

## **Food and Water Security Course Module 2: Water Security Management of Water Systems for Food and Ecosystems? Video Transcript**

In the coming years, climate change will impact the agriculture sector in British Columbia in a range of different ways. According to the CAI Website, Agricultural producers are accustomed to weather conditions influencing their activities. Decision-making in the face of weather variation, and a range of other challenges, is a constant element of farming life. However, climate change is anticipated to bring a different scope and scale of change from that previously experienced.

Agriculture is highly vulnerable to changes in climatic conditions. Longer term shifts may be more manageable than the unpredictable weather events that are expected to increase in frequency, but even small shifts could have significant consequences for food production and the livelihoods of farmers.

Climate change adaptation is the response – of individuals, groups, or governments – to these anticipated changes. Adaptation is intended to strengthen resilience in a way that minimizes risks, reduces vulnerabilities, and enables the realization of opportunities associated with climate change.

To formulate effective adaptation strategies for BC agriculture, a practical first step is to assess the potential impacts of climate change. Identifying both risks and opportunities as well as realistic and practical adaptation measures will improve the resilience of agricultural production in a changing climate.

The Adaptation Risk & Opportunity Assessment reports provide a good starting point for understanding climate impacts on various production systems in specific regions of BC. The Farm Practices & Climate Change Adaptation research project studied the potential for six on-farm practices to reduce risk or increase resilience in a changing climate. The Regional Adaptation Strategies are regional-level plans that delve more deeply into the highest priorities for producers and outline strategies and actions for adaptation. These are being developed as part of the Regional Adaptation Program.

Some of the overall impacts of climate change for BC agriculture have been identified as follows:

- More frequent occurrence and severity of summer drought; water shortages in more regions
- Decreased snowfall in alpine areas leading to reduced snowpack and water shortages
- Increased precipitation (frequently through more extreme events) and subsequent vulnerability to flooding, erosion and nutrient loss



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- More frequent and intense extreme weather events (windstorms, forest fires, hail, droughts, and floods)
- Increase in growing degree days (heat units) and a longer frost free season, leading to a potential for broader range of viable crops in some regions
- Increase in pest and disease pressure due to winter survival

The geographic scope of the Okanagan Adaptation Strategies includes the Regional District of North Okanagan (RDNO), the Regional District of Central Okanagan (RDCO) and the Regional District of Okanagan-Similkameen (RDOS). This area is located between the Columbia and Cascade mountain ranges in south-central British Columbia and covers a total area of 20,822 square kilometres. Within these three regional districts there are sixteen municipalities and fifteen electoral areas. There are also eight member communities of the Okanagan Nation Alliance. The combined population of the RDNO, RDCO and RDOS is 341,818. The Okanagan region contains the largest concentration of population in the province's interior (7.8% of BC's total population).

The Okanagan region has a warm growing season with high accumulations of growing-degree days and sunshine-hours, as well as relatively mild winters and springs characterized by long frost-free periods.<sup>7</sup> The Okanagan region lies in the rain shadow of the Coast and Cascade mountains, creating a hot, sunny, dry climate that is classified as semi-arid, with the lowest average (annual) precipitation in southern Canada.<sup>8</sup>

Precipitation in the Okanagan region ranges from an average of 250 mm per annum in the drier, southern part of the region to 400 mm per annum in the northern part of the region and at higher elevations.<sup>9,10</sup> In general, it is cooler and the growing season is shorter in the northern part of the region.<sup>11</sup> The lack of adequate growing season precipitation in some parts of the region (in particular at the lowest elevations) is the major climatic limitation for agriculture. Irrigation is required for most production, with the exception of limited early season pasture and forage crops.<sup>12</sup>

Soil types and agricultural capability vary across the region and by elevation.<sup>13</sup> It is estimated that there are 31,160 hectares (77,000 acres) of arable land in the Okanagan Basin.<sup>14</sup> The majority of agricultural land is adjacent to Okanagan Lake and some of its tributaries. There are also portions of the Agricultural Land Reserve (ALR) to the north of Okanagan Lake and surrounding Princeton.<sup>15</sup> Five major soil groups exist within the Okanagan Basin.<sup>16</sup> There are widespread differences in soil types throughout the Basin; the southern part of the Basin has deep sandy soils, whereas the northern area around Kelowna is mainly composed of clay and gravel.<sup>17</sup> Unimproved soils are Class 4 or 5 due to aridity and topography, but soils can be improved to Class 1, 2 or 3 depending on the severity of limitations.<sup>18</sup>



In addition to region's climatic and environmental advantages, the Okanagan region is located in proximity to large markets and has well developed transportation infrastructure and educational and research institutions. Linkages between tourism and agriculture are strong in the region. Direct farm gate sales to visitors are an important source of income for some operations, along with other diversification opportunities afforded by agri-tourism.<sup>19</sup> The Okanagan region contributed 12% of total provincial gross farm receipts in 2010, generating over \$355 million.<sup>20</sup> In 2011, there were 10,740 farm workers employed in the Okanagan; this was 24% of the provincial total of agriculture sector employees, working on only 3.6% of the province's Agricultural Land Reserve.<sup>21</sup>

Land prices are high in the Okanagan region, largely due to the rate of residential development. The high price of farmland limits expansion, renovation, and investment in farming.<sup>22</sup> However, opportunities do exist for entrants from other locations around the globe with similar land prices.<sup>23</sup> Up until recently, the wine grape industry has continued to attract new entrants but has struggled to secure qualified labour.<sup>24</sup>

The Regional District of Central Okanagan (2005) and the Regional District of North Okanagan (2015) have both completed Agriculture Area Plans and have Agricultural Advisory Committees (AAC) in place to guide plan implementation, and to review land use applications and other planning decisions that may affect agriculture. Many regional district member municipalities have also completed agriculture plans and established AACs.

The three regional districts had partnered on various initiatives before jointly contributing to this plan. RDNO, RDCO and RDOS are currently partnering on the Okanagan Kootenay Sterile Insect Release Program,<sup>25</sup> and each region is represented on the Okanagan Basin Water Board. Starting in 2015, the three regional districts began a project to identify, monitor and evaluate common indicators pertaining to their Regional Growth Strategies.<sup>26</sup> The regional districts also contributed to the Ministry of Agriculture Agricultural Land Use Inventory (ALUI), which has been used as input for the Agriculture Water Demand Model for the Okanagan Basin (AWDM). The AWDM is used to determine current and future water demands for agriculture in the region.<sup>27</sup>

There is a long history of agricultural research in the Okanagan, with tree fruit breeding and variety trials underway as early as 1914.<sup>28</sup> Research facilities in the region include: the (AAFC) Summerland Research and Development Centre, UBC Okanagan and Okanagan College.<sup>29</sup> The Okanagan Basin Water Board and the Okanagan Water Stewardship Council are spearheading research around water resources and management. A number of commodity-specific industry associations and organizations representing members' interests are based in the Okanagan. These groups provide a broad range of services for their members, including marketing, research and informational resources, and program delivery.



Only 8.5% (176,692 hectares) of the Okanagan region's overall area is included in the Agricultural Land Reserve.<sup>31</sup> There are 3,693 farms in the region (19% of farms in BC) and the average age of producers is 56.<sup>32</sup> The agriculture industry grew steadily in the Okanagan between 2001 and 2011. The total amount of land farmed in 2011 was 199,765 hectares, an increase of 10,699 hectares from 2006, and an increase of 26,224 hectares from 2001.<sup>33</sup> The average farm size in the Okanagan is 54 hectares, significantly lower than the province-wide average of 132 hectares.<sup>34</sup> 53% of the farms in the Okanagan are under four hectares.<sup>35</sup> The type of agricultural production is not uniform across the Okanagan region. In the northern areas, forage, dairy and cattle ranching are common, while tree-fruit, grape and vegetable production dominate the central and southern areas.<sup>36</sup> Today, 90% of BC's apples, 89% of BC's grapes and 85% of BC's cherries are grown in the south-central Okanagan. In recent years there has been a steady shift away from many types of tree fruit (apples, pears, peaches, plums and apricots), largely due to challenges with profitability.<sup>37</sup> However, in the summer of 2015 the BC Fruit Growers' Association reported a very slight expansion of acreage devoted to apple growing in the Okanagan (after decades of decline).<sup>38</sup> Also, the land in sweet cherry production has increased substantially, from 781 hectares in 2001 to 1,429 hectares in 2011.<sup>39</sup>

As some types of tree fruit production have been shrinking, acreage has been shifting into wine grapes and there are now almost 3,491 hectares in grape production across the region.<sup>40</sup> In the Regional District of Central Okanagan alone, the period between 1991 and 2006 saw a 346% increase in land devoted to grape production.<sup>41</sup> Much of the conversion from orchard to vineyard has been concentrated in the southern portion of the region.<sup>42</sup> Today the Okanagan is one of the largest producers of fruit and wine in Canada.<sup>43</sup>

The north Okanagan has a well-established dairy industry, and its poultry production has also grown in recent years. Field crops, particularly alfalfa but also barley and tame hay/fodder crops are predominant in the north Okanagan, with 17% of the provincial total acreage of winter wheat and 20% of the provincial acreage of forage corn grown in the RDNO.<sup>44</sup> The Okanagan region as a whole contributes significantly to organic production in the province across a range of crops, including fruits, vegetables and greenhouse products. Thirty-nine percent of the province's certified organic farms are located across the three regional districts (with 26% of the province's certified organic farms located in the RDOS). There is also apiculture, greenhouse and nursery production, vegetable and melon farming and sheep/lamb production in the Okanagan region. Many of these production types have experienced growth over the last decade.<sup>45</sup>

A local Advisory Committee for the Okanagan region was formed to provide input throughout the project. This Committee included participants from the three regional districts in the Okanagan, the BC Ministry of Agriculture, Agriculture and Agri-Food Canada (AAFC) and a number of agricultural organizations. The agricultural producer participants volunteered their time throughout the project, representing five distinct local production systems. The regional district partners provided staff time and expertise and covered costs associated with the



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workshops. With funding from Growing Forward 2, the BC Agriculture & Food Climate Action Initiative provided core management and human resources for project delivery.



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