

# *Liverpool Plains*

## EVOLUTIONARY LANDSCAPE

MOTHER NATURE MAKES A PERFECT LANDSCAPE FOR A FOOD BOWL

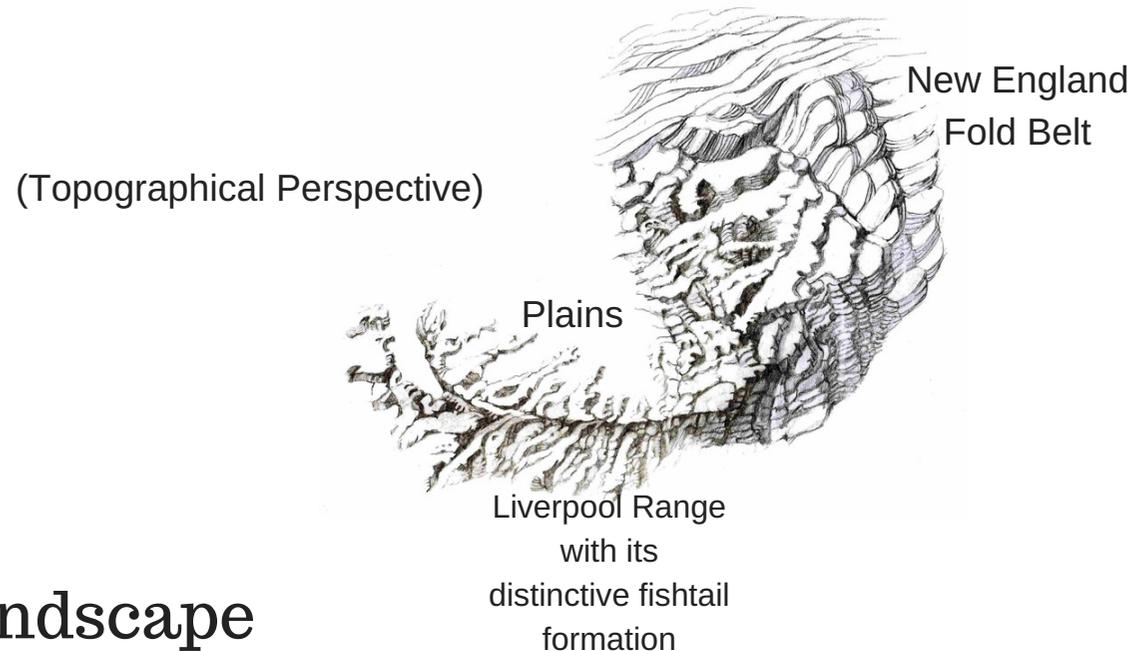




Liverpool Plains is 5 hours north-west of Sydney

# The Liverpool Plains Landscape

This is an ancient landscape Shaped over millions of years through an evolutionary process of erosion and deposition to evolve from a basin to a dynamic seedbed. Understanding how this complex nurturing environment came into existence puts the concepts one associates with this landscape into perspective...alluvial plain, deep and shallow aquifers, coal deposits, landforms - rivers, islands, mountains.



## Structure of the Landscape

Today the plain is hugged by 2 mountain ranges to the east is the ancient New England Fold Belt, which is part of the Great Dividing Range, and to the south is the more recently formed Liverpool Range (the distinctive fish tail formation), which created a dynamic change in the landscape. These ranges are responsible for the underlying structure, and the dynamic seedbed, which consists of two very different types of material - bedrock and alluvium.

# Blue Print of the Landscape

The bedrock (shaded in yellow) is the firm rock underneath the alluvium. It is mainly basalt, sandstone and shale, and at depth, the coal with its toxic deep aquifers. The alluvium (shaded in coloured bands) is the loose material above the bedrock that incorporates the prized shallow aquifers.



# Geological Time

## 1. Formation of the New England Fold Belt

**400-300 million years** - Rocks formed and folded up into a mountain range called the New England Fold Belt.

**260 million years onwards** - The New England Fold Belt deposited eroded sediment to the west and north- west into what was then just a basin, to shape the Gunnedah Basin Formation.

## Bedrock Formation

Sediments converted to sedimentary rocks (shales and sandstones) as they are buried and compacted, becoming the bedrock (1). Large peat swamps were buried and converted into coal. Old aquifers now exist in coal and in the sedimentary rock, but they are, saline, acidic, and contaminated with heavy metal sediments, and of no value for water supply.

**150-50 million years** Uplift of the basin triggers valley cutting into the Gunnedah Basin sedimentary rocks. So there are now valleys and hills in the surface of the Gunnedah basin (2). Over time water cuts down valleys to about 100m below the present floodplain (3).



(1)



(2)



(3)

## 2. Formation of the Liverpool Range

**40-35 million years** (age of the basalts) A dynamic change in the landscape is marked by a major turnaround. Multiple volcanic eruptions formed an entire mountain range known as the Liverpool Range, creating a new drainage divide.

The basalts flowed North West down the valleys of the Gunnedah Basin. The newly formed Liverpool Range blocked the headwaters of the old valleys. The shorter, smaller rivers north, still flowed NW. The rivers south of it, were turned south towards the sea, via the Hunter River. The sediment washed off the newly formed range builds upon the stream's floodplains and fills the valleys between the hills with clays from basalt and sand from sandstone to form the modern plains. The valleys are no longer deep and narrow where fast flowing rivers can move sediment quickly through landscape, but rather a slower flatter horizon means slow moving water deposits sediment over the landscape.



The underlying structure now cradles the plains like an outstretched hand forming the most beautiful seedbed! (as in our unit logo)

**4. 5 million years – present** So the process of erosion and deposition continues off sedimentary and local basalt outcrops. In the Gunnedah Basin, the valleys begin to also fill with new sediment from the hills around them via alluvial and colluvial fans. Sandy sediments from the folds in the Fold Belt rocks, and black fertile clay sediments from the Liverpool Range basalts, form the broad alluvial deposits of the Liverpool Plains.

**Today**, we have a very distinctive landscape (below) surrounded by mountains on two sides and vast plains with protruding hills, islands and ridges of bedrock of sedimentary rock (sandstone, granite) or local basalt. Tops of old bedrock rise above the sandy and clayey sediment.



Artist's version of a topographical map of today's landscape