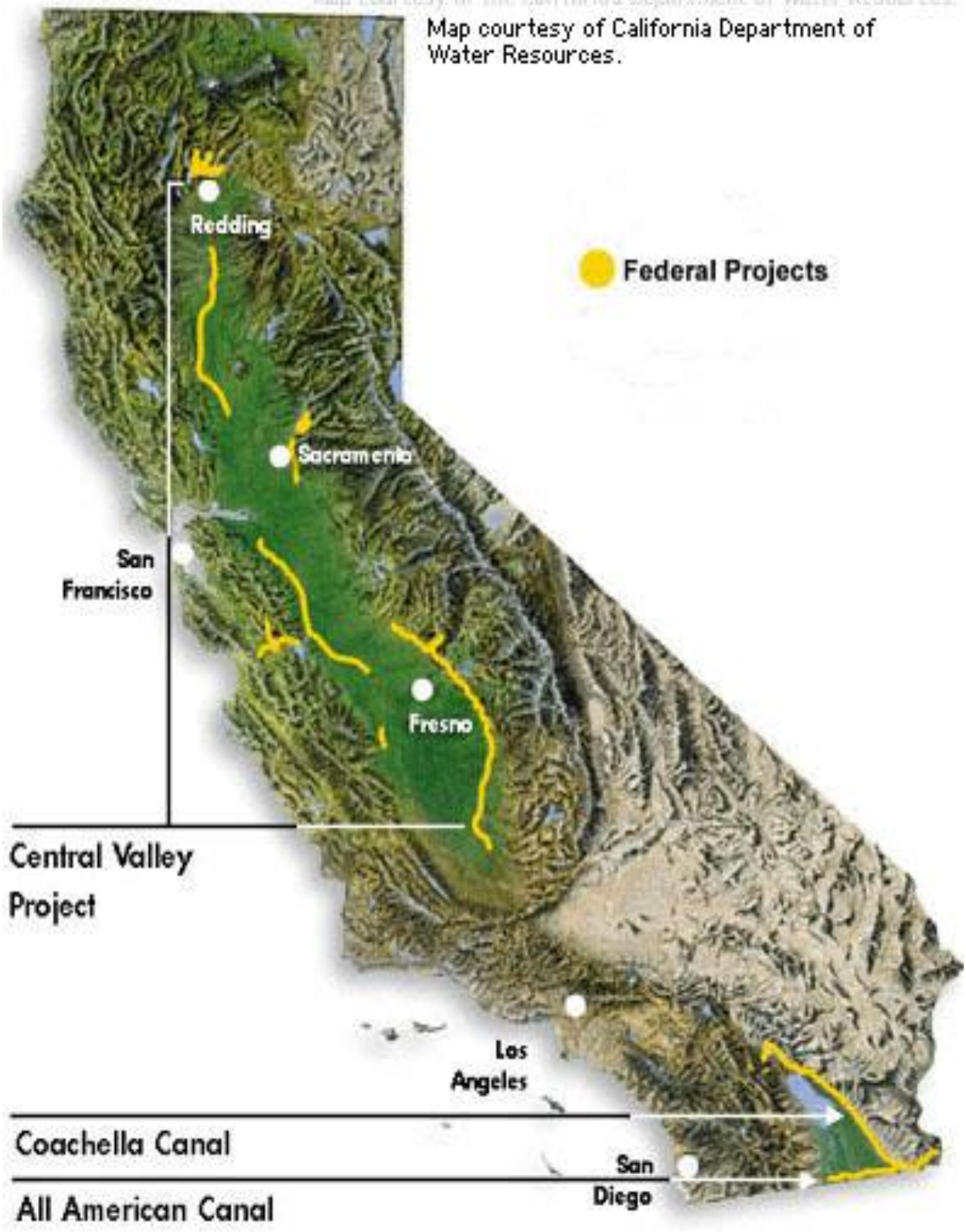
- To get water from underground

Factors

- The existence of high mountain ranges have lee-ward side effect hence dry lowlands.
- Winter and spring snow melts getting wasted into the sea.
- Presence of leveled surface for easy irrigation system.
- Long and deep gorged rivers for dam construction with hard foundation.
- Abundant capital to buy the required items.
- Supportive government policy to utilize arid areas.
- Abundant water from the Sacramento and San-Joaquin with an annual flow.
- Fertile desert soils in the Central and South areas needing water for productivity.
- Agricultural modernization in the area easing work.
- Skilled labor to man, the irrigation system and the farms.

A sketch map of California showing the State Water Project

A sketch map California showing major canals and aqueducts


Map courtesy of California Department of Water Resources.
Federal Projects
Redding
Sacramento
San Francisco
Fresno
Central Valley Project
Los Angeles
Coachella Canal
San Diego
All American Canal

Problems

- Water loss through evaporation during the hot summers.
- Salination where high temperatures bring salts to the surface.
- Water seepage into the lake beds and canals.
- Expensive to maintain the canals and acqueducts.
- Limited fresh water yet part of it is used to desalinate the land.
- Sacramento delta land has subsided below the sea level due to much water extracted from the river.
- Siltation of the dams and canals reducing water.
- Depletion of the underground supplies limiting the available water

Industrialization in California

Early developments in industry started with processing of farm, forest and fisheries products. However now manufacturing

industries produce the majority of goods and employ more people.
Other industries include oil refineries, aircraft making, food processing, engineering, chemical processing, aerospace engineering, textile industries, etc

The rise in California's industry dates back from the World War II when it acted as the main base for American military operations over Japan.
In 1942 a steel works industry was built at Fontana, east of Los Angeles using coal from Utah, iron ore from Eagle Mountain and some scraps as raw materials.

The aircraft industry has developed due to the strategic location, conducive arid climate and the Mojave/ Mohave desert offering ideal conditions for test-flying at all seasons (aerospace equipment now accounts for 1/3 of the state's industrial value).

The resent discovery of manganese nodules and other minerals on the sea bed has increased on the importance of industrial expansion in California.

SKETCH MAP SHOWING CALIFORNIA'S INDUSTRIAL CENTRES.

Factors

- Abundant raw material like manganese, coal, iron ore, rice, fruits, etc.
- Various power sources like oil and natural gas, HEP electricity at Shasta, Orville, Friant, etc.
- Developed transport and communication networks like roads, railway and air transport.
- Positive government policy of providing tax concessions/exemption, cheap industrial sites, etc.

- Adequate capital to buy industrial inputs both from government and foreign investors.
- Conducive climatic conditions of semi-arid nature with warm sunny conditions
- Cheap labor with a positive attitude both skilled and semi-skilled.
- Proximity/nearness to the international market via port San Francisco, Los Angeles, etc.
- Large market potential in the area due to the dense population
- Abundant water from the various rivers like Sacramento, San Joaquin, etc.

Importance

- Employment opportunities created for the managers,drivers,accountantants
- Economic co-operation between the California and other countries due to trade.
- Foreign exchange is earned through export of manufactured and agro products

- Improved standards of living due to income earned by the industrial workers.
- Development of transport and communication lines linking industrial towns to market centers like railways and roads.
- More urban development like Sacramento, Fresno, Bakersfield, San Jose, Yuma, San Diego, etc.
- Dense population in the area increasing market potential
- Government revenue through taxation and licensing.
- International relations between California and other countries through trade.
- Natural resource utilization for the good of the people.
- Technological development where now few raw materials are required for production of quality industrial products.

Problems facing Industrial development

- Congestion due to over concentration of industries
- Environmental pollution limiting clean raw materials i.e.water and air pollution.

- Competition from other industrial regions within USA, Canada and the outside world
- Exhaustion of natural resources/ raw materials due to over exploitation.
- Limited room for expansion due to increasing need for land by other economic activities
- High cost of production especially for the heavy industries like iron and steel
- High taxation by the government affecting projected profits

Tourism

California attracts over 16 million visitors each year with San Francisco as the most beautiful of America's cities having coastal settings, hilly streets, Victoria cable cars, etc.

Los Angeles is known for the movie industry particularly in Hollywood. Other centres like Anaheim, Disneyland, and Long

beach are attraction areas with hotels, museums, restaurants, the great ship are major tourist assets.

Climate, deserts, forests, mountains and beautiful beaches have made California a tourist country. Other activities include morning skiing on fresh snow, ocean surfing, etc with recreation centers like camp sites, huge parks, forests, etc.

Factors

- Various tourist potentials like beaches, coastal lands, etc
- Developed transport and communication networks e.g. the electronic railway, roads
- Positive government policy of relaxing immigration laws, etc
- Adequate capital to buy tourism gadgets like tracking devices, etc

- Conducive climatic conditions of Mediterranean nature with warm sunny areas
- Cheap labor with a positive attitude to work in different areas like beaches etc.
- Hospitality of the Californian people making tourists feel comfortable
- Proximity/nearness to an affluent international society which values vacations
- Large market potential with in the USA and outside
- Natural scenery with abundant fauna and flora
- Multi-lingual personnel attracting visitors
- Wide advertisement of the tourism potentials attracting many visitors.

Importance

- Employment opportunities created e.g. tour guides, truck drivers, and hotel managers.
- Co-operation between California and other states and countries was improved
- Foreign exchange is earned from the tourists
- Improved standards of living due to income earning by the workers.
- Infrastructure development linking up tourist centres e.g.roads,railways
- Urban development like Disneyland, San Pedro, Beverley Hills, Pomona, San Fernando, Santa Monica, etc
- Dense population in the area increasing market potential
- Government revenue through taxation of tour companies, hotels, tourist sites.

- Natural resource utilization and conservation for the good of the present and the future generation
- Culture preservation of California

Problems facing the Tourism sector

- Congestion during the summer season causing destruction of fauna and flora
- Terror threats that limit the number of tourists into the country
- Competition from other tourist destinations like New York within USA,Great wall in China, Pharaoh pyramids in Egypt, hanging gardens of Babylon in Iraq and other parts of the world.
- Exhaustion or extinction of natural resources like animals and plants due to illegal poaching, encroachment by man, etc

- Limited room for expansion due to increasing need for land to settle on and practice other economic activities
- High cost of constructing tourist sites and maintaining them to keep the international standards
- High taxation by the government leading to hiking of tourist fees which discourage both local and foreign tourists thus affecting projected profits
- Remoteness of some tourist sites and potentials that limits access hence fetching less income
- Occurrence of natural hazards like tsunamis, earthquakes, floods, etc. that destroy natural beauty and potentials

Filming industry

Los Angeles is famous for movie making at Hollywood and Anaheim, Disneyland acting as offshoots of the filming industry.
Hollywood is the patent film industry in the world.

Factors

- Arid climate provides sunshine for clear pictures
- Varied relief features like mountains, flatlands, etc
- Availability of capital to buy state-of-the-art gadgets
- Mild climate which favors outdoor activities all-year round
- Varied vegetation like forests in the north and shrubs in the central
- Large market for films in California and the outside world

- Skilled labor to man the industry and match with the changing tastes of the viewers
- Diverse drainage giving luxuriant scenery for captions e.g. rivers and lakes.
- Advanced technology used to get captions in space, on the ground and under water with ease
- Political stability in the region
- Improved transport and communication networks easing near and distant filming

Importance

- Employment opportunities created e.g. film actors, managers, videographers etc.
- Economic co-operation between California and others was improved

- Foreign exchange is earned through export of films
- Improved standards of living due to income earned by the workers
- Infrastructure development linking filming centres to filming industries, e.g. roads and airports.
- Urbanization in California like Disneyland, Anaheim, Hollywood.
- Dense population in the area increasing market potential
- Government revenue through taxation of filming industries
- International relations between California and other countries through trade
- Natural resource utilization and conservation for the good of the people

Problems facing Filming industry

- Pirating of films on the internet reducing on the projected profits.
- Environmental pollution and destruction limiting good filming sites
- Competition from other filming regions or companies like Nollywood in Nigeria, Ugawood in Uganda, Bollywood in India, and others in China, Korea, Ghana, South Africa, Tanzania that reduces the market potential.
- Life threatening scenes that sometimes cause death of the actors/ actresses
- Limited room for expansion due to increasing need for land by other economic activities
- High cost of production especially for the science fiction movies, war movies, series, etc

- High taxation by the government affecting projected profits

Urbanization

Los Angeles

It is California's major industrial area, economic capital of the Pacific and South west region and US's 2nd largest city with over 10 million people. It is situated in a dry region hence water supply is a problem.

Factors

- Sunny climate attracting settlement
- Petroleum industries that attracted other industries and people
- Film making in the area that made it famous
- Centre for processing and distributing fruits and vegetables

- Presence of defense and aerospace industries
- Water supply from rivers like Colorado
- Positive government policy to utilize the semi-desert land
- Good landscape for settlement, industrial development and communication network development
- Strategic location next to the Pacific ocean and affluent societies of Japan, China, Russia, etc
- Transport and communication networks in the area like Santa Anna free way, San Diego free way, San Bernardino free way, air ports

A sketch map of Los Angeles town


MAPQUEST
Green Valley
Palmdale
El Mirage
Llano
Victorville
10mi
10km
Castaic
Val Verde Park
Santa Clarita
Angeles San Gabriel Mountains Natl. For.
Phelan
Hesperia
Wrightwood
Santa Paula
Moorpark
Simi Valley
Oxnard
Thousand Oaks
Burbank
Glendale
Glendora
Rialto
Beverly Hills
Los Angeles
Pomona
Santa Monica
Inglewood
Riverside
Chino
Whittier
Fullerton
Corona
Manhattan Beach
Torrance
Rancho Palos Verdes
Long Beach
Huntington Beach
Santa Ana
Costa Mesa
Wildomar
Laguna Beach
Dana Point
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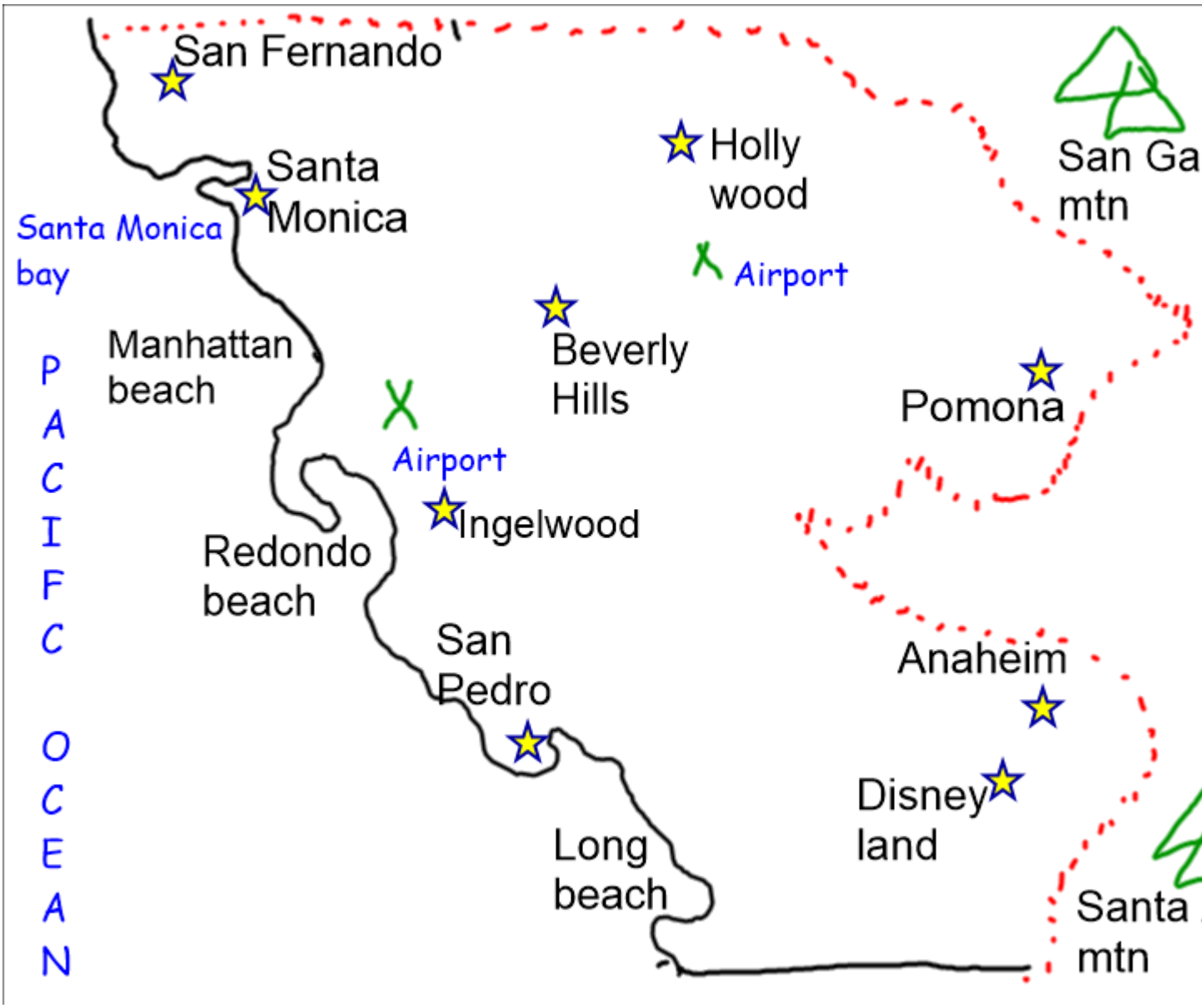


Problems

- Traffic congestion in the peak hours
- Water shortage due to the semi-desert conditions
- Occurrence of smog- i.e. smoke from oil refineries
- Exposure to health hazards from pollution
- Over population causing shortage of land and other social services
- Limited accommodation for the people

NEW ENGLAND

This refers to the northeast states of USA made up of six i.e. Maine, Vermont, New Hampshire, Connecticut, Rhode Island and Massachusetts.

It is bordered by New York in the west, Canada in the north, Atlantic ocean in the east and Long Island found in the south.

New England was officially sanctioned on 3rd-nov-1620 when the charter of the Virginia Company of Plymouth was replaced by a royal charter for the Plymouth Council for New England, a joint-stock company established to colonize and govern the region.
It was originally occupied by the Red Indians who were displaced by the European immigrants in the areas of thick forests, poor stony soils and long harsh winters.
New England covers an area of 186,458.2 sq.km with a population of 14,429,720 people having a density of 87.7 /sq.km.

As the US expanded westwards, many Yankees left their homes in search for better agricultural land and wider opportunities.
Traditional industries declined with time mainly due to increased power demands, outdated machinery, high rental costs and high wage rates for the workers.

Fortunately the second half of the 20th century has been a revival of New England fortunes mainly due to the rise in technology-based industries in the south of the region and the development of leisure areas in the north.

Sketch map showing New England states

Climate

It is generally humid continental with short mild summers and long cold winter. Rainfall ranges from 1000- 1500 mm though the north has 500- 1000 mm with heavy winter snow.

Temperatures fall up to -46°C at Bloomfield in Vermont.

However the coastal areas have Sub-tropical climate.

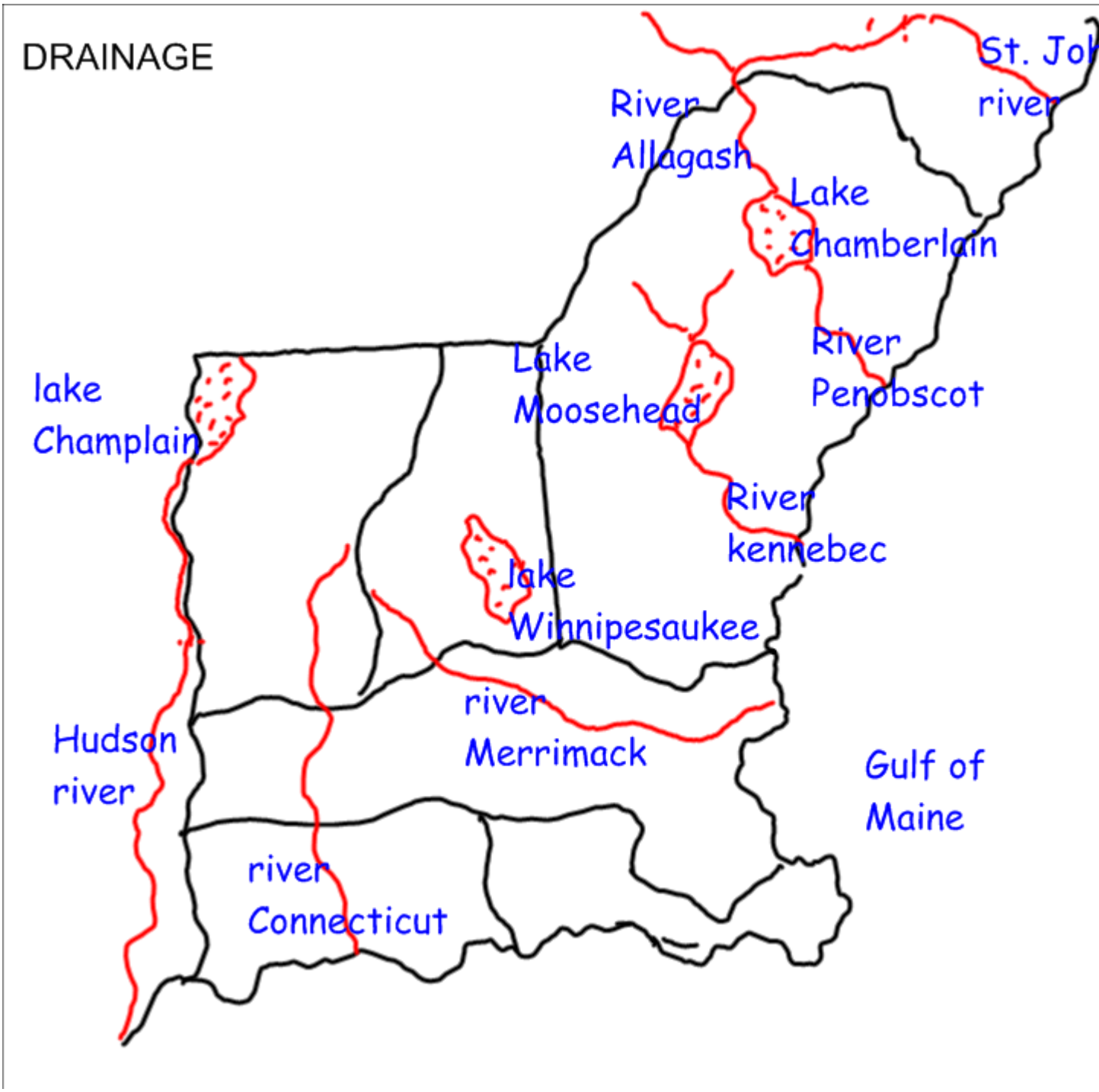
Drainage

- Connecticut river flowing from the Appalachian mountains in Vermont through Massachusetts and Connecticut into the Atlantic ocean
- Merrimack river flowing from the Appalachian mountains through Massachusetts to the Gulf of Maine into the Atlantic ocean.
- St. John river flowing from the Appalachian mountains into the Atlantic ocean
- Kennebec river flowing into lake Moosehead in Maine
- Allagash river flowing from the Appalachian into lake Chamberlain
- Penobscot river flowing from lake Chamberlain into the Atlantic ocean

There exists many lakes such as

- Chamberlain and Moosehead in Maine
- Champlain between Vermont and New York
- Winnipesaukee in New Hampshire

(Sketchmap showing drainage)



Relief

Much of the region lies between 100- 300 m above sea level and has quite a rugged landscape.

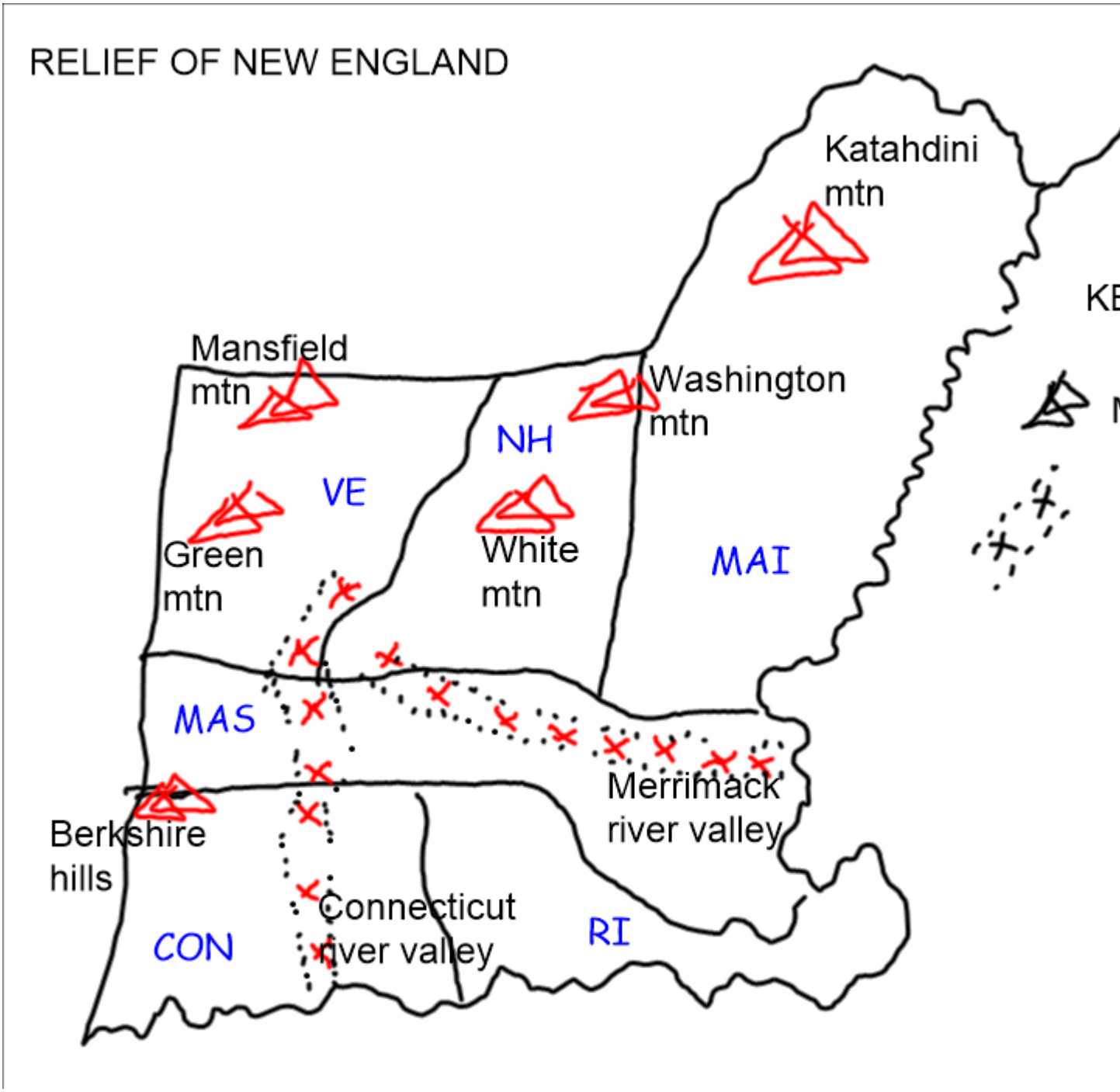
- New England's rolling hills, mountains and jugged coastline are glacial landforms resulting from the retreat of ice sheets approximately 18000 years ago, during the last glacial period. The coast from southwest Connecticut to northeast Maine is dotted with lakes, swamps, hills,

sandy beaches and far coastal plains or major river valleys are littered with glacial boulders and sand.

- In the west and north the ridges and peaks of the Appalachians form a mountain area with mountain Washington rising to almost 2000m. Further inland are the Appalachian mountains extending through Connecticut, Massachusetts, Vermont, New Hampshire and Maine with mountains like mount Washington and White mount in New Hampshire, Green mount and Mansfield in Vermont, mount Katahdin in Maine, Berkshire hills in west Massachusetts and Connecticut and valleys of Connecticut river valley and Merrimack river valley.

Sketch map of New England showing relief, drainage, etc


Québec
Sherbrooke
Madawaska
Fort Kent
Van Buren
Caribou
Fort Fairfield
Presque Isle
Mars Hill
NEW BRUNSW
Houlton
Fréder
MAINE
Mt Katahdin
5267
Millinocket
Mattawamkeag
Vanceboro
Moosehead Lake
Chamberlain Lake
Jackman
Greenville
Lincoln
Calais
Dover-Foxcroft
Dexter
Eastport
Newport
Orono
Bangor
Machias
Ellsworth
Skowhegan
Bucksport
Bar Harbor
Mt Desert I
Belfast
Waterville
Augusta
Rumford
Rockland
Penobscot Bay
Newport
St Albans
Lake Champlain
Mt Mansfield
4393
Lancaster
Berlin
St Johnsbury
Littleton
Mt Washington
6288
White Mts
Burlington
Auburn
Lewiston
Bath
Montpelier
Barre
Conway
Brunswick
VERMONT
Westbrook
Portland
Middlebury
Lake Winnipesaukee
Hanover
Lebanon
Biddeford
Saco
Rutland
Laconia
Franklin
NEW HAMPSHIRE
Rochester
Green Mts
Windsor
Claremont
Concord
Dover
Portsmouth
Springfield
Bellows Falls
Manchester
Exeter
Saratoga Springs
Keene
Haverhill
Lawrence
Cape Ann
Gloucester
Bennington
Brattleboro
Nashua
North Adams
Fitchburg
Lowell
Salem
Troy
Mt Greylock
Cambridge
Boston
Greenfield
MASSACHUSETTS
Pittsfield
Worcester
Quincy
Newton
Provincetown
Northampton
Holyoke
Brockton
Cape Cod Bay
Cape Cod
Hudson
Westfield
Springfield
Taunton
Pawtucket
Providence
Hyannis
CONNECTICUT
Fall River
Hartford
Warwick
New Bedford
Kingston
New Britain
Nantucket Sound
Torrington
RI
Newport
Nantucket I
Waterbury
Norwich
New London
Martha's Vineyard
Newburgh
Danbury
New Haven
Block I
Bridgeport
Montauk Pt
Montauk
Norwalk
Stamford
LONG ISLAND
Yonkers



Industry

Today, New England is one of the most industrialized regions with new industries replacing the old ones like, fire arms industry, woolen industry, shoe making and leather making industry, ship building industry, textile industry, producing electric machinery, transport equipments, clocks/ watches, fire arms/ammunition, office machinery, ball and roller bearings, turbines, chemical, etc

- Boston- producing electronics, computers, office machinery, printing and publishing, textiles, communication equipment, etc
- New Bedford- making sporting goods, textile, rubber products, photographic equipment, footwear, food processing, etc
- Hartford- making aerospace equipments, industrial machines, fire arms, etc
- Holyoke- making textiles, paper and printing, electrical machinery, metals, chemicals, etc
- Burlington- making electronic equipment, steel and wood items, maple syrup, textile, business machinery, etc

Factors

- Phasing out of old industries
- Abundant electricity i.e. Hydro electricity power
- Decline in agriculture that prompted manufacturing industries to come up.
- Abundant cheap/ skilled labor to work in the industries.
- Large market for the manufactured goods within New England and abroad.
- Adequate capital to buy industrial equipment.
- Developed transport and communication to transport raw materials and finished products to the market centres.
- Extensive land where to set up industries
- Abundant water for cooling machines and as a raw material from rivers Connecticut and others.
- Prevailing political stability that attracted investors.

Importance

- Employment opportunities to the people as managers, machine operators.
- Foreign exchange through export of industrial products to England, Japan and China.
- Skill acquisition of the workers in operating machines, management.
- Improved living conditions due to the income earned by the workers.
- Development of infrastructure e.g. roads, hospitals
- Urbanization like Boston with its added advantage like large market.
- Revenue to the government through taxation and licensing of industries and the workers.

Problems faced

- High labor costs that leads to low returns.
- Competition for raw materials that delays the production process.
- Competition for market that limits the expected profits.
- Congestion in the area and along the transport routes that delays work.
- Transport problems caused by the Appalachian mountains

Steps taken

- Relocating of the industries to reduce on congestion.
- Improved technology of using few raw materials so as to reduce on the competition for raw materials.
- Market research for produce
- Use of capital intensive techniques

Agriculture

Though industrialization has grown, agriculture still plays a significant role in the economy of the New England states growing hay, sweet corn, tobacco, potatoes, maple sugar, blue berries, cranberries, yams, etc

Sketch map showing agricultural patterns

Fruit growing

*Hartford

*Providence

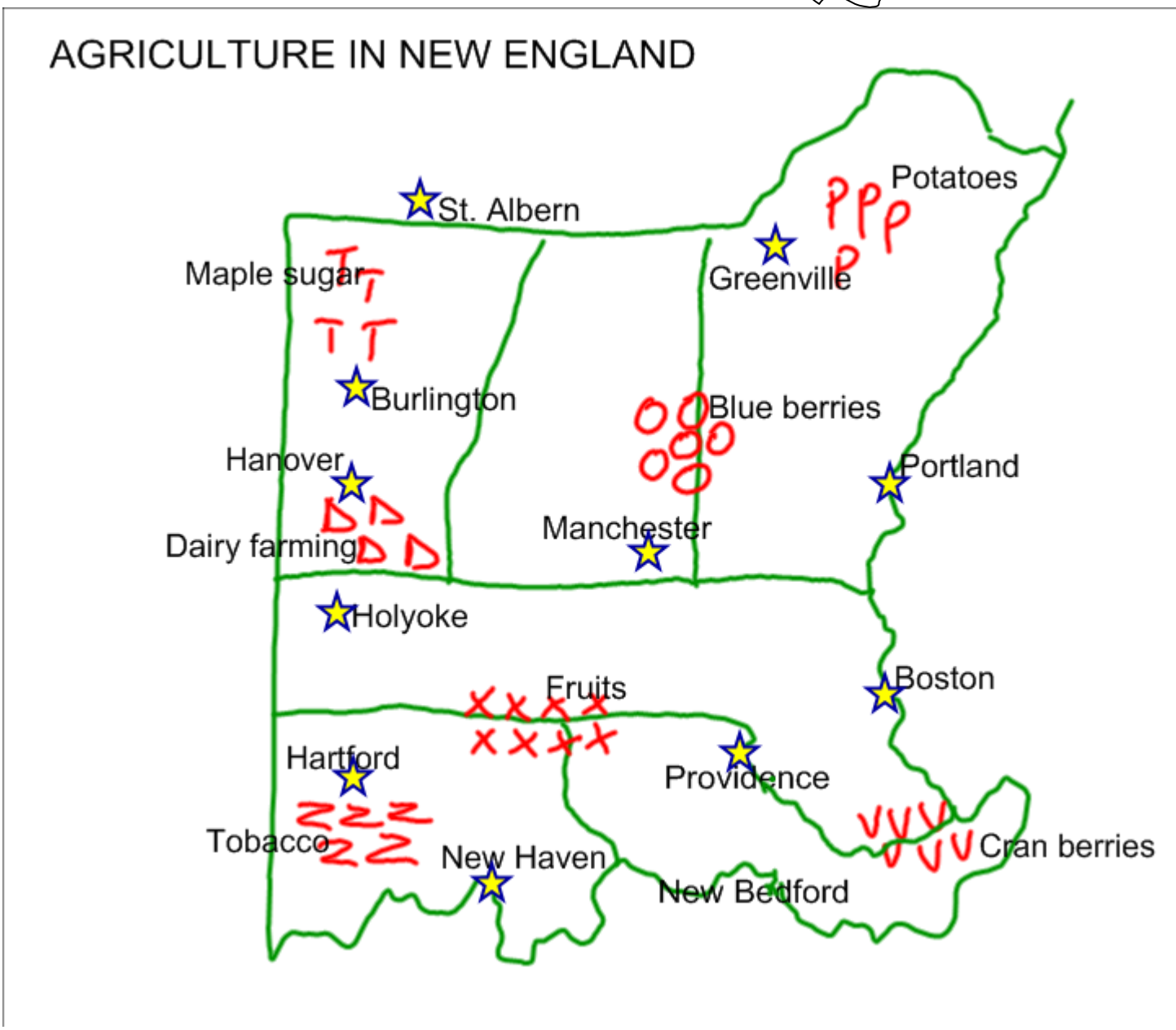
Cranberri

Tobacco

*New Bedford

*New Haven

Nantucket's bank



Factors

- Well drained fertile soils
- Abundant rainfall
- Warm summers for ripening
- Skilled labor to work on the farms
- Large market in USA and abroad
- High level of technology that ensures quality
- Agricultural research that leads to continuous improvement in production.
- Supportive government policy of allowing farmers to carry on with the activity

Importance

- Food to the people
- Provision of raw materials for industries
- Employment to the people like farm managers.
- Economic diversification from industry to agriculture.
- Income to the farmers hence improved standards of living.
- Foreign exchange through export of agricultural products to England and Japan.
- Government revenue through taxation and licenses.
- Infrastructure development e.g. roads, railways
- Urbanization like Manchester, Portland, Providence, etc
- Market for industrial goods such as farm inputs

Problems faced

- Poor soils like in Maine and New Hampshire having rocks
- Short growing season due to severe winter hence less production.
- Hard wood forests not easy to clear and that delays farm activities.
- Price fluctuation on the world market affecting the expected returns
- Rugged mountainous relief affecting mechanization
- Presence of pests and diseases that reduces the farm products.
- Competition from more fertile regions like north and south Dakota
- Constant use of fertilizers that pollute the soil hence reducing the output

- Shortage of labor that causes delay in farm activities and affects production.
- Limited capital to purchase farm inputs and other equipment.

Steps taken

- Soil conservation like mulching
- Regulated fertilizer use
- Contour ploughing on the steep slopes to reduce soil erosion.
- Agricultural research and specialization
- Green house farming during winter
- Improvement in transport and communication.
- Improved storage and preservation
- Encouraging mechanization to reduce on the effect of labor shortage

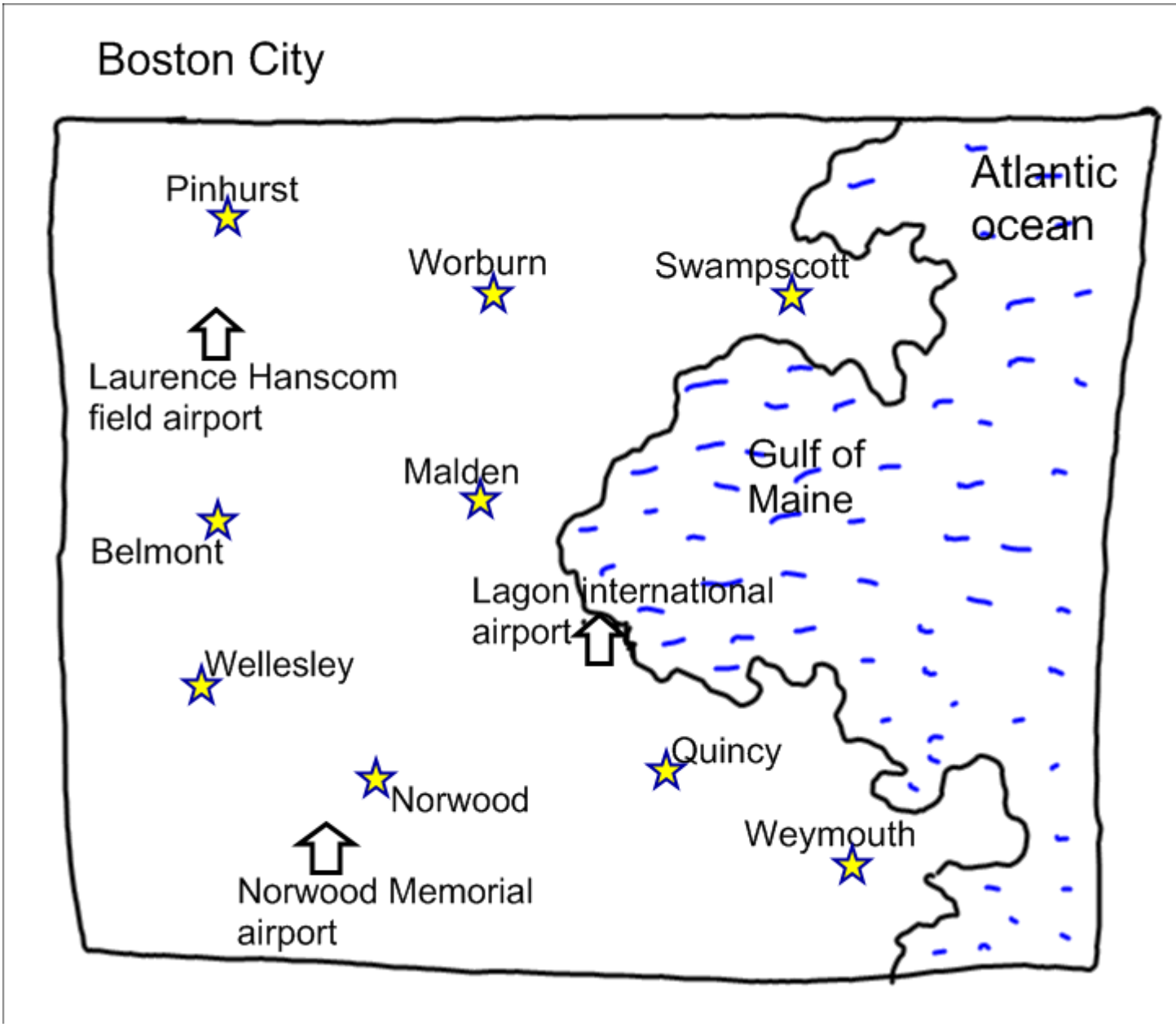
Urbanization

Boston

It is the capital of Massachusetts (and regional capital of the New England region) and one of the leading industrial centres in the region making fire arms, clocks, aero-engines, electrical equipment, computers and a great fishing port.

Sketch map of Boston City


PINEHURST
READING
PEABODY
SALEM
BURLINGTON
225
3
38
93
95
129
107
Laurence G. Hanscom Field
WOBURN
SWAMPSCOTT
Nahant Bay
95
LEXINGTON
3
1
MALDEN
16
2
BELMONT
B O S T O N
20
Logan International Airport
ATLANTIC OCEAN
90
28
9
WELLESLEY
93
HULL
Quincy Bay
Hingham Bay
Weymouth Back
NEEDHAM
DEDHAM
QUINCY
109
138
28
53
WEYMOUTH
NORWOOD
BRAINTREE
3
228
Norwood Memorial Airport
95



Functions

- Administrative centre of Massachusetts and regional capital
- Commercial centre
- Tourist center
- Residential and social centre

Factors

- Strategic location
- Early European settlement
- Industrial development
- Efficient transport and communication network
- Prevailing peace and stability
- Supportive government policy
- Abundant water supply from Merrimack and Atlantic
- Shielded from strong winds by the extended land of Rhode island.

Problems faced

- Severe winter
- High crime
- Limited land for expansion
- Congestion of traffic and people
- Environmental pollution
- Unemployment
- Flooding caused by tsunamis, Catarina's, etc

GLORY BE TO GOD IN THE HIGHEST