

## 基于时间序列—动态神经网络吹填土沉降预测研究

王蕊颖<sup>①</sup>, 王清<sup>①</sup>, 张颖<sup>②</sup>, 项良俊<sup>①</sup>

① 吉林大学建设工程学院 长春 130026;

② 辽宁有色勘察研究院 沈阳 110013

## TIME SERIES-DYNAMIC NEURAL NETWORK FORECAST ON DREDGER FILL SETTLEMENT

WANG Ruiying<sup>①</sup>, WANG Qing<sup>①</sup>, ZHANG Ying<sup>②</sup>, XIANG Liangjun<sup>①</sup>

① College of Construction Engineering of Jilin University, Changchun 130026;

② Liaoning Nonferrous Research Institute, Shenyang 110013

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**摘要** 吹填土围海造陆技术能有效缓解土地资源紧张的问题,所以提高此项技术水平刻不容缓。但是吹填土中,黏粒含量高,有机质含量高,含水率和压缩性大,强度低,导致固结效率低,沉降速度慢。进行长期沉降观测需要耗费较多的资源,故大部分工程并不进行观测。吹填土土体表面形成硬壳的时间一般需要耗费2~3a之久,工期长,加固效果不理想,工后实际沉降与预期沉降相差很大。因此,为工程达到规定变形的要求,如何结合沉降的观测数据进行长期沉降量的预测,以及针对预测得到沉降量,对吹填土采用哪种处理方式成为我们亟待解决的问题。本文通过自编程序建立了时间序列—动态神经网络的非线性方法,并将其运用于吹填土沉降的预测中并分析结果。结果表明,动态神经网络的方法可较为合理准确的运用于软土的固结沉降预测中,误差小,可行性强,预测结果具有较高的精度和稳定性。

**关键词:** 吹填土 沉降预测 时间序列 神经网络

**Abstract:** Reclamation through technology of dredger fill can relieve the problem of short earth resources effectively. So it is urgent to improve this technology. Dredger fill has a high content of clay, organic and moisture, high compressibility and low strength, which cause the characteristic of low consolidation efficiency and slow settling velocity for the reclaimed land. For most of the projects, long-term settlement observation has been omitted due to the big requirement of resources. It usually takes 2-3 years to form the hard mantle layer on the surface of dredger fill. Such duration is too long. The effect is not ideal. Furthermore, there is a big difference between the actual settlement after construction and the expected one. In order to satisfy the deformation requirements, the problems of the prediction of long-term settlement based on the observation data of short-term settlement have to be addressed. In addition, the method that can be taken based on the long-term settlement prediction needs to be solved. The time series-dynamic neural network is established through self programming in this article. This method is applied in the prediction of long-term settlement and the analysis of results in Dredger Fill. The results show that the method of dynamic neural network can be reasonably applied to the prediction of soft soil consolidation settlement with minor error and better feasibility. The prediction has high precision and stability.

**Key words:** Dredger fill Settlement prediction Time series Neural network

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作者简介: 王蕊颖,女,主要从事岩土工程方面的研究.Email: ruiying.wang@yahoo.cn

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